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MARCH 1998
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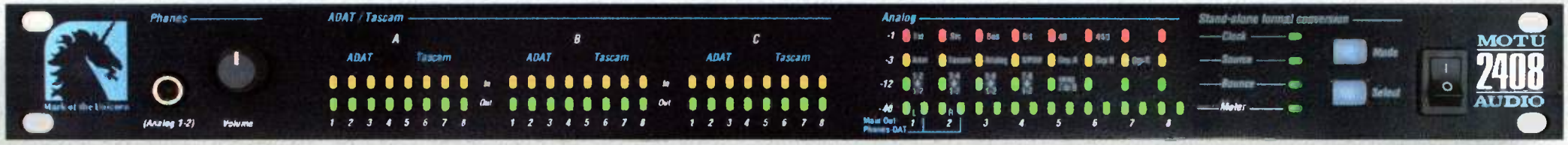

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leader

Last month's leader warned of the dangers of manufacturers using the Internet as a substitute for proper product support, but it can also play a very positive role by providing added value to something you may have just bought in your local music shop.

According to major service centres, a high proportion of the keyboard instruments and effects units returned for service still have the original factory sounds loaded into their user memories, which suggests that a great many end-users buy instruments on the strength of the sounds packaged with them. Buying extra sounds on RAM or ROM cards is very expensive, yet a number of manufacturers have sounds to give away for free, and still relatively few people take advantage of the fact.

I spoke about this to the marketing manager of a leading synthesizer manufacturer recently, and was told that they'd actually tried an incentive where they provided a huge range of product support software on CD-ROM, that dealers could copy and then pass onto customers for a nominal handling charge. However, many dealers were reluctant to take the trouble to do this. It seems the only place information can be made available without it costing a fortune in time and money is on the Internet. Though many musicians aren't yet on-line, I would imagine that most people have a a friend who is, and providing you know exactly where to look on the net, the data you need can be retrieved relatively painlessly.

Most of the leading synth manufacturers have editing software, support documentation and free patches, just waiting for you to download them, and if it's true that an instrument is only as good as its factory patches, then having access to new patches is like getting a new instrument for free. I'd go so far as to say that if I was thinking of buying a new synth, I'd check up with the manufacturer or distributor to find out exactly what free support was available, because to my mind, this added value has a significant bearing on the actual worth of the product. I might even go so far as to say I'd think twice about buying anything where further free patches were not available, because although creating your own sounds should be encouraged, not everybody has the time or the expertise to do it from scratch.

Because wandering around the net can be painfully slow, call the tech support department for the product you're interested in and get the relevant Internet site addresses before you start. Some manufacturers put their web site address at the bottom of their ads, so look there first. If you're determined not to use the Internet, check to see if your dealer will get the data for you. I still feel that confining product support to the Internet is a bit of a cop-out, but when it comes to getting something for nothing, it takes some beating!

Paul White *Editor*

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168
Korg N5 Music Synthesizer

REVIEWS

22 **Preview: Yamaha's New 1998 Range**

36 **Danish Pro Audio 4060 Mic**

38 **KRK Rokit Nearfield Monitors**

40 **ElectroVoice RE500 Capacitor Mic**

42 **FAT Resinator Filter**

69 **Prosoniq Sonicworx Macintosh Editing Software**

74 **MOTU Digital Performer v2.11 Macintosh Sequencer**

84 **Smart Research C2 Compressor**

86 **Drawmer MX40 Quad Gate**

94 **Spectral Audio Syntrack Synth Module**

122 **Terratec EWS64 XL PC Soundcard**

132 **DAL V8 PC Recording System**

156 **Viscount Gammaverb Reverb**

168 **Korg N5 Music Synthesizer**

180 **Akai DPS12 Digital Personal Studio**

208 **JBL 6208 Reference Monitors**

222 **MIDIMan Flying Cow Converter**

224 **Roland A70 Controller Keyboard**

246 **Inward Connections Vac Rac Valve Processors**

264 **Brief Encounters:** *Lovetone Wobulator Effects Pedal, Hammond Organ Book Review*

WIN TL AUDIO IVORY VOICE PROCESSOR p266

Volume 13 Issue 5 March 1998

in this issue

FEATURES

44 Karl Bartos: Electric Music

176 Giorgio Moroder

198 Debbie Wiseman

268 Retrozone: Korg S3 Rhythm Workstation

SOUND WORKSHOPS

152 Song Construction & Arrangement Part 4

160 Effective Drum Programming Part 2

190 Practical Studio Soundproofing Part 2

212 All About Patchbays

238 The Why & When Of Processors Part 6

Computer notes

Apple Notes.....252
PC Notes.....254
Atari Notes.....258

REGULARS

4 Crosstalk

8 Shape Of Things To Come

18 News From NAMM 1998

234 Sample Shop

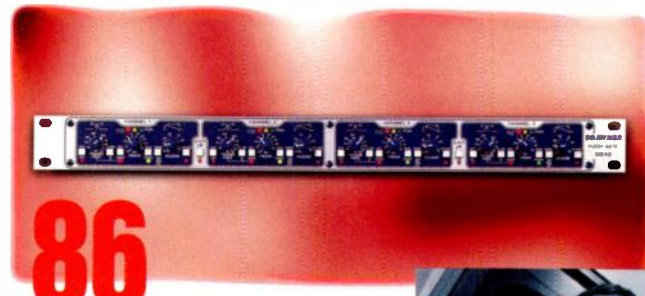
260 Demo Doctor

272 Free Ads

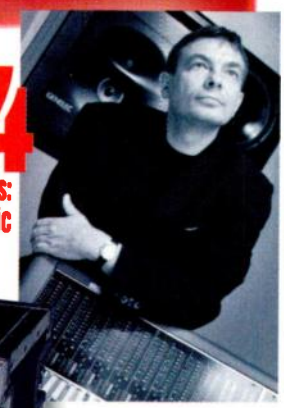
280 Mail Order: Books, Videos, CDs

284 Classified Ads

304 Sounding Off



86 Drawmer MX40 Quad Gate



44 Karl Bartos: Electric Music

246 Inward Connections Vac Rac

38 KRK Rokit Monitors

42 FAT Resinator

PC MUSICIAN

MIDI, Audio & PC Plug-ins p100

Soundcard Roundup: Multi-channel cards p140

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Akai Answers

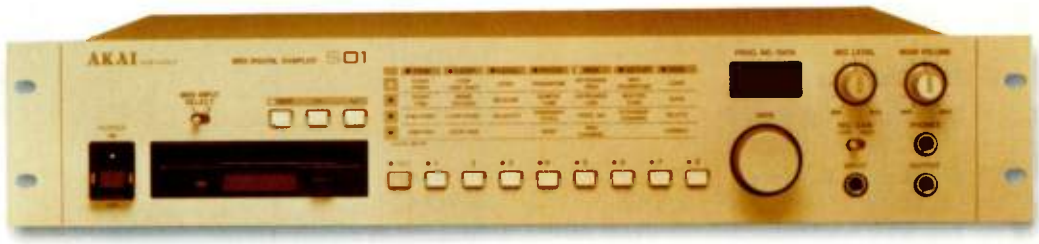
I am currently looking for a second-hand sampler, and have come across Akai's S01 and S900, which are both within my price range. But as I know little about them, I don't know which one to buy. Could you give me any info that might help?
David Wager
Gwynedd

Derek Johnson replies: *There are a couple of fundamental differences between these two Akai samplers. Most significant is that the S900 is a 12-bit sampler, while the S01 is a 16-bit machine. The S900 is also a lot older, though it was Akai's top-line machine when it came out in 1986; the S01 was an entry-level sampler from day one, offering bags of memory but basic sample manipulation tools. Because of this, it's tricky to effectively compare their relative specs.*

The S900 was Akai's first sampler to feature a 3.5-inch disk drive (the earlier S612, S700 and X7000 keyboard all utilised fiddly 2.8-inch Quick Disks), so that's a bonus. It offers sample rates of between 40kHz (where you'll have only 12 seconds to play with) and a crunchy 4kHz (but with 48 seconds of sample time). You can't add more sample memory. It's 8-note polyphonic, and holds 32 samples and 32 programs (patches). Sample manipulation facilities include a low-pass filter, two envelope generators, and an LFO. There's a mix output, plus eight individual outs (a special socket is also provided for connecting the S900 to an Akai AX73 or VX90 synth, for extra processing). There was also an optional drum trigger board.

The S01 was a breakthrough in 1992, when a 16-bit sampler for under £700 was really something to write home about! As standard, it offers 1Mb of memory, a fixed sampling rate (32kHz), a sampling time of 15.625 seconds (expandable to 31.25 seconds with an optional 1Mb memory board), eight sample slots and 8-voice polyphony. Not only is the S01 a doddle to use, it's compatible with S1000 and S1100 sample libraries (although with only eight sample slots, you're never going to have huge multisampled patches).

Which one you go for is up to you: you can have high fidelity and ease of use, but a limited feature set with the S01, or 10-year old 12-bit audio and much more in the way of sound manglement with the S900. If you want to do a little research, the S900 was reviewed in July 1986; we looked at it again in October 1987 (when we appraised the machine's v2 software). The S01 was reviewed in November 1992. ❑



Chip Service

I was surprised and confused by Martin Walker's 'Chips with Everything' article in your January issue. I had planned to upgrade my PC using the AMD K6 233 processor and Asus TX97 motherboard. Previous articles had implied that this range of processors was suitable for music applications, as it has floating point architecture, unlike the Cyrix range. I use *Cakewalk Pro audio*, *Cool Edit* and a Turtle Beach Pinnacle sound card. My current machine has the Cyrix 586-100, and though I can occasionally get four tracks of audio, real-time effects processing is completely out, and quite often the machine hangs. I don't want to waste money on buying the wrong chip and if I can avoid it I don't want to upgrade to Pentium 2, as I'd need a new ATX case, 168-pin RAM, motherboard and processor.

My basis for concern is Martin Walker's recent enthusiasm for Intel. This seems to be entirely founded on Seer Systems' web page results. I talked to a friend in the industry, and he suggested that these results could be caused by the use of an Intel motherboard, as AMDs are known to run slower on these boards. As the PC is becoming the centre of a number of musicians' studios, I think it's about time *SOS* did their own research on the subject and published some comparative results using music software as benchmarks.
Geoff Drucquer
via email

Martin Walker replies: *I'm sorry if you were confused by my recommendation to stick with Intel processors in 'Chips with Everything'. This was not based solely on the Seer Systems figures, but on a distillation of technical discussions with various developers and designers employed by the major sequencer and soundcard manufacturers, as well the tests I've personally carried out during the past year. If I can get hold of a K6 chip (they were released after my PC speed tests published in the August '97 issue) I'll do some additional measurements. However, as I'm sure you've noticed, SOS already carries more specific support for PC musicians than any other music technology magazine.*

I doubt that Seer's results were solely due to using Intel motherboards, and I included the figures only to illustrate one example of a program that does use MMX-specific features. The problem is that music software uses a completely different mix of processor features than most other applications. The consensus seems to be that AMD's K6 processors have a faster general performance than the equivalent clock speed of Intel Pentium MMX, but a slower FPU (Floating Point Unit) performance. Since most games and mainstream applications seldom need to use the FPU, the benchmark tests nearly always show the AMD K6 as faster. However, the Seer results show what happens in an extreme case where lots of floating-point calculations are needed — if you extrapolate their figures to compare a Pentium MMX 233MHz directly with the K6 233MHz, the Pentium will be about 50% faster!

As I say, this is an extreme case, and different music software functions may be faster with a K6. It's a swings and roundabout situation. As you rightfully say, nobody wants to waste money buying the wrong chip, but the bottom line is this: all music software is written for Intel processors, and most figures published to date indicate that the AMD K6 range will probably work well, but will sometimes be significantly slower than the Pentium range. If you search out SOS advertisers who sell complete PC systems for musicians, you'll see that they all supply Intel Pentium processors. The final factor is that as I write this (early January) the Intel 233MHz MMX processor is selling for only £20-30 more than the AMD K6 233MHz. On this basis, I stand by my recommendation. ❑

20

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Express Action

Recently I upgraded my studio with the purchase of a Mark of the Unicorn MIDI Express XT MIDI interface, to accompany my new PC running Steinberg's *Cubase 3.0* and Soundscape. On installing the software for the XT, I ran into some difficulties. After installing the hardware driver, you have to restart the PC before installing the rest of the software, and that is when my computer indicates that it's having a problem. Maybe somebody can advise me, because I can't figure it out, and most of the people I know use Macs. When restarting the PC after installing the driver I get the following message: "Msgsrv caused a general protection fault in module MMSYSTEM.DLL". I get this message only when my XT unit is switched on. When I leave it switched off and restart the PC, everything goes well. It will ask for the XT to be switched on, but doing so will obviously cause the aforementioned problem. The software version supplied with my XT-unit is V1.01 for the console, and V1.00 for the driver.

Rob van Schoonderwalt
The Netherlands

Martin Greenwood, of UK MOTU distributor MusicTrack, replies: *MOTU PC interfaces require IRQ 7 by default. Check in the Device Manager: if anything is appearing on IRQ 7 before installing the MOTU driver, this will stop the driver from being installed properly. Once you've established that IRQ 7 is free (remembering to restart the PC if you've had to remove a driver), if you still have problems the next most likely cause is the setup for the LTP1 port. The settings for this port are accessed via the BIOS setup page — hold down the Delete key at startup, and this should take you straight to the BIOS settings. In the BIOS Features setup, the LTP1 port should be set to SPP. This configures the port to be a bi-directional port and you should then be able to install the driver. The* Console *software that ships with the XT is* not *required for the interface to work.*

PC users should also be made aware of the limitations caused by a bug in Windows 95 that limits the number of MIDI ports that can be installed on the PC to 11. The MIDI Express XT installs nine drivers, one for each In/Out on the XT and one for 'Out All'. If your PC already has soundcards installed, with, say, three MIDI sockets, this will exceed the limit of 11 and the system will hang. There is no workaround for this problem; Microsoft have been aware of it for some time now but have not done anything about it. Also, some soundcards are Plug and Play, and when you remove the driver to make way for the XT drivers, the Windows OS sees that there is a card with no driver and promptly reinstalls it for you. The only way around this is to physically remove the card from the PC. You may also be able to turn off the MIDI for such cards (the FM synth set is a favourite to turn off).

Microsoft have said they will fix this bug, but so far all they have done is to put in place a splash screen that comes up if you try to install networked MIDI Timepiece AVs. If you attempt to do this, a warning tells you that it cannot be done, giving the option to disable all of the ports that would take it over the limit, and admitting that this is a Microsoft problem which should not be referred to Mark of the Unicorn. (Sadly, nobody seems to have read it!).

The last thing you could try is in the Driver settings: 'Allow Unterminated SysEx' should be un-checked. This kind of SysEx is specifically for Casio synths, so if you don't have one, turn it off. However, this is not a major point and will not stop the XT from working. ❑

Rack For Good

I enjoyed Bill Bruce's Alan Wilder interview in the January issue of *SOS*, and wondered if you could help with a small enquiry. Do you know where Alan gets his equipment racks from? The ones pictured on page 161 and page 162 look great. From what I know of Alan, and having seen the pictures of his fabulous studio, he probably has them custom-built, but I thought it was worth asking.

John Fryer
London

Matt Bell replies: *Good news, John; a quick call to Bill Bruce enabled us to find the manufacturer — and far from the expensive custom-built racking you might have expected, Alan uses standard modular piping, of the kind used to make children's climbing frames, screwed together with an Allen key. He bought his from Kee Systems Ltd, of Thornsett Road, London SW18 4EW (Tel: 0181 874 6566, fax 0181 874 5726). Prices are therefore not as fearful as you might have thought: standard 27mm-diameter tubing costs around £3 a metre, and the corner locking pieces cost around £4 each. If you want a sturdier constuction, 34mm-diameter tubing is also available, at just under £4.50 a metre (prices given include VAT). Kee Systems will cut tubing to fit your size requirements, and can also supply the piping in a range of colours, although apparently the lustrous green sheen visible on Alan's racks is nothing more than a coat of Hammerite he applied himself! The only remaining thing to note is that Kee do not supply the fixings necessary to fit rack gear onto the tubing, or flight cases for outboard; they only sell the piping and its associated connecting pieces. Thanks to Bill Bruce (and of course Alan Wilder himself) for the info!* ❑

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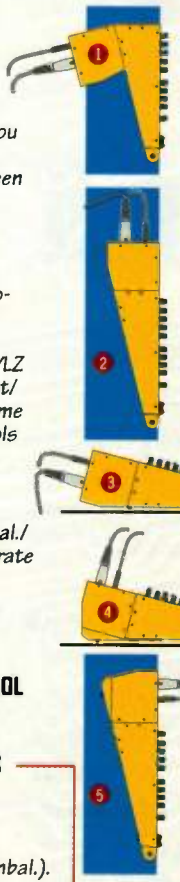

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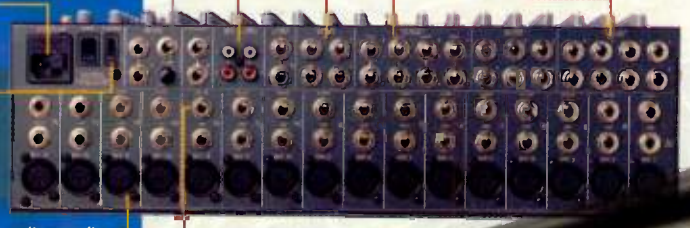

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shape of things to come

by Derek Johnson

Super Freak

Kenton Electronics are launching a new product: the Control Freak is equipped with eight programmable faders and eight programmable buttons, and has been designed to allow live, real-time editing of MIDI parameters. It can be used to edit synth and sound module parameters, adjust sequencer controllers, or create versatile lighting effects — all in real time. Each slider or button may generate controller information, SysEx, notes, program change, pitch-bend or aftertouch, allowing instant control of up to 16 parameters. A hundred user profiles are provided, in addition to preset profiles for most popular synths. The price is expected to be in the vicinity of £200, but contact Kenton for further details.

Kenton have also updated their Pro 2000 2-channel MIDI-CV converter (reviewed in *SOS* June 1997) with a major software revision. The most significant change is that the Pro 2000 no longer restricts itself to controlling two synths at once: each of the six LFO-controllable auxiliary outputs can now be used as CV and gate outs, allowing the unit to control up to six antique synths at one time. In addition, a special 'Trigger' mode is provided for ARP 2600 synths and the like. The update may be installed by the user, and is supplied with easy-to-follow instructions. Alternatively, Kenton can fit the new EPROM for visitors to their premises.

A Kenton Electronics, 12 Tolworth Rise South, Surbiton, Surrey KT5. 9NN.
T 0181 337 0333.
F 0181 330 1060.
E sales@kenton.co.uk
W www.kenton.co.uk

Bragg seized by the Spirit

Mixer manufacturers Spirit are sponsoring a series of gigs at London's 12 Bar Club. The first of the so-called Spirit Nights featured Billy Bragg performing a two-hour set featuring the work of Woody Guthrie. The gig was recorded for a soon-to-be-released Cooking Vinyl promo CD using a Spirit LX7 desk. Spirit Nights will continue throughout 1998, with major names playing solo; unsigned acts will have a chance to play support slots.

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

Roland on a roll

Roland have been storing up plenty of new products for 1998, with the first official announcements being made at the recent NAMM show in LA (see the NAMM report starting on page 18). First of all, there are two new digital recorders: the entry-level VS840 (£949) and the top-of-the-line VS1680 (£2199). The clue is in the numbers, with the VS840 offering eight audio tracks, four of which can be recorded at once, and the VS1680 doubling those figures. In addition, the VS840 offers 64 'Virtual Tracks', two on-board multi-effects processors, a removable Zip drive (which the original VS880 didn't have), and optional SCSI. Like the VS880 before it, the VS840 uses compression tricks to get the most out of your recording medium; a single Zip cartridge will hold between 37 and 103 minutes of music, depending on recording mode and sample rate.

Roland VS1680.

Above: Roland MC505.

Below: Roland SP808.

The VS1680 recorder/mixer combo features a 26-channel automated digital mixer, 256 virtual tracks, non-destructive editing, automated digital mixing (including effects and EQ), and options for CD recording and up to two multi-effects processors (each with four independent stereo effects). SCSI is standard and, depending on recording mode, total recording time is between 404 and 1616 track minutes, using the installed 2Gb hard drive. A prime feature of this new machine will be its large angled display (see photo left).

We've already exclusively revealed details of

Go for a Pro

HHB have announced an affordable professional DAT machine from Sony. At £799 including VAT, the PCM R300 is equipped with a full selection of pro features for little more than some domestic DATs. The machine lets you record at all three sampling rates (32kHz, 44.1kHz and 48kHz) via analogue inputs, features both optical and co-axial digital I/O, and comes equipped with Sony's Super Bit Mapping technology. And because this is a pro machine, SCMS copy protection is not included — though a 19-inch rack kit and infra-red remote are.

A HHB Communications Ltd, 73-75 Scrubs Lane, London NW10 6QU.
T 0181 962 5000.
F 0181 962 5050.
E sales@hhb.co.uk
W www.hhb.co.uk

SOS can be reached at sos.feedback@sospubs.co.uk
Our web site address is www.sospubs.co.uk

Above: Roland XP60.

Below: Roland SC880.

the MC505 Groovebox (£949) in a recent issue, and this integrated 64-note polyphonic sequencer/sound module (with built-in D-Beam light controller) is now joined by the SP808 Groove Sampler, a combination of intuitive sampler and digital recorder, with assignable pads and built-in Zip drive. A single 100Mb Zip cartridge provides a total of 64 track minutes of recording, and the SP808 also features built-in effects and Roland's dual D-Beam infra-red controller. This technology is licensed from Interactive Light, manufacturers of the Dimension Beam, reviewed in *SOS* May 1997, and allows you to trigger samples by passing your hands (or any other part of your body) over the SP808.

If that's not groovy enough for you, check out the JX305 Groovesynth (£949), which offers plenty of real-time control, a 61-note keyboard, 64-voice polyphony, 8-part sequencer, and 768 preset patterns. The JX305's sounds come from the MC505 Groovebox, with the addition of an extra 4Mb of instrumental waveforms, to make a total of 640 patches and 28 drum kits.

On a more traditional note, there's the new SC880 sound module (£699), a 1U rack with 64-voice polyphony, 32-part multitimbrality, 1117 internal voices, 42 drum kits and five effects processors.

The border between home keyboards and 'real' synths continues to blur with the release of the G1000 Intelligent Arranger Workstation (£1999) and the XP60 workstation (£1299). The G1000 is equipped with a 76-note velocity and aftertouch-sensitive keyboard, new auto-arrangement features and 32-bit RISC-based effects, and is the first product of its kind to incorporate a built-in Iomega Zip drive, as well as a SCSI port for data storage. The instrument features 64-voice polyphony and 32-part multitimbrality, plus 1152 newly developed sounds, 43 drum kits, 128 preset styles, and four audio outs.

The XP60 offers a weighted velocity- and aftertouch-sensitive 61-note keyboard, a large backlit display and an MRC-Pro sequencer with real-time arpeggiation. In addition to 64-voice polyphony, 512 preset patches and eight on-board drum kits, this GM-compatible instrument offers four expansion board slots, into which users can slot Roland SR-JV80 Series wave expansion boards (there's a choice of 11). The XP60 also features three powerful built-in effects processors — dedicated reverb and chorus processors, plus a multi-effects processor with 40 different insert effects. The 60,000-note sequencer also offers groove templates and phrase sequencing.

A Roland UK Ltd, Atlantic Close, Swansea Enterprise Park, Swansea, West Glamorgan SA7 9FJ.
T Brochure line 01792 515020.
F 01792 799644.
W www.roland.co.uk

Roland JX305.

shape of things to come

ReBirth, 909 style — TechnoBox TB909e, as redesigned by MacJunkie and Joy!peff...

...and Tomas Holmström's Massen Red Top version.

Friends of the 'Birth

You wouldn't think there would be anything left to say about Steinberg/Propellerheads *ReBirth RB338* virtual TB303 Bassline/TR808 drum machine software. But hot on the heels of the new filter that appeared in the recent v1.5 update is news of an even more outstanding new feature: user customisability. Although users of both PC and Mac versions will be able to change the physical look of the software and use their own samples for the drum section, only PC users have the benefit of a dedicated application. It's called *ReNovator*, is downloadable from the Propellerheads web site, and has been developed by Florian Bömers and Rob1 to allow you to insert new graphics, your own audio samples (of unlimited length) and file icons into *ReBirth*.

There are two new *ReBirths*, remodelled by users, available to download from the Propellerheads web site, and if they like *your* modification, it could end up there as well. *TechnoBox TB909e*, by MacJunkie and Joy!peff, provides techno fiends with what they've wanted all along: *ReBirth* with TR909 sounds. *Massen RedTop*, by Tomas Holmström, really goes to town on the presentation front, and is a 1950s-inspired mod described as "a cross between a Cadillac dashboard and a pinball machine."

W www.propellerheads.se/mods/index.html

Yamaha play a new card

Yamaha's forthcoming SW1000XG takes the guts of an MU100 GM/XG-compatible rack synth, adds multi-channel digital hard disk recording capabilities, up to seven effects processors and EQ, and packages the lot in a cross-platform PCI card. Available initially (as usual!) for PCs only, the card offers 20Mb of on-board samples, over 1000 voices, and 45 drum kits. It can be upgraded to include a physical modelling synth and a harmoniser, and is capable of providing up to 48 MIDI channels and up to 65-note polyphony, with analogue and digital connections. The card works with Steinberg's *Cubase VST*, Emagic's *Logic Audio*, *Cakewalk Pro Audio*, *Sound Forge*, *SAW* and more. The SW1000XG looks set to retail for under £1000.

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

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Spirit by Soundcraft™, Harman International Industries Ltd., Cranborne House, Cranborne Industrial Estate, Cranborne Road, Potters Bar, Hertfordshire EN6 3JN, England. Tel: +44 (0)1707 665000. Fax: +44 (0)1707 665461

Check out the Spirit Website: http://www.spirit-by-soundcraft.co.uk

The latest track to be pulled from Coldcut's latest album, *Let Us Play* (see feature in *SOS* October 1997), is being made available with a number of video remixes alongside the now traditional range of audio remixes. *Timber* has been treated by video artists Emergency Broadcast Network, Lucky People Centre, Protean Video Quest and the Clifford Gilberto Rhythm Combination. On the audio front, a radio edit has been produced by Coldcut themselves, with remixes by Quant, Future 3, Clifford Gilberto, Journeyman, Kirk DeGiorgio and Bundy K.

W www.obsolete.com/pipe/

The National Council for Educational Technology plans to release teacher support materials to help music teachers at Key Stage 3 (ages 11-14) become more familiar with the capabilities and skills required to incorporate technology in their music lessons. The pack will be published early this summer. There will be four modules, plus a supporting video covering the topics MIDI sequencing, CD-ROM, electronic keyboards, and recording and processing.

Korg are planning a spring tour, featuring Steve McNally demonstrating the latest Korg keyboards. Contact Korg for details of dates and venues.

T Brochure Line 01908 857150.

Yamaha Musicsoft Europe's web site is now receiving over two million hits a month, an increase of 100% since March 1997, when Macromedia gave Yamaha the 'Shocked Site of the Day' award. The popular site is managed by Co-Activ, who also run *SOS*'s web pages (www.sospubs.co.uk).

W www.yamaha.co.uk

Novation have hit the web. Check out www.nova-uk.com for details of the full Novation range, including the forthcoming Supernova polyphonic synth, due for release this year. The site also features product demos in AIFF format, free downloads of complementary software, and details of UK dealers and international distributors.

SCV goes to LA

SCV Electronics Ltd have announced that they are to re-brand their entire range of products under the LA Audio banner, with LA Audio becoming a bona fide division within SCV. The decision stems from the need to draw a distinction between SCV's dual activities, as pro audio manufacturers, and as distributors of products from the likes of Fostex, Opcode and Waves. Products that previously bore the SCV Electronics brand will in future carry the LA Audio marque. The range includes DI boxes, phase checkers, and the DigEQ programmable digital EQ/dynamics processor.

A LA Audio, 6-24 Southgate Road, London N1 3JJ.
T 0171 923 7447.
F 0171 241 3644.
E mail@laaudio.co.uk
W www.laaudio.co.uk

Former SCV Electronics products with their new LA Audio livery.

Livingston's new quarters

Livingston Recording Studios have recently completed a £40,000 refit of their SSL-equipped Studio 1. The work, which includes both cosmetic and structural changes, is the first major improvement to the room since it was built in the early '80s.

The original recording area, previously split into two large areas, now offers four separate isolated spaces, allowing excellent visual communication and making it ideal for bands and live recording. MD Jerry Boys says: "We found that, after the rebuilding of Studio 2, having many different recording areas was very successful for the kind of work we do here. They all offer different acoustics and can be totally isolated from each other, so it gives you a great deal of control. To achieve this we completely gutted the old dead area and have created extra room by replacing the old traps with more efficient, compact acoustic treatment. This has enabled us to add a semi-live piano room, which is about 12' x 14', and a large vocal booth, while keeping the dead-area floorspace the same. The live area has remained untouched because it sounds great and has been a firm favourite among our clients, particularly drummers."

The design for Studio 1 was a joint effort by Boys and London Sound Design, and includes the complete redecoration of the control room and lounge area, which has shed its 1980s browns and beiges for a brighter grey-and-purple colour scheme.

T Livingston Studios 0181 889 6558.

Our customers' comments

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

Geno Porfido, Boulevard Recording Co. New Milford, NJ

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

Johnathan Moffett, Drummer with Michael Jackson and Madonna

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

Garth Webber, Red Rooster Studio, Berkeley CA

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

Peter Thorn, What If? Productions.

Just about the only sound as sweet as our EQ!

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

Ghost

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shape of things to come

I/O Silver Lining?

Digidesign are about to announce the imminent release of an "entry-level" multi-channel audio interface for Pro Tools systems. The 882/20 I/O, which is expected to retail for £1057, offers 20-bit A/D and D/A conversion and comes in a 1U rackmount package. It features eight balanced analogue ins and eight balanced outs (all on jacks), with two channels of 24-bit S/PDIF I/O, a 50-pin peripheral cable for connection to a Pro Tools system audio card, and slave clock I/O.

Also new from Digidesign is the ADAT Bridge I/O, costing around £1069, which will allow Alesis ADAT tape-based digital 8-track recorders to be integrated into Pro Tools systems. The unit actually offers 16 discrete channels of ADAT optical audio, allowing all the tracks of two ADATs (or 16 channels of ADAT-compatible audio) to be transferred into Pro Tools in a single pass. It can be used as a sole interface, or in conjunction with the 888/24 I/O, 888 I/O or 882 I/O. If you use more than two ADATs, multiple ADAT Bridges can be chained to provide 72 channels of transfer. An upgrade path will be available to owners of the existing Digidesign ADAT Optical Interface.

A Digidesign UK, Westside Complex, Pinewood Studios, Iver Heath, Pinewood, Bucks SL0 0NH.
T 01753 653322.
F 01753 654999.
W www.digidesign.com

Dial M for music...

The music technology department of the City Literary Institute in London has recently purchased new equipment from The M Corporation. The department's new facilities include several workstations based on Apple 7300 Power Macs running Steinberg's *Cubase Score VST*, plus Digidesign Pro Tools 4, Akai S2000 samplers, Mackie 1202VLZ mixers, Roland XP50 keyboards and Sony DAT machines. The Institute has been running courses for two years, with current daytime and evening courses including Level 1: Sequencing, Level 2: Composing & Sequencing, and "Level 3: Sequencing with *VST*. Plans are also afoot to develop new courses centred around the Pro Tools 4 system.

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

T City Literary Institute, 0171 242 9872.

Picture this

Meta Synth is a graphic sound-design and composition program for the Mac, developed by U&I Software and marketed by Arboretum Systems. The software combines sampling, wavetable, additive, subtractive, granular and Frequency Modulation techniques with "the most intuitive means for visualising audio information ever devised". A so-called 'image synth palette' actually lets you paint with sound: draw in fundamentals, harmonics and undertones, or paint a vivid tone picture in broad strokes. Users can even import any PICT file and use that picture as a starting point for a new sound or composition. *Meta Synth* also features frequency-domain graphic filtering, an effects palette, advanced vocoding, resynthesis, and morphing tools. *Meta Synth* runs on any Power Mac, with no extra hardware required, and costs £195 including VAT.

Meta Synth.

Arboretum's Ray Gun.

Also new from Arboretum Systems is a Windows version of their *Hyperprism* audio effects software. *Hyperprism DX* v1.0 (£299) is compatible with any Microsoft DirectX or Active Movie-compatible application, such as *Cakewalk Pro Audio*, *Sound Forge*, *WaveLab*, *Cubase VST* for Windows and *Cool Edit Pro*. The collection of 25 digital effects includes pitch changer, compressor, room and hall reverbs, ring modulator, single and multi delays, echo, low-pass, high-pass and band-pass filters, phaser, flanger, chorus, tremolo and noise gate. Simple on-screen sliders control the effects settings, or you can use *Hyperprism*'s familiar Blue Window interface.

Lastly, Arboretum's new *Ray Gun* (£99) offers low-cost, high-powered noise reduction for audio enthusiasts and project studios. *Ray Gun* can be used for audio restoration, dialogue clean-up, and music recording, selectively removing hiss, hum, crackles, pops and other unwanted audio, and leaving the original signal intact. *Ray Gun* is a stand-alone Mac application and includes Premier plug-in compatibility.

A Unity Audio Limited, Upper Wheeler House, Colliers End, Hertfordshire, SG11 1ET.
T 01920 822890, 0385 891030.
F 01920 822892.
E sales@unityaudio.co.uk
W www.unityaudio.co.uk

The 'Rite Stuff

Focusrite are making price cuts to their Green range of mic preamps, EQs and dynamics processors. The strength of the pound has apparently allows the company to reduce manufacturing costs without compromising quality. The new prices are as follows:

- Green 1 Dual Mic Preamp: £668.58 (reviewed February 1997).
- Green 2 Parametric EQ: £703.83 (reviewed January 1997).
- Green 3 Voicebox: £997.58 (reviewed November 1996).
- Green 4 Dual Compressor/Limiter: £1056.33 (reviewed July 1997).
- Green 5 Channel Strip: £1056.33 (reviewed July 1997).

A Focusrite Audio Engineering Ltd, 19 Lincoln Road, Cressex Business Park, High Wycombe, Bucks HP12 3RD.
T 01494 462246.
F 01494 459920.
E sales@focusrite.com
W www.focusrite.com

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

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

Be a Sennheiser scholar!

Sennheiser have announced the foundation of a student scholarship scheme at The Liverpool Institute for Performing Arts. Sennheiser UK MD Paul Whiting recently presented the first scholarship to Chris Beech, who is studying for LIPA's BA in Sound Technology. The scholarship will eventually see three Sound Technology Degree students, one from the UK, one from Europe, and one from the rest of the world, attending at any one time. Students will have the full cost of their fees met, and will receive contributions towards academic expenses and accommodation costs. Candidates will be nominated by LIPA's entrance board from the annual intake of students, being identified as likely to benefit both from the financial support and from an association with the company. The Sound Technology degree which Chris is taking covers all aspects of pro sound production, including touring sound, theatre sound, recording, radio, TV and film post-production.

Paul Whiting (left) presents Chris Beech (centre) with the first Sennheiser LIPA Scholarship, while LIPA Chief Executive Mark Weatherston-Witty (right) looks on.

LIPA has also taken delivery of a 12-channel Sennheiser Channel 69 UHF radio mic system, for use by students in its two theatres.

A Sennheiser UK Ltd, 3 Century Point, Halifax Road, High Wycombe, Bucks HP12 3SL.
T 01494 551551.
F 01494 551550.

Crown's royal couple

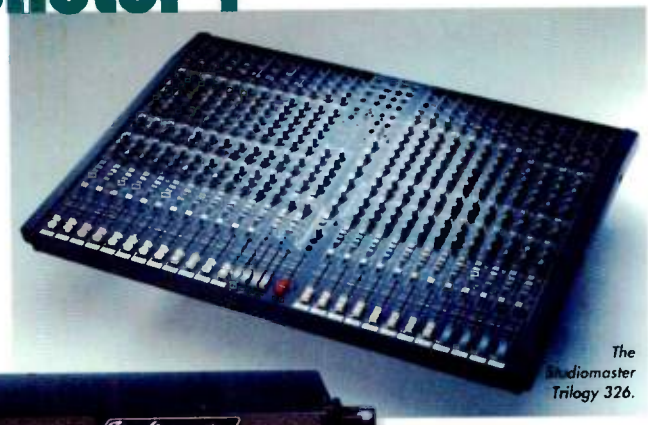
Crown have launched a new family of "affordable" stereo power amps. The CE Series uses a common 3U, heavy-gauge steel rack package, and is designed for "long-term reliability with minimal maintanence considerations". The series currently runs to two models, both with true 2Ω capability: the CE1000 (£699 including VAT) puts 450W per channel into 4Ω (or 560W into 2Ω), and the CE2000 (£934 including VAT) runs at 660W per channel (4Ω) and 975W (2Ω). All controls are on the front panel for easy access, though the soft-touch knobs can be removed to prevent unauthorised tampering. Multiple input options are featured, and a proportional speed fan provides the right air flow for prevailing conditions. The amps are also compatible with Crown's user-installable STT — System Solution Topologies — input modules.

A Fuzion plc, 2 Lyon Road, Walton-on-Thames, Surrey KT12 3PU.
T 01932 882222.
F 01932 882244.
E 100517.254@compuserve.com

shape of things to come

Studiomonster?

Studiomaster are expanding their Trilogy range of 4-buss mixers with the 24-channel 326. The total of 32 inputs is made up of 20 mono inputs plus four Mon:Ster channel strips. I'm glad you asked: each of these strips features a mono mic and stereo line input, adding up to a further 12 inputs. Add four dedicated stereo returns and you have 40 inputs on mixdown.



The Studiomaster Trilogy 326.

The C180 crossover.

Mono channel features include: balanced mic and line ins, insert points, 3-band EQ (with mid sweep and HPF), six aux sends, and a 60mm fader. All aux sends are balanced and can be set for pre- or post-fade operation. Stereo channels have the same features, with fixed 3-band EQ that can be placed in the mono mic or stereo line signal path. PFL and Solo In Place monitoring are available, and power comes from a fully regulated external PSU. Price? £1199 including VAT.

At £129, Studiomaster's new 1U rackmounting C180 crossover is claimed to be "the most cost-effective two-way stereo crossover available". The active 18dB/octave design is based around a 'fit and forget' principal, with just rear output-level controls available to the user. The C180 comes with a 150Hz crossover point — Studiomaster have found this to be the most popular — but is supplied with four other plug-in frequencies (80Hz, 100Hz, 200Hz and 250Hz). Connections are via jack and XLR inputs, and XLR outputs; signal is indicated by front-panel LEDs, and there are ground-lift switches on both inputs and outputs.

A Studiomaster, Studiomaster House, Chaul End Lane, Luton, Bedfordshire LU4 8EZ.
T 01582 570370.
F 01582 494343.
W www.studiomaster.com.

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

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

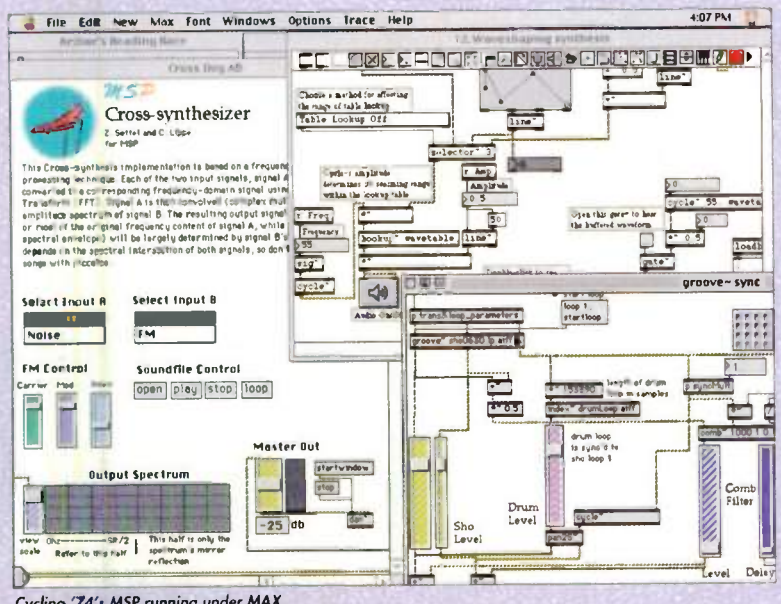
Worldwide marketing of Joemeek signal processors and preamps was recently taken over by Joemeek Distribution, based at the Fletcher ElectroAcoustics facility where Joemeek equipment is designed and developed.
A Joemeek Distribution, Quay House, Quay Road, Newton Abbot, Devon TQ12 2BU.
T 01626 333948.
F 01626 333157.
E tedf@eurobell.co.uk

As a postscript to last month's item about free plug-ins, we've found a couple on Arboretum's web site. The company, who are behind *Hyperprism*, have an Adobe Premier-compatible low-pass filter and echo for Mac users, and DirectX-format ring modulator, echo and vibrato plug-ins for Windows 95 users. Simply take your web browser to www.arboretum.com.

Stockport's Axis Audio Systems have recently supplied and fitted five complete Soundscape digital audio workstations to the media department at Solihull College. Each system is based around a Pentium P166MMX PC with 17-inch monitor and Spirit Folio Notepad mixer.
T Axis 0161 474 7626.
T Soundscape 01222 450120.

Following the recent acquisition of the distribution of JBL, C-Audio, AKG and Steinberg, ranges that were previously handled by Harman Audio, all sales and marketing personnel relating to these brands will relocate to Arbiter's Hendon office. This doesn't affect warehousing or service: these divisions remain at the Borehamwood premises.
A Arbiter Group plc, Wilberforce Road, London NW9 6AX.
T 0181 202 1199.
F 0181 202 7076.

Tour de MAX



Cycling '74's MSP running under MAX.

New software company Cycling '74 have released a set of extensions for Opcode's *MAX 3.6* graphical programming environment. *MSP*, as the software set is called, consists of over 60 objects that synthesize, process, analyse and delay audio signals in real time on a Power Mac computer. Objects can be grabbed and grouped in a graphical manner, to create custom applications, and the software is aimed at musicians, sound designers, educators and researchers. A trial version is downloadable from the Cycling '74 web site, with authorisation costing US$295. While *MAX* is required to created and edit *MSP* applications, a run-time version is available which comes with a full set of objects for you to play with.

Cycling '74 have also issued a new version of *M*, the interactive algorithmic composition program.

W www.cycling74.com/

Essential Dance Tools

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

ReBirth
Virtual Synthesizer

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

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

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

ReBirth - rrp £149.00 inc.vat.

NEW in version 1.5

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

ReCycle!
Groove Analysis

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

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

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

ReCycle - rrp £199.00 inc.vat.

Visualize your Mix X<>POSE

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

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

X<>Pose - rrp £399.00 inc.vat.

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

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

Steinberg

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

www.steinberg.net

shape of things to come

Behringer's blue period

Behringer's MX32:8:2 mixing desk, reviewed in January 1998's *SOS* is no more. In its place is the MX32:8:2A, part of the redesigned A-series of mixers. Not only does the new series show Behringer products in a new blue livery, but the move also sees physical changes in the mixers. For example, the MX32:8:2A now features a modified connector panel, positioned at the top of the mixer for easier access, rather than at the back as on the original desk. To recap, the MX3282A features 32 input channels, each assignable to eight sub-groups, with eight aux sends, and 3-band EQ with swept mids on the mono channels and 4-band EQ on the stereo channels.

Other mixers getting the A-series treatment include the compact Eurorack MX802A, which provides four mic/line inputs, two stereo channels for line-level inputs, two aux sends and a 3-band EQ. Lastly, there's the Eurorack MX2004A, which offers eight mic/line channels with 3-band EQ (swept mid) and insert points, and four stereo line channels equipped with a 4-band EQ. Two aux sends (one fixed post-fader and the other switchable pre-/post-fade) and two stereo aux returns provide extra flexibility. In addition, the MX2004A offers switchable phantom power, a 12-segment LED display, PFL and SIP (Solo In Place).

A Behringer UK, St Vincent House, 59 Woodbridge Road, Guildford, Surrey GU1 4RF.
T 01483 458877.
F 01483 458822.
W www.behringer.de

'Jet-powered Vestax

SyQuest Technology recently announced an OEM (Original Equipment Manufacturer) agreement with Vestax. As a result, SyQuest's SyJet 1.5Gb removable hard drive will be incorporated into Vestax's HDR V8 digital recorder/mixer (reviewed in *SOS* March 1997). The drive, which is used by professionals in the digital audio and video fields, was chosen after thorough testing by Vestax, and has been the recipient of several awards recently, including an MVP — Most Valuable Product — award at the massive Comdex computer trade show in the USA a few months ago.

A Vestax (Europe) Ltd, 18 St Christopher's Road, Haslemere, Surrey GU27 1DQ.
T 01428 653117.
F 01428 661021.

news from NAMM

Selected Highlights by Paul White & Dave Lockwood

The NAMM show is where the majority of new musical and recording equipment is unveiled, so it's a useful barometer of which way the industry is going. In fact NAMM 98 had both a theme and an anti-theme. The theme part is that virtually every serious piece of digital audio kit is now going 20-bit or more — Alesis have a new range of 20-bit ADATs, Yamaha have a 20-bit digital studio on a PCI card, Lexicon have a new range of low cost 20-bit effects and England's own Spirit have a very nice-looking new 20-bit digital mixing console. Digidesign's Pro Tools went 24-bit a few months back. In fact if you were to believe all the publicity, poor old 16-bit is now fit only for demos, but the reality of the situation is that most 20-bit project studio users will probably be using at least eight of those bits to record hum and noise! Even so, having 20 bits means more headroom, and in more discerning setups, it provides a better dynamic range with cleaner low-level signals.

And now to the anti-theme, which can be summed up in one word — diversity. Look in one direction and you'll see virtually all the major sequencer companies producing software capable of sequencing, audio recording, mixing and signal processing entirely on the host computer. Look in another and you'll see that **Yamaha** (01908 369269) have joined the DSP card revolution started by Digidesign by putting what is in effect an 02R mixer onto a PCI card that also supports 16-track hard disk recording. Additional I/O comes in boxes that slot into the host computer's spare drive bays. This clearly takes a load off the host processor, and provides a 20-bit signal path plus two dedicated REV500 style effects units to boot. Check out the report of *SOS*'s Yamaha factory visit on page 22 for more details on this and the new EX range of keyboards and modules.

Alesis were showing a promotional video featuring James Doohan (*Star Trek*'s Scotty, who was billed as "a famous engineer") explaining why tape is still a good idea. Disks are fine, but you need 30 ZIP disks to hold the same amount of data as you can get on a single ADAT tape. Tape is cheap, you can put it on the shelf when you're done so archiving isn't a problem, and unlike computer audio, there's no way the tracks can slide out of sync with each other. Perhaps there's life in tape yet?

Obviously Roland, Korg, Akai (see the review of their DPS12 on page 180), and Fostex see the future in tapeless hardware terms, as they've all produced new 'studio in a box'- type digital recording systems, though they obviously can't agree on whether the mixer should be analogue or digital. Even Yamaha have backed both horses by developing the MD8 8-track Minidisc-based multitracker. As reported in full on page 8 this month, **Roland** (01792 515020) launched a whole swathe of new gear at the show, star of which was undeniably the VS1680. This offers 16-track hard disk recording with 20-bit A/D converters, building on the VS880 idea, but with an enhanced user interface and a much bigger screen.

Korg (01908 857150) were also exhibiting their new products, most of which, like Roland's VS1680, have already been mentioned in *SOS* (this time in

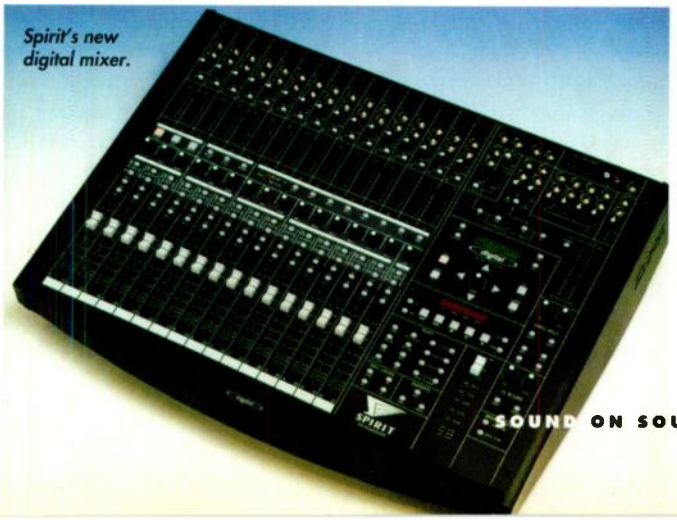
January's News pages). As well as the SGproX digital piano, SG Rack module, and N1 and N5 keyboards (see N5 review on page 166 this month), the D8 Digital Recording Studio was on display, with a slightly updated spec (the internal drive supplied is now 1.4Gb, not 1.2Gb, and the standard machine now also offers a guitar DI input and internal effects processing based on the algorithms in Korg's previously released Pandora guitar processor).

Fostex (SCV London 0171 923 1892) have really hedged their bets with their new, low-cost FD4 digital multitracker, because this machine doesn't even have an internal drive fitted (though there's room for a 2.5-inch IDE drive inside). Designed to look and operate much like an analogue multitracker, the FD4 uses a SCSI2 port so you can record directly to any suitable SCSI drive, including ZIPs, Syquest EZ Flyer and Jaz formats. All these machines send out MTC for sync'ing to sequencers, and because they have built-in mixers, they fit nicely into the MIDI + Audio environment.

Fostex's new FD4 digital multitracker.

But if integrated recording and mixing systems are the way to go, why was everybody so interested in digital mixers, especially **Spirit by Soundcraft**'s (01707 665000) new Spirit 328? Perhaps it's because you never have enough inputs on an integrated system, or perhaps it's because most people want their mixers to be real rather than virtual? Spirit's moving-fader 328 satisfies on both accounts, and if their projected April/May launch date works out, they may even get into the shops before Mackie's rather larger digital 8-buss. The 328 has a full 16 mic/line channels and 16 tracks of ADAT and TDIF tape interfacing as standard, plus five stereo inputs. With a Lexicon effects processor and two assignable dynamics processors, the 328 is designed to be used within 10 minutes of opening the box, without even reading the manual. Spirit's secret is to allow the row of pots above the channel faders to double as a horizontal channel strip, providing direct access to all the EQ, aux sends and pan of the selected channel without the need to switch modes or cruise menus. Snapshot automation comes as standard with full dynamic automation requiring a sequencer. Routing is also accomplished by physical routing buttons in the master section. In terms of overall interest, I think it's fair to say that Spirit's 328 digital mixer and Yamaha's DSP Factory (more of which on pages 23 and 24) were the stars of the show.

The **RAMSA Panasonic** (01344 862444) DA7 compact digital mixer, secretly previewed at the New York AES, made its first full outing. The DA7 is a 32-input, 8-buss desk with 24-bit I/O, dynamic and snapshot automation and surround mixing capability. Like the Spirit desk, it is aimed at the digital multitrack user, and seeks to offer an efficient, easy-to-use interface, without buried layers and the need for constant reference to the screen.



Spirit's new digital mixer.

Another surprise entry to the digital mixer market — RAMSA's DA7.

Mackie's (Key Audio Systems 01245 344001) Digital 8-buss has increased in both price and sophistication and looked extremely attractive, but being realistic, it will probably be beyond the financial reach of all but the most serious project studios. Furthermore, the shipping date has still not been announced, though Greg Mackie told us that work on the console software was now well advanced. We'll keep you posted on this one.

The **Alesis** (Sound Technology 01462 480000) ADAT range has now gone completely 20-bit. Top of the range is the M20, 'the model formerly known as Meridian' while the XT models are being replaced by the 20-bit XT20. As far as I can tell, the XT20 has the same transport, features and connections as the original XT, but with the addition of 20-bit converters.

A little further down the price range comes the LX20, a slightly simplified model without the balanced ELCO connector and with just five locate points. The LX20 will run in a system with the XT20 or with any of the earlier ADATs, and all new ADATs can play and record 16-bit ADAT Type I tapes, as well as record in the new 20-bit Type II format. However, you can't play a new 20-bit type II tape in an old type I ADAT.

The new Alesis ADAT PCR card is a dual-platform Mac/PC PCI card designed to act as an interface between an ADAT and a computer at up to 24-bit resolution. Data can be transferred both ways with sample accuracy, and the card may also be used with other devices that use the ADAT optical interface. PCR comes with software for sequencing, digital multitrack recording and editing.

Alesis have also launched the DG8 64-voice digital grand piano with 16Mb of sound ROM driven from an 88-note, weighted hammer-action keyboard. Stereo 100W amps and speakers are built in for performance and rehearsal, and the instrument has a comprehensive MIDI specification. Also new in the MIDI arena is the Nanotracker, a Microverb-sized sequencer/data filer that offers 16-track recording with internal flash RAM storage for around 50 songs and a PCMCIA Flash RAM card slot for additional storage.

Alesis's new mid-range ADAT, the LX20.

Also benefiting from the 20-bit revolution was Alesis' Q20, a 20-bit ▶

news from NAMM

▶ equivalent of the Q2 effects processor, and the DM Pro 20-bit drum module, which looks like a D4/D5m on steroids and includes 64-voice polyphony, over 1000 on-board sounds and the ability to import new sounds or store patches on PCMCIA card. The Alesis Sound Bridge system may be used to pipe new samples into the machine, and all sounds can be treated using the on-board effects processor. Interestingly, the only other drum machine we saw at the show was from **Zoom** (Exclusive Distribution 01462 481148), a company more normally associated with guitar effects. The Zoom RhythmTrak combines the features of a traditional 100-sound drum machine with a choice of 50 bass loops, and a number of the drum sounds are optimised for techno/dance music. Almost 200 preset drum patterns and grooves are included in various styles and up to 99 user patterns can be stored.

With the Studio system from **Lexicon** (Stirling Audio 0171 624 600) not in the shops yet, the company is continuing to expand its product line with the MPX G2 guitar effects processor, a spin-off from the successful MPX1 studio effects box. This features a split topography so the dynamic processors can be placed before a guitar amp and the effects in the amp's effects loop, but perhaps the most exciting aspect of the unit is that it contains emulations of a number of classic guitar pedals.

More interesting to the project studio owner is the MPX100, which replaces the Lexicon Alex as the entry-level Lexicon. This 1U processor features the now familiar two-knob system for dialling up one of 240 presets with further knob control over levels, balance and one key effects parameter. The presentation is impeccable and the effects generation comes from the new Lexi chip for high-quality reverb. Delay times of up to 5.7 seconds are possible, and there's full MIDI control of patches. No UK price has been settled yet, but it may well come in at around £250!

Lastly from Lexicon (and least expected) is the all-analogue, all-valve Signature 284 Class A Stereo Recording amplifier. This 2U module is based on a design by John Macintire and is intended for guitar recording where a low power output may also be needed to drive loudspeakers. Rated at around 6W per channel, the 284 features an all-valve effects loop, integral speaker simulator and built-in power soak for silent recording.

The inaugural product in **Digitech**'s (Arbiter 0181 202 1199) new 'Digitech Studio' division, the S100 multi-effects processor, also made its first appearance at the show. Trailed in last month's News pages, the dual or true stereo effects unit, housed in a stylish full-width 1U rack chassis, both looked and sounded good. If this one is anything to go by, the rest of the range will certainly be of interest.

Lexicon's MPX G2 guitar effects processor.

Steinberg (Arbiter 0181 207 5050) impressed with the latest version of *WaveLab* (v2.0), their Windows 95/NT editing/mastering program. Different edits of a title can now be created without having to generate a new audio file for each one, and *Cubase VST* plug-ins are now supported. New analysis functions can automatically detect glitches or distortion generated during file transfer, and finished files can now be exported to ExaByte cartridge. Updates to Steinberg's *Cubase VST* v3.55 for Windows include channel inserts which allow every channel of the mixer to run four additional effects. Support of *ReCycle* Export Files allow the use of recycled sample loops without using a dedicated hardware sampler.

The DP8 from **Fostex** (SCV London 0171 923 1892) addresses the increasing complexity of digital interfacing requirements in the form of an easy-to-use, cost-effective digital router/patchbay. Six optical (ADAT format) I/O ports and a pair of S/PDIF co-ax connections can be freely interconnected and re-routed with a high degree of signal integrity, as each input is wave-shaped to provide an optimum clean output, with conversion between the two formats also available. Another cost-effective problem-solver from Fostex is the new COP2 balanced optical converter, which allows optical-format multitrack digital or S/PDIF signals to be converted to a balanced XLR electrical format for transmission over longer distances.

JBL (Arbiter 0181 202 1199) were exhibiting their new LSR (Linear Spatial Reference) series of studio monitors; the LSR28P bi-amped system and LSR12P powered sub were added to the range at the show. The new models incorporate more DCD-based (differential coil drive) transducers for low distortion at high power levels. Apparently psychoacoustic principles were utilised in the development of these systems to optimise direct and reflected soundfields. JBL claim that this results in a wider than normal working area, rather than a defined 'sweet spot'.

Emagic (Sound Technology 01462 480000) have made some changes to the *Logic* range. The software now comes in four guises: *Logic Audio Platinum* for the pro user, *Logic Audio Gold* for the serious project studio, *Logic Audio Silver* for the home user/student, and the entry-level *MicroLogic AV*. The principal change is the integration of the Extension series along with the incorporation of audio and real-time effects in all versions.

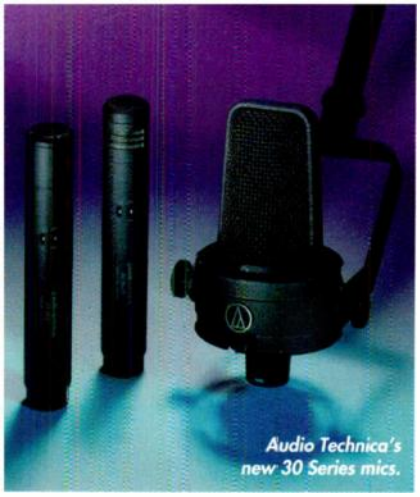
Version 2.0 of the digital audio editing software *Peak* from **BIAS** (SCV London 0171 923 1892) takes the program to new heights, with SMPTE sync, high bit rate file handling, support for Adobe Premier plug-ins in real time, RealAudio support for Internet file authoring, and the ability to burn audio directly to CD from within the playlist. A new interface takes full advantage of Mac OS8 features.

The first in the new Silver range of valve gear from dbx, the 586 dual-channel mic preamp.

In addition to their new entry-level interface products (see page 14), **Digidesign** (01753 653322) were also offering a free software update for Pro Tools 24 which allows the system to support 64 tracks of record and playback via additional d24 and DSP Farm cards.

There was lots of new stuff from **dbx** (Arbiter 0181 202 1199), including a couple of contrasting mic preamps. The 786 from the sumptuously built Blue range is a solid-state model with a transformer-coupled input stage, followed by an audiophile-grade signal path. Spectrum and Detail controls govern a low phase shift HF shelving EQ with a turnover frequency variable between 5kHz and 40kHz.

A totally different approach is taken by 586 Dual Vacuum Tube Preamp from the new Silver Series. Mic and Line inputs with Drive control, followed by 3-band EQ with sweepable mid, and PeakPlus



Audio Technica's new 30 Series mics.

limiter stage allow extensive sonic tailoring for creative purposes. Logically, on-board A/D conversion (the new DBX Type IV) is an option, offering 16 or 20-bit word length and a choice of noise shaping and dither types.

Continuing the digital theme, the new DDP Digital Dynamics Processor offers a collection of classic dbx analogue dynamic processes within the digital domain. Housed in a 1U chassis, the true stereo (or dual mono) unit incorporates 24-bit conversion, with digital I/O as an option. Additional processes include Tape Saturation Emulation and a new 'VariKnee' transfer characteristic. The sophisticated metering and real-time graphic effects display, together with the extensive preset storage, made for a very attractive unit.

Designed to offer the high-end performance of studio quality condenser mics at "affordable prices" in the MI market, **Audio Technica** (0113 277 1441) launched their 30 Series mics. Extended frequency response and high SPL handling make the cardioid AT3525 well suited to a wide range of applications from vocals to drum overheads, whilst the low-profile AT3528 cardioid handles instrument duties. The range also includes an omnidirectional model, designated AT3527.

Cakewalk (Et Cetera 01706 228039) announced their next generation (v7) of their flagship software *Cakewalk Pro Audio*, which features several enhancements. There's a new mixing console which allows the user to record and mix an entire MIDI and digital audio project from a single window, enhanced notation editing and printing, a significantly improved user interface and the ability to open several projects at once. *Cakewalk Pro Audio* v7 will also support the new Yamaha DS2416 digital audio card, giving users access to real-time mixing and effects without further taxing the host computer.

Antares Systems (Unity Audio 01920 822890) are the software company that brought us the remarkably effective *Auto-Tune* TDM plug-in for correcting the pitch of vocal or instrumental performances (see review in *SOS* August '97). They surprised everyone at NAMM by introducing a *hardware* product, the ATR1 "Auto-Tune in a Rack", which they claim offers automatic real-time pitch correction whilst still preserving the expressive nuances of the original performance. The ATR1 is supposed to have the same real-time features as the software version, but the hardware format makes it far more accessible to a wider market, including those working in the live performance arena. Given the projected UK price of £999, we wouldn't be surprised to see the first UK shipment sold out before it lands!

Sennheiser (01494 551551) launched their Evolution series — a range of eight new dynamic mics, all at surprisingly affordable prices "without compromising performance or durability". Designed for both vocal and instrument use, the new range includes four hand-held models (the cardioid E825 and E835 and supercardioid E845 and E855) with frequency responses tailored for different vocal applications.

The E602 and E604 cardioids are bass drum/bass instrument and snare/tom mics respectively — the supercardioid E608 is designated for use with wind/horns and the E609 for guitar cabinets.

Allen & Heath (01326 372070) made an innovative return to the 8-buss recording console market, unveiling their new GS3000 model. The traditional in-line console format, with twin large fader/small fader dual path inputs, is augmented by a pair of patchable valve preamps which can be configured for balanced mic/line or high-impedance guitar inputs. The preamps offer valve drive level, a high-cut filter and output trim. There's also 4-band EQ with true parametric mids (including 'Q' controls), access to six auxes, solo-in-place and MIDI mute automation.

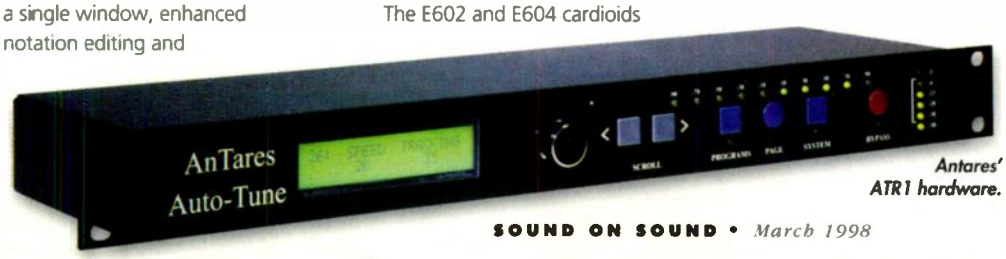
Targeting the project and small commercial studio sector, the GS3000 will be available in 24- and 32-channel frames (each with an additional two dual stereo inputs, providing 52 or 68 inputs to the mix), and is expected to retail for under £5000.

Allen & Heath return to the recording market with the GS3000 8-buss mixer.

Emu Systems (0131 653 6556) released the latest EOS 3.0 operating system for their Emulator 4 range, adding 48-track sequencing with loop record, and a host of sophisticated performance control features: an arpeggiator, split mode, layer mode, and new modulation sources and destinations. In addition, a 16Mb ROM board upgrade — the E-Synth ROM — is now available. Emu also announced a number of new partnerships with software companies to provide support for the Emu samplers, including Emagic, BIAS, Sonic Foundry, Steinberg, Interval Music and Gallery Software. *Digital Performer* v2.1 from **MOTU** (MusicTrack 01462 812010) can now interface directly with Emu's EOS and ESI samplers, with samples pastable directly into the digital audio tracks (see review starting page 74).

The Gigasampler from **NemeSys** (EastWest Distribution 01273 736733) takes a radically different approach to sampling. Rather than being limited to the amount of available RAM in typical hardware samplers, the Gigasampler streams data directly off the hard disk of a PC, allowing much larger and more realistic samples, without having to use looping. The system is configured to access the initial portion of samples via RAM and then seamlessly cross over to the audio off disk. This is pretty clever, and it seems to work well too, allowing huge multi-sampled instruments that offer great realism and expressiveness.

Those of us with 'normal-sized' fingers will welcome the re-styled, 'open-faced' **Focusrite** (01494 462246) Green 6 quad compressor/limiter, which, naturally, sounds super, and is now more practical to use. Of course, it just wouldn't be a NAMM show without a whole bunch of new cool stuff from **ART** (Music Connections 0171 731 5993) with tube-based compressors, mic preamps and EQs to the fore. **Drawmer** (01924 378669) also added a very nice de-esser to their cost-effective M Series. Limited space precludes further highlights, but an honourable mention has to go to **Axsys** (Sound Technology 01462 480000) for taking their physical modelling guitar amps (Line 6 and the new Flextone model) to new heights. ❑



Antares' ATR1 hardware.

preview

Yamaha's Range

PAUL WHITE returns from the land of the rising Sterling with tidings of a whole new range of Yamaha hi-tech and pro audio products.

I've just returned from a week's tour of Yamaha's design and manufacturing facility in Hamamatsu, Japan, where I learned a surprising amount about the way the company works and how they go about designing new products. I was also able to speak to the engineers behind such products as the AN1x and VL70m synths, and was impressed by their genuine enthusiasm and inventiveness. Over a traditional Japanese meal, I enquired as to how new synthesizers are developed and asked whether computer simulations are used before the hardware is built. I was told that Yamaha do indeed have a computer-based development platform that allows new ideas to be developed and verified before anything has to be built at all.

Being a traditional Yorkshireman who likes all his food cooked to a uniform brown throughout (including curry), I was less convinced by the local cuisine, some of which looked more like the cover of an HP Lovecraft novel than the food I'm normally used to, but the hospitality was faultless, right down to hotels with electrically heated toilet seats! Best of all, I got an early preview of the instruments and studio gear due to be launched at the forthcoming American NAMM show.

Yamaha never stand still when it comes to developing synthesizers, and with FM and physical modelling on their list of firsts, it came as no surprise to me that they had something else up their corporate sleeves. New for '98 is the EX range of instruments which, with their blue casings and marriage of technologies, definitely qualify as 'something old, something new, something borrowed and something blue'.

EX SYNTHESIZERS

The EX synthesizers are clearly intended to appeal to the same market sector as the Korg Trinity, and there are parallels in that the EX series employs a number of different synthesis types in the same machine. Available in two keyboard formats (EX5 and EX7) and as a rackmount module, the EX5R, the new machines feature both a sequencer, that can also replay Standard MIDI Files direct from disk, and a 4-track arpeggiator with 50 presets and 50 user memories. A feature common to both the EX5 and 5R models is a massive 126-voice polyphony, using 16Mb of internal AWM2 (Advanced) sounds, plus two further two voices of AN (AN1x-style) analogue modelling and one voice of VL modelling, similar to that offered by the VL70m. The cheaper and slightly smaller EX7 has just one voice of analogue modelling, no VL modelling, and 64-voice polyphony.

If that were as far as it went, these would still be impressive instruments, but they also feature six real-time control knobs and a ribbon controller, as well as a brand-new sound-shaping system known as FDSP — see the 'FDSP' box for details. On top of all that, the EX machines can sample, and the internal 1Mb sample memory may be expanded up to 64Mb using standard SIMMs; up to 8Mb of non-volatile flash RAM may also be added. With the optional SCSI interface fitted, the machines can access standard sample CD-ROMs (Akai, AIFF and WAV formats), with the EX7 offering mono sampling and the EX5 and EX5R stereo sampling. Samples may also be resampled via the on-board effects if required.

In addition to the SCSI interface, other options include an individual output board to add four further outputs, and a digital output board with word clock input. The

Yamaha EX7.

Yamaha EX5R.

for '98

Yamaha MD8.

brief demonstration proved the EX instruments to be capable of a wide range of sonic styles, from conventional additive sounds and responsive pianos, to raw techno and abstract effects. With their friendly user interface, these machines should prove popular across a wide range of musical styles.

P200 ELECTRONIC PIANO

For those of a more traditional disposition, the P200 is an 88-note electronic piano featuring a newly developed weighted keyboard action, with four keyboard zones; the low notes have a heavier action than the high notes, just like the real thing. The sound-generating system is based on 16Mb of AWM sounds and has 64-voice polyphony. Twelve different voices are available, and there's a built-in speaker system for practice or low-level performance. There are two independent MIDI transmission channels for driving external MIDI equipment, a panel-lock mode to prevent inadvertent program change during performance, and a choice of two stand types for road or home operation. The usual line outs, pedal connections, foot controller and MIDI connections are provided.

Yamaha P200.

MD8

MiniDisc has proven to be a convenient and cost effective alternative to the analogue cassette for use in all-in-one 4-track multitrackers, but four tracks doesn't seem that generous when compared with 16-track hard disk systems. To take the concept further, Yamaha have developed an 8-track MD system that uses data MDs, running at double speed, to provide 18 minutes of recording time (in 8-track mode) at a sample rate of 44.1kHz, using ATRAC data compression. The MD8 (covered briefly in last month's news pages) features 8-track, 4-track, 2-track and mono modes, but can also work in 2-track and mono modes using standard audio MDs, rather than the data MDs required for multitrack work. All eight tracks may be bounced down to one or more tracks, and the machine comes with a comprehensive set of locate, search and auto-punch-in/out functions, as well as varispeed.

A jog/shuttle wheel is used for song location and editing, and the mixer section is a traditionally laid-out, 8-channel analogue design, with 3-band EQ (swept mid), and two aux sends per channel, as well as in-line monitoring. Channels 1 and 2 also feature balanced XLR mic inputs with phantom power and insert points, though all channels will work with mic as well as line levels. The machine supports MTC (MIDI Time Code), MIDI clock and MMC (MIDI Machine Control), with the ability to store a tempo map containing up to 26 tempo changes per song. A new feature is the ability to record up to 99 alternate takes per track and then pick the best one later, though you have to keep in mind that each take uses a corresponding amount of disc space.

DSP FACTORY

Yamaha are one of the few music equipment manufacturers to have their own semiconductor design and manufacturing facility, and their custom DSPs are one of the reasons the company has maintained its lead in low-cost digital mixers. Now the design team have turned their attention to the PC plug-in card market, by building a low-cost, 32-bit, ▶

FDSP

FDSP — or Formulated Digital Signal Processing, to give it its full title — is Yamaha's new system for adding note-dependent processing to AWM sounds, to give them greater realism. If the VL system was modelling, FDSP might be thought of as re-modelling, and in some ways it seems similar to Roland's V-Guitar process, which starts off with a raw, vibrating guitar string as the source, and then uses DSP to shape that sound. The EX series of synths features powerful effects processors, and the same elements that are used in conventional effects may also be used in FDSP, the main difference being that the effects parameters are note dependent. In effect, this means generating polyphonic signal processing; by using effects such as delay and equalisation it's possible to model the behaviour of such things as electric piano or electric guitar pickup types and positions. Because of the processing power needed to run FDSP, polyphony is reduced when FDSP is used.

FDSP comes with a set of preset configurations, which may be applied to an AWM sound and then adjusted to change the sound or to create more natural dynamics. For example, the electric piano configuration emulates the effects of changing pickup position and distance relative to the end of the piano tine. Not only does this produce timbral changes, but as the pickup is brought close to the tine, distortion may also be introduced. The electric guitar configuration emulates picking position, pickup position and so on. Up to four AWM elements, or three AWM elements plus one AN element, may be fed through the FDSP process, after which the sound may be treated using normal effects. Though I only heard a few examples of FDSP, the fact that chorus rates or delay times can be optimised for each note on the keyboard suggests that some interesting resonant effects should be possible.

Yamaha in '98

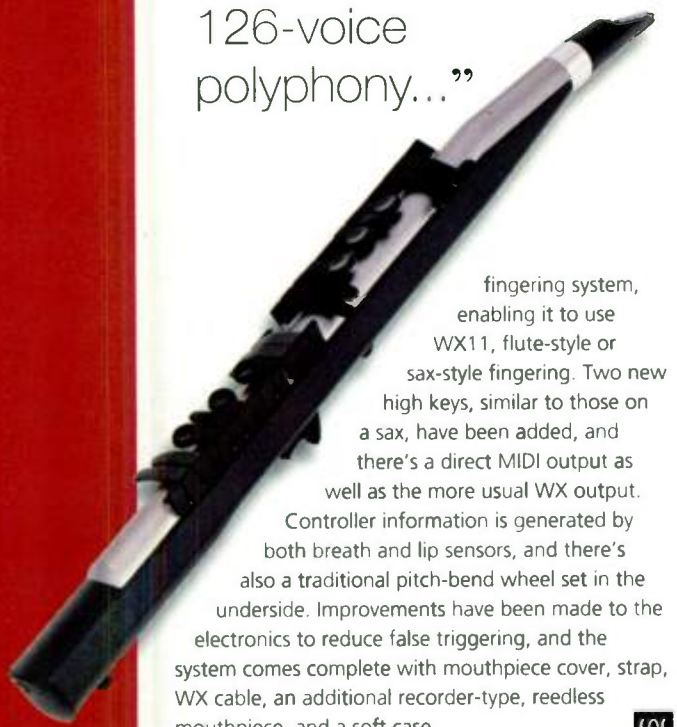
▶ DSP-based mixer, with effects, onto a single PCI card. The DS2416 card is at the heart of the DSP Factory system and employs five of Yamaha's own mixer DSPs (as used in their 02R stand-alone mixer) to provide a 24-input, 16-buss mixer, with two digital effects based on the same chips used in the REV500 effects processor and 03D mixer. All internal processing is at 32-bit resolution, with 44 bits used for the EQ. The card supports multitrack hard disk recording via the PCI buss, with up to eight simultaneous record tracks and 16 playback tracks. Stereo 20-bit inputs and outputs are included on the card, as well as co-axial digital I/O, which can work at up to 24-bit resolution.

The system was demonstrated running with *Cubase VST* via an on-screen mixer map, though other sequencer manufacturers are also working with Yamaha to provide support — more news on exactly who after NAMM. Those requiring more sophisticated I/O options will be pleased to note that the AX44 expansion unit provides four more analogue ins and outs, and up to two of these units may be used with a single DS2416 card. The AX44s fit into a standard computer drive bay and claim a noise figure of better than 100dB. At the moment, only the PC/Windows 95 platform is supported, though Mac support is under development.

WX5 WIND CONTROLLER

With the advent of the low-cost VL70m module, using a wind controller effectively has suddenly become more affordable, so Yamaha have produced a new 16-key wind controller with a switchable

"...common to both the EX5 and 5R models is a massive 126-voice polyphony..."



fingering system, enabling it to use WX11, flute-style or sax-style fingering. Two new high keys, similar to those on a sax, have been added, and there's a direct MIDI output as well as the more usual WX output. Controller information is generated by both breath and lip sensors, and there's also a traditional pitch-bend wheel set in the underside. Improvements have been made to the electronics to reduce false triggering, and the system comes complete with mouthpiece cover, strap, WX cable, an additional recorder-type, reedless mouthpiece, and a soft case.

SOS

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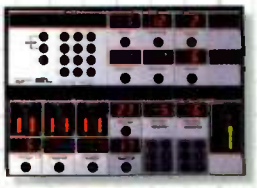
If you want to look at equipment we'll send you some brochures...



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

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

One side of the switcher-equipped recording room.

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

Compare 6 mics by recording simultaneously to ADAT

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

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

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

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

Huge range across Mac, PC and Acorn platforms.

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.

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DREAM RECORDING PACKAGES AT DREAM PRICES

Soundcraft & ALESIS

GHOST CONSOLE

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

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

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

RRP ~~£6729~~	RRP ~~£7469~~	RRP ~~£7575~~	RRP ~~£8327~~
£4299.99	£4699.99	£4799.99	£5299.99
GHOST 24 LE + ADAT XT	GHOST 24 + ADAT XT	GHOST 32 LE + ADAT XT	GHOST 32 + ADAT XT
ALL PACKAGES INC FREE LOOMS	ADD £399.99 FOR 24ch METER BRIDGE	ADD £499.99 FOR 32ch METER BRIDGE	ADD £1499.99 FOR 2nd ADAT XT

ADAT XT DIGITAL MULTITRACK RECORDER

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

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

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

digidesign

NEW

Digidesign have added a high performance 24 bit system to their ProTools range of products. The new D24 PCI-bus audio card is based on the Motorola 56301 processor, and increases the audio tracks from 16 to 24 per card. There is also an updated 888 interface with 24bit A/D & 20bit D/As, multiple 888s enabling up to 72 channels of discrete analog or digital I/O. They have also reduced the price of the standard ProTools from ~~£7,131~~ to £4,445 and ProTools Project from ~~£2,137~~ to £1,879

DSP FARM REDUCTIONS & FREE PLUG-INS WHEN PURCHASING PT24

ProTools 24 & G3 Pack

- G3/266 32/4000CD, ZIP & Keyboard
- Apple Multiscan 720 Display
- ProTools24 Core System
- 888/24 Interface
- PCI SCSI Accelerator
- 4Gb External Barracuda Hard Drive

NEW G3 PACKAGE £9999.99 INCLUDING INSTALLATION £11,749 INC VAT

ProTools 24 & 9600 Pack

- 9600/200 32/4000CD & Keyboard
- Apple Multiscan 720 Display
- ProTools24 Core System
- 888/24 Interface
- PCI SCSI Accelerator
- 4Gb External Barracuda Hard Drive

9600 PACKAGE £9999.99 INCLUDING INSTALLATION £11,749 INC VAT

ProTools Project

PROJECT £2195.99 £2,579 INC VAT

- Protools Project
- 882 Interface

ProTools III

PROTOOLS III £5495.99 £6,457 INC VAT

- ProTools III Core
- 888 Interface

ProTools Plug-ins

t.c. tools £775.99

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

Dolby Surround Tools £1339.99

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.

Focusrite D2 £880.99

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

Antares Auto-Tune £580.99

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

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

QUESTED

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

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

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

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

F11 SELF POWERED MONITOR

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

NEW PRODUCT £1149.99

VS2205 SELF POWERED MONITOR

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

NEW PRODUCT £1699.99

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DON'T MISS THE TUBE!

AKG

AKG's reputation in microphone manufacture is second to none. Over the past fifty years they have brought us such classics as the C414, the D12, and the legendary C12 valve mic. Whilst many other smaller manufacturers have rushed to take advantage in the resurgence of interest in valve mics, AKG have taken a long hard look at the market, and spent many hours at the drawing board, before coming up with the final design for the brand new Solidtube.

Ultra high quality components have been specified throughout, and construction is of the precision level engineering that you can expect from an AKG professional product. The Solidtube has a fixed cardioid response, ideal for studio recording of vocals and many instruments. Also present are a switchable 20 dB pad to prevent preamp overload from high level sources, and a high pass roll-off filter to eliminate rumble transmitted through the stand, as well as any other low frequency nuisances.

Included with every Solidtube is a high tension power supply, pop shield, custom designed suspension mount, all connecting cables, and a thoroughly constructed flightcase to protect your investment. For a limited period only, we are also including a boom microphone stand free of charge. All you need provide is the voice!

SOLIDTUBE STUDIO MICROPHONE

And the sound! The Solidtube's smooth frequency response and large size diaphragm, together with the superb tube circuitry provide one of the silkiest sounding mics we've ever heard, at any price.

Initial stocks will be very limited, so get your order in early to avoid disappointment - banish dull and lifeless acoustic tracks forever!

INCLUDES FREE BOOM MIC STAND

- *Affordable Valve Technology from AKG*
- *Constructed with Superb Attention to Detail*
- *Suited to Recording a Wide Variety of Sources*
- *Full Set of Accessories Included as Standard*

NEW PRODUCT
£799.99

THE UK 4 TRACK CENTRE

Our famous 4 track pack includes everything you need to start making music. Mackie headphones, a dynamic microphone, a chrome tape, cables, head cleaning kit and the best book we've yet seen on multitrack recording, taking you through basic track laying, mixdown etc... with sections on everything from mic placement to synchronisation and MIDI. We've obtained some great 4 track pricing and for a limited period, we will give you the 4 track pack (normal price £59.99) absolutely free when you purchase any of these multitrack recorders.

PORTASTUDIOS — TASCAM

PORTA 02

NEW PRODUCT
£149.99

ALL MULTITRACKS INC '4 TRACK PACK' ADD £10 FOR PORTA 02

RRP £349
£329.99

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, inventors of the portastudio. Features include 3 band EQ with a mid sweep, records to all 4 tracks at once, 2 independent auxiliary sends (1 switchable pre/post fade). Logic controlled 2 speed transports with locate memory location points, DBX noise reduction, initial supplies limited.

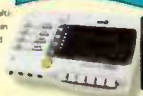
~~RRP £499~~
£429.99

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

Fostex

X-14

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



RRP £149
£129.99

XR SERIES MULTITRACKS

XR3

High speed machine at under £250! New auto-bounce facility and built in mic - ideal for 4 track recording on the move.

RRP £249
£219.99

XR55

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

NEW PRODUCT
£379.99

XR77

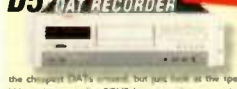
The XR7 breaks new ground in price and performance - 6 inputs (2 mics), 2 separate aux sends, lowrite glide sweep mid EQ. Records up to 4 tracks at once - double speed transport, Dolby C. 2 XLR mic inputs.

NEW PRODUCT
£499.99

D5 DAT RECORDER

HALF PRICE

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



RRP £1299
£599.99

DA20MkII DAT MACHINE — TASCAM

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

RRP £699
£549.99

DA30MkII DAT RECORDER

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

RRP £1299
£965.99

102MkII & 202MkIII TAPE DECKS

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

RRP £249
£199.99

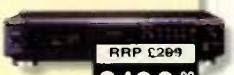
RRP £349
£269.99

DTC-A8 DAT RECORDER — SONY

Turnkey have done it again! A pro, full spec DAT machine at a bargain price! Just look at the list of features: SPDIF coaxial and optical ins and outs, digital and analog recording (on 1/4" tape) at all three sampling rates (32 kHz, 44.1 kHz, 48 kHz), full 19" rackmount, as well as all the usual ID functions and a full function infra red remote control, and optional footswitch 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 £899
£499.99

MDS-JE510 MINIDISC RECORDER



Although DCC looks to have died as a format now Minidisc is thriving, and rapidly becoming a standard in radio stations and other institutions around the world. With sound quality almost as good as DAT, and a range of editing features like Combine, Move, and Auto 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
£199.99

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 £399
£219.99

SV3800 — Panasonic

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, 64x oversampled (equivalent to 20 bit), you can be sure of the highest possible sound quality. Records and plays back on 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
£895.99

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

DMT-8 VL DIGITAL MULTITRACKER — Fostex

INC '4 TRACK' PACK

The personal digital multi-track is here at last, and at a price you won't believe! 8 separate tracks of CD quality audio recorded to half-gig hard-disk (up to 12 minutes). Record 2 tracks simultaneously, jog shuttle audio and sync to MIDI without losing a track. The 8 channel mixer accepts 2 mics, with a 2 band EQ and 2 aux sends. Separate outputs and SPDIF optical output. Why buy 4 tracks when you can have 8!!

RRP £1208
£799.99

MT50 MULTI-TRACKER — YAMAHA

BOTH INC '4 TRACK PACK'

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

RRP £389
£269.99

MT4X MULTI-TRACKER

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

RRP £569
£369.99

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Roland

VS880 DIGITAL WORKSTATION

Roland's VS880 has become the de-facto standard for compact digital eight track recording, hardly surprising with it's combination of great sound quality, compact size, and excellent feature set.

Each of the 8 tracks has 8 virtual tracks, allowing you to record several different takes, and then compare them afterwards, even if you've already recorded on the other 7 tracks. The built in digital mixer can handle up to 14 channels, features 2 band parametric EQ, 1 external and 2 internal aux sends (to the optional FX board), and is fully automatable over MIDI. The SCSI port allows the connection of external SCSI devices for recording or backup, which can also be made to DAT via the digi i/o. There's not even any need for a separate synchroniser, as it puts out MTC as standard to sync up your sequencer.

New version 2 software not only allows automation data to be recorded directly to the hard drive for total integration, but also brings numerous new effects to the optional board, including COSM based mic emulation - make your SM58 sound like a U87! Existing owners can upgrade to version 2 for only £49.99.

To offer a completely integrated solution, we are bundling the VS880 with a 1.4 gig hard drive and mounting kit, and the FX board together. These would normally have a combined retail price of £2238, but for a limited period only all this can be yours for only £1499.99!

- Digital Mixer with Full Automation
- Totally Integrated Solution
- Built in MIDI Sync
- 64 Virtual Tracks
- Built in Effects

~~RRP £2238~~

£1499.99

INCLUDES 1.4Gb HD, MOUNTING KIT & FX BOARD

MDMX4 DIGITAL MULTITRACKER

OVER 40% OFF — SONY

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.

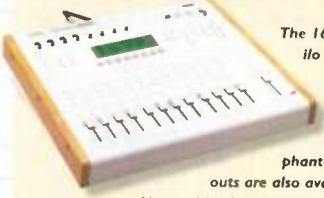
Stocks are very limited on this exclusive deal - order now!

~~RRP £999~~

£599.99

SOUNDLINK 168RC DIGITAL MIXING CONSOLE

OVER 45% OFF ! — KORG



The 168RC features 16 digi ilo in the ADAT optical format, as well as eight analogue mic/line inputs, two of which have phantom power, master outs are also available as SPDIF.

Also available from Korg are high quality external 8 channel A/D and D/A convertors in ADAT format for more analogue connections, and you can cascade multiple 168RC's together for unlimited channels!

Internally, the 168RC has 8 subgroups, 3 band parametric EQ 2 external and 2 internal aux sends. The internal sends go to 2 high quality effects processors with some of the finest algorithms around, including reverb, delay, distortion, pitch shift, dynamics processing and even speaker simulation.

For automation, up to 100 'scenes' can be stored internally, taking a snapshot of every single parameter of the desk, which can then be recalled at the touch of the button, and in addition to this all parameters can be dynamically controlled in real time via MIDI.

All in all, a tour de force product with far too many features to detail here.

Call now for a demo!

~~RRP £1899~~

£999.99

DPS12 DIGITAL MULTITRACKER

AKAI

NEW PRODUCT

£1299.99

PDR-04 CD RECORDER

PIONEER

~~RRP £699~~

£499.99

PDR-05 ALSO AVAILABLE with sample rate conversion ONLY £599.99

CDR870 RE-RECORDABLE CD WRITER

PHILIPS

NEW PRODUCT

£449.99

HD-S200 PORTABLE DAT RECORDER

aiwa

OVER ONE THIRD OFF!

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

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

Very limited stocks - grab your once in a lifetime bargain now!

~~RRP £599~~

£369.99

DR-16 HD MULTI-TRACK RECORDER

INC FREE 4GIG HD & VGA BOARD — AKAI

First there was the DR4, then the DR8, and now Akai bring you 16 tracks of no-nonsense 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 4 gig hard drive and VGA board!

~~RRP £4199~~

£3699.99

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

MULTITRACKS NEW, USED & EX DEMO

AKAI DR16 ..... £2299.99	FOSTEX D90 ..... £1199.99	SONY TCKE200 ..... £99.99
AKAI IB302D £249.99	JL COOPER DATAMASTER £369.99	TASCAM 112MK2 ..... £399.99
AKAI IBM20T £149.99	JLC CUEPOINT £269.99	TASCAM DA30MK2 ..... £999.99
ALESIS BRC £999.99	MARANTZ CD46/PRO .. £119.99	TASCAM DA50MK2 DEMO £3299.99
CASIO DA7 DAT £549.99	SONY DTC690 ..... £299.99	TASCAM 424 MK1 DEMO£299.99
FOSTEX D15 DAT £2149.99	SONY DTC790 ..... £369.99	TASCAM DA88 ..... £2399.99
FOSTEX D80 ..... £999.99	SONY MDSJE500 ..... £169.99	TASCAM RC848 ..... £899.99
FOSTEX 380S DEMO... £399.99	SONY PCM800 DIGITAL 8 TRACK £1999.99	YAMAHA MU90R £349.99
FOSTEX CX8 DIGITAL 8 TRACK £1299.99	SONY TAFE200 TAPEDECK.. £98.99	YAMAHA RY20 ..... £249.99

*We will not be undersold on genuine quote from a UK or European dealer at the time of order. We must be able to substantiate the quote and be exactly like-for-like, available and in stock. Prices include 17.5% VAT. Ex rental catalogue from £9.99. Please allow 10 working days for cheque clearance. E&OE & subject to status.

Authorised Dealer Soundcraft DRAWMER MACKIE Roland SONY TASCAM FOSTEX digidesign

EUROPE'S LOWEST

ZOOM A JOURNEY TO THE MOON!

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

1201 TRUE STEREO FX PROCESSOR

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

NEW PRODUCT **£95.99**

- *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 original 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 **£199.99**

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

THC-00 RESINATOR — FAT

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

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

NEW PRODUCT **£199.99**

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 **£299.99**

Order now and own an instant classic!

DIGITAL PROBLEM SOLVERS — FRIEND-CHIP

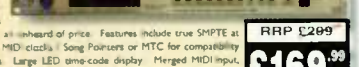
In today's increasingly digital world, many people are still using their equipment's analogue ins and outs, because of the difficulty of interconnection and synchronisation. Friend Chip's new sensibly priced digital patchbays and 'black box' problem solvers end the misery and make the digital studio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

Also in the range:

OP-CON: optical to co-axial and vice versa	£69
PRO-CON: SPDIF to AES/EBU and vice versa with SCMS stripping	£129
0 4-2 COPY CON: switcher with 1 optical & 3 co-ax ins, 2 co-ax outs and SCMS stripping	£99
SR44.1: converts almost any incoming sample rate to 44.1kHz (ideal for ProMix01 and non 44.1 DATS)	£149
SRC/W: 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 synchronous SPDIF signal	£129
ADAT Audio Clock: ADAT 9 Pin to word clock, Super Clock and SPDIF clock convertor	£129
ADAT Word Clock Synchroniser: ADAT 9 Pin to word clock and Super Clock convertor, also sends MTC (synchronize your sequencer) with MIDI merg	£199
ADAT SPDIF Synchroniser: as above but with converts only to SPDIF	£199
ADAT MIDI Machine Control: MIDI to ADAT 9 Pin convertor with MIDI thru (add to either of the above for full remote ADAT control from your sequencer)	£69
Rack Kit: holds up to three 'black boxes'	£49

FROM **£69.99**

XR300 SYNCHRONISER — TURNKEY EXCLUSIVE — XRI Systems



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

RRP ~~£299~~ **£169.99**

VC3 PRO CHANNEL — JOEMEEK

Legendary sixties producer Joe Meek was often asked the secret of his fantastic vocal sound. It was in fact a custom made 'black box' of electronics, whose contents he would not reveal during his life. Now JOEMEEK bring his designs to life, and with knobs on! In addition to the compressor and high headroom mic amp, controls like Drive, Enhance and Q make the VC3 one of the hottest ways to get your signal down. ***Incredible low price - order yours today!***

RRP ~~£249~~ **£149.99**

COMPOSER WORKHORSE COMPRESSOR — BEHRINGER

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

RRP ~~£349~~ **£169.99**

MODEL 316 SEMI-PARAMETRIC EQ — speck electronics

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

RRP ~~£799~~ **£249.99**

MIDIVERB 4 PRO QUALITY FX UNIT — ALESIS

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

RRP ~~£329~~ **£249.99**

STUDIO QUAD 4 CH. STUDIO FX PROCESSOR — DigiTech — NEW LOW PRICE!

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

RRP ~~£529~~ **£329.99**

VTP-1 DIGITAL MIC PRE — DigiTech

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

NEW BOXED **£999.99**

VCS1 COMPRESSOR

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

RRP ~~£799~~ **£429.99**

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

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

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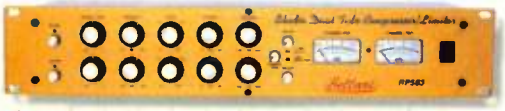
PRICES GUARANTEED*

Bellari

PREMIUM QUALITY VALVE OUTBOARD EQUIPMENT

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



The RP583 Studio Tube Compressor / Limiter

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

NEW PRODUCT £499.99 FACTORY DIRECT

RP533 Studio Tube Multi-Processor

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

NEW PRODUCT £499.99 FACTORY DIRECT

RP520 Studio Mic Pre Amp

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

NEW PRODUCT £399.99 FACTORY DIRECT

RP562 Stereo Exciter

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

NEW PRODUCT £299.99 FACTORY DIRECT

ADB3 Stereo Direct Box

Stand alone 2 channel tube DI box.

NEW PRODUCT £129.99

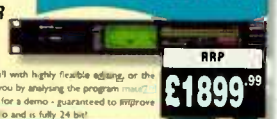
MP110 Direct Drive Mic Pre Amp

Stand alone single channel tube mic pre amp.

NEW PRODUCT £169.99

FINALIZER 2 MASTERING PROCESSOR

t.c. electronic



Brings top professional quality mastering tools to the project studio. 5 band stereo EQ. De-esser. Digital Radiance Generator™. Normalizer, and Dynamics, all with highly flexible editing, or the option to let TC's Wizard do the work for you by analysing the program material automatically. Analog and digital I/O, call us for a demo - guaranteed to improve your masters! New Finalizer 2 has ADAT I/O and is fully 24 bit!

RRP £1899.99

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

MIKEMAN MIC PRE-AMP

The Mikeman is a dual channel, high definition mic preamp featuring up to 72dBs of gain, allowing the noise free amplification of even the lowest input signals. The unique design of the phantom power supply, gives a precise 48v output, alleviating the problem of 'phantom drift' the source of so many problems, particularly when using older or tube microphones. Uniquely the Mikeman has a facility to split a single input into two outputs and features individual controls for gain, phase reverse, phantom power and a -35dB pad. We don't expect to have these long!

RRP £349 £179.99

4 POLE FILTER

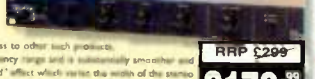
waldorf

The 4 Pole is the legendary Microwave I Wave 24 dB lowpass filter. You are free to apply this filter to any audio signal that you perch into the Filter. So if your favourite sampler or sample player lacks that special quality, you can give it a sonic boost via the 4 Pole Filter.

It is the most powerful (and quite possibly the only) analog filter available today!

NEW BOXED £269.99

VITALIZER STEREO JACK ENHANCER/EXCITER PROCESSOR



The Vitalizer has always been considered to be the Rolls Royce of enhancer / exciter processors. Using a significantly different process to other such products, the effect deals with the full frequency range and is substantially smoother and richer. Also included is a "surround" effect which varies the width of the stereo field. Massive bulk purchase allows this unbelievable price - check one out now - we guarantee you'll be impressed.

RRP £299 £179.99

X POLE FILTER

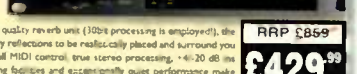
What do you get if you take two of Waldorf's 4 pole filters, put them in a rack and spice it up? The all new X-Pole! Maintaining all of the 4 Pole's great sound, MIDI and tactile controllability, the X-Pole allows you to treat two mono signals independently, or the two channels can be linked together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

NEW PRODUCT £439.99

SRV-330 REVERB UNIT

UNDER HALF PRICE!

Roland



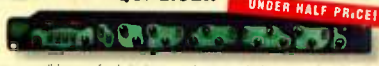
This incredible unit from Roland uses the technology developed for their £24,000 RSS system. As well as being an ultra high quality reverb unit (30bit processing is employed), the 3D technology allows early reflections to be realistically placed and surround you in a 360 degree circle. Full MIDI control, true stereo processing, 4-20 dB ins & outs, a wealth of editing facilities and exceptionally quiet performance make this an irresistible buy. ***Very limited quantities at this bargain price!***

RRP £859 £429.99

FOCUS EQ PARAMETRIC EQUALISER

Focusrite

UNDER HALF PRICE!



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 out board, at a fraction of the original cost. The Focus EQ features an ultra high quality mic preamp complete with phantom power and phase reverse, as well as line and instrument level inputs, making it an excellent recording channel, or even a top quality preamp for bass or acoustic guitar. In addition to the four parametric EQ bands, there are also variable high and low pass filters, and the EQ and filters each have their own bypass switches. Typical Focusrite build quality can be taken for granted, as can some of the best sounding EQ you've ever heard. Very limited quantities available for this exclusive deal - order now or regret forever!

RRP £939 £399.99

The Dual Mic Pre - an audiophile quality dual channel mic preamp. *New low price - over 50% reduction!* £399.99

The Quad Compressor - an audiophile quality four channel compressor. £849.99

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! £799.99

The Compressor - highly versatile compressor with hard & soft knee types, separate limiter and gate and built-in sidechain filters. £849.99

The Channel Strip - similar to the Voicebox, but also features line level inputs and extra EQ. £899.99

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

EQ1 Parametric EQ

UNDER HALF PRICE! TL Audio

TLA's range of outboard must be the best selling valve gear ever! Their classic warm valve sound, combined with the low noise floor that modern digital recording demands have made them a huge success story. Our tremendous buying power now allows us to offer the superb EQ1 at this incredible price. The EQ1 is a dual 4 band (or single channel 8 band) parametric EQ - a high performance transformerless pre amp is followed by four valve stages per channel, which provide a fine and gradual overdrive characteristic, and a frequency response which is virtually flat from 20Hz to 40kHz. *Limited quantities only at this price!*

RRP £821 £369.99

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

REFLEX EFFECTS PROCESSOR

UNDER HALF PRICE! lexicon

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.

Limited stocks only - first come, first served!

RRP £469 £199.99

362 SONIC MAXIMIZER

BBE

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

RRP £199 £149.99

362NR SONIC MAXIMIZER & NOISE REDUCTION only £179.99

362SW SONIC MAXIMIZER & SUB WOOFER CONTROL only £169.99

OUTBOARD NEW, USED & EX DEMO

ALESIS MICROVERB4	£169.99	BELLARI RP583 £349.99
ALESIS QUADRAVERB 2	£349.99	DBX 1066 £299.99
ALESIS WEDGE	£289.99	DBX 1086 £329.99
AMEK 9098	£949.99	DIGITECH TSR6 £149.99
AMEK 9098CL	£1199.99	FOCUSRITE GREEN COMP £799.99
AMEK 9098DMA	£899.99	JOEMEEK STEREO COMPRESSOR £1049.99
APHEX 651	£199.99	
BELLARI RP533	£349.99	

LA AUDIO GX2 £99.99
MUTRONICS MIDI MUTATOR £499.99
SPEC EQ316 £299.99
YAMAHA REV500 £249.99
ZOOM 1202 £79.99

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

KORG ensoniq AUDIS Steinberg Yamaha Technics Vestax FATA

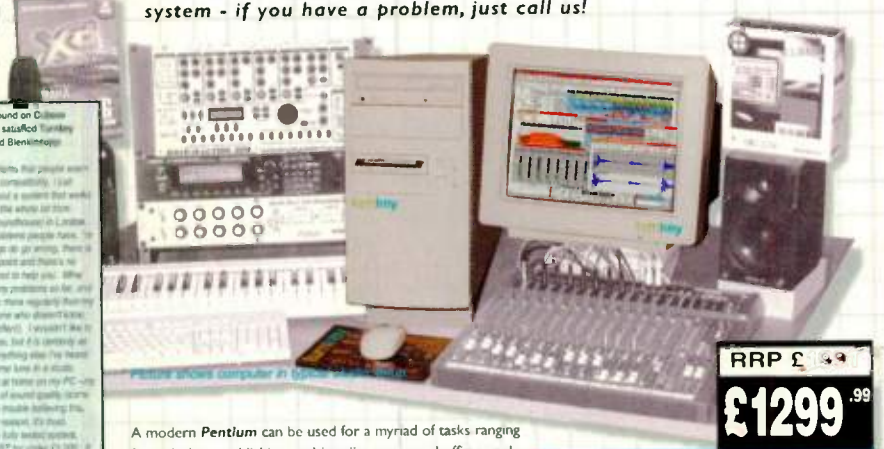
EUROPE'S LOWEST

turnkey PRO TECH

THE TURNKEY PRO TECH PENTIUM: A TOWER OF STRENGTH

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

MMX intel inside pentium



Genuine Email found on Cubase newsgroup from satisfied Turnkey customer Richard Blenkinsopp:

"[...] all the problems that people seem to be having with computers, I just thought I'd tell about a system that works fine. You can get the whole lot from Turnkey (Turbo Soundhouse) in London. Looking at the problems people have, I'm glad I did. If things do go wrong, there is only one contact point and there's no excuse for them not to help you. [...] has not caused any problems so far, and in fact crashes no more regularly than my Atari did (for anyone who doesn't know, that wasn't very often). I wouldn't like to quote noise figures, but it is certainly as good quality as anything else I've heard. I recorded the same tune in a studio using ADAT, and at home on my PC - my PC won in terms of sound quality, some people may have trouble believing this, but for what ever reason, it's true! Turnkey supply a fully tested system, which includes VAT for under £1,200. It doesn't include all the usual bundled junk that normally comes with "high street" PC's, so if you want to thank Bill Gates for that lovely bundled software, you'll have to add the cost of a decent word processor, but for music it's great. They do plenty of options for larger hard drives, more RAM, a faster processor, CD-R's soundcard etc. If that's what you need, but my humble P166 works fine with upto 20 tracks of digital audio, perfectly timed with MIDI tracks. PS - I don't work for Turnkey!"

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

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

PACKAGE PRICE TABLE	16 bit full duplex & SW60	Fiji & DB50	Digi. Fiji & DB50	Pinnacle & DB50	Digi. Pinnacle & DB50
Digital Orchestrator Plus	£1239.99	£1499.99	£1549.99	£1549.99	£1469.99
Steinberg Cubase VST	£1299.99	£1599.99	£1649.99	£1699.99	£1769.99
E-magic Logic Discovery	£1269.99	£1529.99	£1569.99	£1599.99	£1689.99
E-magic Logic Audio	£1449.99	£1729.99	£1759.99	£1799.99	£1889.99

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

RRP £~~1499~~ **£1299.99**

CUBASE VST STARTER PACK

- Intel Pentium 200mmx (opt. 233 etc)
- 512k L2 cache RAM
- 32 Mb RAM (optional 48 Mb, 64 Mb)
- 2 Gb HD (optional 4 Gb, 6 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

P233mmx package with 4 gig HD only £1499.99!

RRP £~~1861~~ **£1099.99**

P200 PC PACKAGE AS ABOVE BUT WITH CAKEWALK V5.0

MU10 GM SOUND MODULE

YAMAHA

OUT OF THIS WORLD MEGADEAL!

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

INCLUDES CUBASIS

The MU10 comes in a handy module format which means there's no need to open up your computer, no IRQ conflicts or DMA problems, you just connect it to the serial port of your Mac or PC (cable included). What's more its MIDI in and out ports means it also acts as a MIDI interface, and it can be used as a stand alone module without a computer!

The 34 built-in effects can be used not only with the built in sounds, but also with any external signal (eg your voice, guitar etc) via the stereo audio input. The MU10 comes with the CD-ROM version of Steinberg's famous Cubasis MIDI sequencing software, and this incredible offer includes Yamaha's XgEdit editor free for detailed editing of the onboard sounds.

A complete starter kit for anyone looking to get into making music.
This exclusive offer is only available whilst stocks last - get your order in now!

Package available with Peak Studio 37 MIDI key music MI 808 touch sensitive keys), microphone, headphones and cables only: **£169.99**

RRP £199 **£115.99**

CAKEWALK PRO

CAKEWALK

OVER 60% OFF PRICE

Cakewalk has been the US #1 sequencer for ever. For a limited period, we are offering Cakewalk Pro v5.0, with 4 discrete audio tracks and 256 MIDI tracks for £79.00. That's less than the price of Cakewalk Home Studio! Upgrade option to Pro 6 (£49.99) or Pro 6 Audio (£109.99).

(Comes on CD-ROM. Also includes v4.5 for Win3.1)

Cakewalk Pro 5 + MIDIMan Dman £229.99
Cakewalk Pro 5, MIDIMan Dman + DB50 £335.99
Cakewalk Pro 5 + laptop MIDI interface £149.99
Cakewalk Pro 5 + Pentium package £999.99

RRP £199 **£79.99**

SIBELIUS-7

TOP-END NOTATION V3.5

Sibelius

Why do so many music academies use a program which doesn't work on the PC or Mac? Because for professional notation type writing, nothing else comes close. "In a totally different league from anything else" - Paul Patterson, Royal Academy of Music. Interex 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 for a DEMO. One to one tuition also available upon request.

FROM ONLY **£499.99**

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 pre pro could stretch so far as buying it, and with its extremely powerful but complex user interface, many beginners were put off. With Finale 3.7 now retails for just £499.99 (£249.99 for Academic Users), and new upgrade is radically redesigned user interface and extensive manuals. If you're looking for score fodder "Pavane" or Stockhausen's "Gruppen", Finale contains all the features you'll need!

RRP £699 **£499.99**

MUSIC AT PASSPORT

NOTATION / COMPOSITION

PASSPORT

Musicatime 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 "FlashWrite" facility which allows notes to be sung or played into the program using a microphone. A "piano score program" such as this offers the cleanest and most intuitive user interface, since the program revolves around the score, which is always displayed on the screen. Advanced facilities such as part extraction are included, and the program handles transposing instruments with ease. Includes Internet Explorer free!

RRP £129 **£89.99**

BAND-IN-A-BOX

INTELLIGENT ARRANGER V7.0

PG music

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

FOR PC WIN (v5.0) & ATARI (v5.0)

#1 SELLER **£89.99**

MIDI INTERFACES

FOR PC COMPATIBLES

INTERFACES

Datapoint Cable (fits any Soundblaster™ type card)	£25.99
MIDI Link	1 in, 1 out serial interface for notebooks £39.99
MPC401-4	1 in, 1 out MIDI card with Wavetable £82.99
Windows 1x1	Works easily with your existing sound card £39.99
Windows 2x2	2 in, 2 out MIDI card for Windows only £79.99
Parallel 2x4	2 in, 4 out parallel interface for notebooks £119.99
MIDI Edge 1x4	1 in, 4 out MIDI card with Wavetable £129.99
Windows 4x4	4 in, 4 out MIDI / SMPTE card for Windows £179.99
Parallel 4x4	as Windows4x4 except for Parallel port £179.99

16 BIT DUPLEX

DIGITAL AUDIO RECORDING

midiman

This 16 bit card has much lower noise levels than similarly priced cards, and allows full duplex recordings on fast 486 or Pentium computers. Used with Cubase VST, Digital Orchestrator, Sound Studio Gold etc... Built in MIDI interface (cable included in the price), and connector for optional synthesiser daughterboard.

Really really easy installation with Win95 (Plug 'n' Play). After putting the card in, switch the PC on, and insert the disk when prompted. Takes about 90 seconds! (a bit longer if you already have a sound card).

Buy with Cubase £399.99, with Digital Orchestrator £275.99

RRP £249 **£149.99**

CUBASE VST FOR PC!

CUBASE

Steinberg

The industry standard MIDI sequencer is now even better value than ever! Version 3 now includes full hard disk recording facilities as on the Mac (that starts with virtually no soundcard!

Get £50 off Score version at only £449.99

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 £449.99***

RRP £329 **£279.99**

MIDIQUEST 6.0

UNIVERSAL PC EDITOR LIBRARIAN

Sound Quest

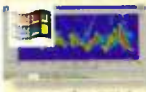
MIDIQuest is the most powerful, flexible and comprehensive editor librarian around, with support for the widest range of MIDI devices including XP50 (v1.00 owners, Morpheus / UltraProteus, MU50, MU80, Quadraverb Plus / GT, Classic Keys, TD-7, KT76 / KT88, Korg X5, DPM3 and many others. Driver upgrades are generally free of charge, so MIDIQuest will last for as long as MIDI is around! It's a really good investment. Now version comes on CD-ROM and is fully Windows 95 native (its 32 bit

RRP £235 **£199.99**

SOUND FORGE 4

PC SOUND EDITOR

ALSO SOUND FORGE XP £119



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

RRP £499 **£349.99**

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, these still in existence are collector's items. They'll cost you an arm and a leg, which has spawned 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 **£139.99**

We will beat any genuine quote from a UK or European dealer at the time of order. We reserve the right to withdraw this offer without prior notice. Prices correct at time of going to press. Subject to availability. E&OE. All trademarks acknowledged. Prices include 17.5% VAT. Delivery from £9.99. Please allow [illegible] working days for delivery. Some items may be subject to a delivery charge.

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PRICES GUARANTEED*

turtle beach

A DIGITAL HURRICANE IN YOUR PC?

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

DMA

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.

FREE DIGITAL ORCHESTRATOR PLUS WITH PINNACLE (WORTH £129)

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

CUBASE VST £549.99 PACKAGE WITH FIJI

CWALK PRO AUDIO 6 £599.99 PACKAGE WITH FIJI

LOGIC AUDIO £649.99 PACKAGE WITH FIJI

ADD £75 FOR PINNACLE INSTEAD OF FIJI
ADD £99.99 FOR S/PDIF DIGITAL I/O

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... (£99.99 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.

FIJI £299.99

A PINNACLE WITHOUT SYNTH & SAMPLESTORE
ALSO INC. FREE DIGITAL ORCHESTRATOR SE

PINNACLE £375.99

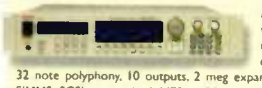
INC. FREE DIGITAL ORCHESTRATOR PLUS

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

S3000XL WORKHORSE SAMPLER

INC FREE ZIP DRIVE & 32 MEG

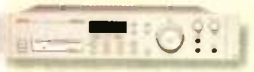
AKAI



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

RRP £1799 £1499.99

S2000 SAMPLER



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

Now bundled ... & SCSI interface ... pass CD-ROM drive, ZIP drive and 8Mb of RAM (all the essential parts of any) £999.99

RRP £999 £799.99

We endeavour to keep all AKAI expansion boards in stock at all times, including those for the more obscure and discontinued models. Here are some examples of ways to get the maximum out of your sampler or hard disk recorder:

IB208P	8 outputs & digi i/o for S2000	£249
IB304F	2nd filter board for S2000/S3000XL	£299
EB16	multi FX board for S2000/S3000XL	£299
EXM3008	8 meg expansion for S2800/S3200/S3200 CD3000	£399
EXM008	8 meg expansion for S1000/1100	£399
IBM208P	8 outputs & digi i/o for MPC2000	£249
IB807V	monitor output board for DR8/DR16	£499
IB804AEX	8 in 16 out ADAT interface for DR16	£399
IB803M	MIDI interface for DR8/DR16/DD8	£199
IB802T	SMPTE board for DR8/DR16/DD8	£249

S20 SAMPLER

All new sampler from the makers of the industry standard, the S3000, brings quality sampling to a new affordable level. 16 bit sampling gives great quality, and the standard 1 meg memory is expandable to 17 meg, giving up to 18 minutes sampling time dependant on the sample rate used. Built in sequencer means you can build up grooves without the use of a computer, and the special auto loop tempo mode makes BPM calculation a doddle. The 1.44 meg disk drive reads floppies from virtually all Akai samplers giving you instant access to a huge library of sounds. *Initial stocks are very limited - get your order in now.*

RRP £499 £479.99

MPC 2000 SAMPLING DRUM MACHINE

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

RRP £1199 £1149.99

INC FREE 8 MB RAM

E6400 SAMPLER

INC FREE 16 MEG & 5 CD-ROMS!

EMU

Building on the success of the E64 comes the E6400 from EMU. As well as coming with 4 meg of RAM as standard, and all the features of version 2 software, expandability is unrivalled with options including an extra 8 outputs, 32 MIDI channels, 18 bit dual stereo FX processors, and up to 128 note polyphony! Huge EMU CD ROM library available at Turnkey.

RRP £2499 £1699.99

ZIP REMOVABLE DRIVE

INC DISK & 25 PIN SCSI CABLE

IOMEGA

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

RRP £219 £149.99

SP202 SAMPLING UNIT

BOSS

More functionality than the original Fairlight for under £300! The SP202 offers 16 bit sampling with sample rates up to 32 kHz, giving a maximum of 4' 20" sampling time, or 37 using optional PCMCIA memory cards. Features like timestretch, filter, delay and ring modulation mean the machine has to be taken seriously, and the built in automatic BPM calculator, together with tap tempo function, is a godsend for loop merchants. The built in mic and battery operation (optional PSU available) make it great for sampling on the move. Ideal for DJ's or anyone needing sampling on a budget, initial stocks will be very limited - get your order in early!

RRP £399 £299.99

ESI4000 NEW SAMPLER

INC FREE 16 MEG - 5 CD-ROMS ONLY £20 EXTRA!

The ESI4000 has all the features of the ESI32 we have come to know and love, but now has 64 note polyphony, memory capacity of up to 128 meg, and an operating system upgrade giving you E4 style multi mode filters. All E-mu samplers come with free access to our enormous sample library (we have all the EIII library on CD-ROM) and of course, excellent technical support. Also available with the fantastic Calamari Turbo board pre fitted for only £1249.98! Initial stocks are very limited - call to reserve yours now!

RRP £1199 £949.99

PROTECH 12x CD-ROM DRIVE

PRO TECH

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

NEW PRODUCT £169.99

SU10 SAMPLING UNIT

INC 2 FREE TIME & SPACE CDs

YAMAHA

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

RRP £299 £249.99

ALSO AVAILABLE WITH 3 OCTAVE MIDI KEYBOARD only £319.99

CALAMARI ESI4000 TURBO EXPANSION BOARD

The upgrade all ESI owners have been waiting for! For only £299.99, you get six extra outputs giving a total of ten, two simultaneous FX processors, and a plethora of new filter types taken from the E4x. Unbelievable value for money - every ESI owner should have one!

RRP £369 £299.99

When purchased with the ESI4000

COMPUTER NEW, USED & EX DEMO

3GIG IDE DRIVE ... £49.99	APPLE 7300/200 PPC ... £999.99	... £169.99
9GIGIDAT DRIVE ... £309.80	APPLE 9600/200 PPC ... £1749.99	EMAGIC LOGIC PC ... £219.99
8 SPEED CD ROM ... £89.99	DIGIDESIGN AUDIOMEDIA 2	OPCODE MAX SOFTWARE
9GIGIEXTERNAL DRIVE £499.99	... £299.99	... £109.99
APPLE 630 ... £329.99	DIGIDESIGN DPP1 ... £99.99	STEINBERG CUBASE AUDIO PC
APPLE 6400/200 PPC ... £799.99	EMAGIC DISCOVERY AUDIO PC	... £469.99

SAMPLING NEW, USED & EX DEMO

AKAI MPC2000 ... £869.99	EMU E4K/VOICE EXPANSION	ROLAND DJ70MK2 ... £749.99
AKAI REMIX 16 ... £369.99	... £549.99	
EMU E4BOUT EXPANSION £429.99	EMU E64 ... £1,449.99	

SAMPLE LIBRARIES

Time+Space

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

Check one out today!

PRICES FROM £19.99

A3000 SAMPLER

YAMAHA

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

RRP £1299 £1099.99

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

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

EUROPE'S LOWEST

FOSTEX

D IS FOR DIGITAL!

Fostex dominated the home recording market in the 80's and early 90's with such classics as the Model 80, the A8 and the R8 8 track recorders. Now in the late 90's they have combined that wealth of experience, together with that of key New England Digital staff to bring you this superb range of digital multitracks, specifically designed for the project studio owner. Just check out the range!

DMT-8 VL
DIGITAL MULTITRACKER

INC '4 TRACK' PACK

The personal digital multi-track is here at last, and at a price you won't believe! 8 separate tracks of CD quality audio recorded to half-gig hard-disk (up to 12 minutes). Record 2 tracks simultaneously, jog-shuttle audio and sync to MIDI without losing a track. The 8 channel mixer accepts 2 mics, with a 2 band EQ and 2 aux sends. Separate outputs and S/PDIF optical output. Why buy 4 tracks when you can have 8!!

RRP £1208
£799.99

D80 HD RECORDER

INC 850 MEG HD

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

RRP £1499
£1099.99

D90 HD RECORDER

INC 1.3 GIG HD

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

RRP £1798
£1299.99

D160 HD RECORDER

INC 2.5 GIG HD

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

RRP £2982
£2099.99

- *Uncompressed Audio for True Digital Quality*
- *Removable Canister Drives for Easy Portability*
- *Jog / Shuttle Wheels on all Models*
- *Back up to DAT via Digital Ins and Outs*

VIRUS
VIRTUAL ANALOGUE SYNTH

access

Control specialists Access have used all their considerable expertise in the design of their new 'virtual analogue' synth, the Virus.

All major parameters have their own dedicated knob or switch, and an 'expert' mode allows super detailed editing via the LCD display and parameter controls. Of course, all edits send out controllers in realtime. Synthesis facilities are unparalleled - 64 oscillator waveforms (2 per voice), 3 LFO's, 2 mult-mode filters per voice, oscillator sync, filter overdrive, built in FX - you name it, it's got it!

12 note polyphony, 16 part multitimbrality, 6 outputs and 2 filter inputs mean you're not just limited to one sound at a time. We're so confident that you'll love this synth that we're offering a seven day money back guarantee (ask for conditions).

The most flexible and best sounding virtual analog on the market.

NEW PRODUCT
£899.99

SYNTH MODULES

EMU

ORBIT
PLANET PHATT
CARNAVAL

Emu have taken their wealth of experience in making [illegible] such as the Proteus, Vintage Keys and Morpheus, combined it with the filters from the incredible Emulator 4, and with their usual innovation, come up with the Orbit, Planet Phatt and Carnaval.
The Orbit is stacked full of classic drum sounds, pulsating basses, ambient pads, as well as a huge variety of hits and effects. Planet Phatt brings a new definition to swing, and the Carnaval is ideal for dance grooves as well as Latin specialists.
The inclusion of the E4's 16 different types of 6 pole filters mean that these models have more power and full filtering than any other synth. Finally the 'BEATS MODE' includes a wide selection of loops and grooves, which can have their pitch changed without tempo change and vice-versa, and even their sounds too!
V2 software now gives improved beats mode and other enhancements.
Orbit upgrade available for only £69.99.

RRP £869
£799.99

DEEP BASS 9
TB303 CLONE

Control Synthesis

UNDER HALF PRICE!

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

~~RRP £449~~
£199.99

QUASIMIDI

RAVE-O-LUTION 309
DANCE WORKSTATION

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

FACTORY DIRECT
£549.99

RACK EARS ALSO AVAILABLE only £25.99

309 AUDIO-EXPANSION

Four output expansion board now available only £149.99! 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
£149.99

POLYMORPH
SYNTHESISER

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

FACTORY DIRECT
£769.99

ATC-1
ANALOGUE MONOSYNTH

STUDIO ELECTRONICS

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

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

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

RRP £899
£469.99

JV1080
SYNTH MODULE

Roland

In the same way as the S1000 became the industry standard sampler, Roland's JV1080 has become the industry standard synth module. It's not hard to see the reason why - straightforward operation combined with top flight sound quality and a huge range of useable sounds.
But expandability of the machine is where it really comes into it's own. There are over 10 different expansion boards which can be fitted (up to 4 at once), each one with as much ROM as the original machine, covering sounds from Vintage to Orchestral and Dance to World. At Turnkey we have the full range in stock, as well as an unbeatable price on the machine itself. ***Expansion boards only £199.99 each!***

RRP £1199
£699.99

JV2080
SYNTH MODULE

The Roland JV1080 has been become the industry standard sound source for home studios and professionals alike. It's superb sound quality, 64 note polyphony and expandability were a winning combination.
Now the new JV2080 builds on that success by offering a giant editing screen, three independent effects processors as well as reverb / delay and chorus, and room for 8 of Roland's renowned expansion boards - the potential is virtually limitless! Judging by the success of the JV1080, these will be in strong demand, call us now! ***Expansion boards only £199.99 each!***

RRP £1399
£899.99

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 VAT. UK mainland carriage from £9.99. Please allow 10 working days for cheque clearance. Errors & omissions excepted.

PRICES GUARANTEED*

YAMAHA STAY IN THE MIX WITH YAMAHA

PROMIX 01 Digital Mixer

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

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

RRP ~~£1999~~ **£999.99**

03D Digital Console

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

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

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

RRP ~~£2999~~ **£2349.99**

02R Digital Console

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

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

RRP ~~£6999~~ **£5699.99**

FAT

MEGADEAL ALERT NEW LOW PRICE!

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! 1U rack with 1 knob per function, all the sound controls of the 303 are duplicated, Cutoff, Resonance, Envelope Mod, Accent, Tune and Decay. Waveform is continuously variable from square wave to sawtooth, and an auto tune button is included to retune the oscillator - no more continual drifting!

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

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

FACTORY DIRECT

RRP ~~£199~~ **£129.99**

MC-303 GROOVEBOX DANCE WORKSTATION

Roland

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 'mild' 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~~ **£469.99**

ALSO AVAILABLE WITH MK149 MIDI KEYBOARD only £559.99

MICROWAVE XT WAVETABLE SYNTHESISER

waldorf

The Microwave XT takes all the features of the incredible Microwave II and adds new software and the user interface you've been waiting for! It's simplicity of use is obvious with knobs everywhere (which all send MIDI controllers) and a 2x40 character back lit LCD. At the rear the Microwave XT 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! Superb new sound set - orange!!!

NEW PRODUCT **£1099.99**

RHYTHMTRAK 234 DRUM MACHINE

Zoom

The 234 RhythmTrak is a brand new product from FX giants Zoom. Whilst drum machines have remained little changed in recent years, the 234 certainly brings some fresh thinking with it, together with a fresh price!

As well as all the usual drum and percussion sounds you would expect to find, the 234 also incorporates some of the best electronic kits we've ever heard, together with a huge range of Latin and other ethnic sounds, and 50 bass programs! Parameters such as level, pitch and hi-hat opening can be edited in real time, whilst pads can be set to trigger whole patterns for the ultimate in instant creativity.

We have been guaranteed a large proportion of the first shipment, call now to reserve yours!

NEW PRODUCT **£199.99**

M-BD1 SOUND MODULE

UNDER HALF PRICE!

Roland

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

Very limited quantities - order now to avoid disappointment.

RRP £469 **£169.99**

DM5 DRUM MODULE

OVER 60% OFF PRICE

ALESIS

The DM5 offers superb performance features and an excellent selection of drum percussion & FX samples putting over 540 all-new studio drum sounds with a 1u rack space, many recorded in true stereo and with unique effects. It's Expanded Dynamic Articulation feature allows sounds to change volume, tone, and pitch according to MIDI velocity. The Random Sample Texture realistically varies the sound of the drum as you play. The DM5 includes an ultra-fast trigger-to-MIDI converter with 12 trigger inputs, 4 audio outputs and a backlit LCD display. The drum sound for you is waiting right here! Another Turnkey megadeal!

RRP £429 **£269.99**

WSA1 POLYPHONIC MODELLING SYNTH

Technics

The WSA1 features 64 note polyphony, multiple modelling systems including string, cylinder, cone flare, plate and membrane, whilst parameters like fc, mute and position allow incredible modelling flexibility. Sound is then fed through a digital resonant filter stage, and amplitude envelope. To top the whole lot off, there are 3 FX busses with 55 different algorithms, and digital EQ. Ease of use and programmability is also unparalleled for a modelling system, the huge backlit display gives graphic representations of all editing parameters, whilst the array of modulation wheels and trackball type devices give unrivalled realtime control, and also offer a simple approach to new sound creation. The keyboard version has a disk drive and sequencer (disk drive on rack plays files sounds and plays standard MIDI files only) which handles 10 songs, 16 tracks and 47,000 notes with full graphic note editing - probably the best workstation on the market. Amongst other features are 32 part multitimbrality (2 sets of MIDI in, out and thru), 4 individual outputs (only £168) and a full GM sound set. A few boxed ex-demo models available with six month warranty at these incredible prices

RRP ~~£1999~~ **£549.99**

WSA1 KEYBOARD VERSION

RRP ~~£2499~~ **£699.99**

DR-660 Dr. RHYTHM DRUM MACHINE

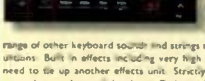
BOSS

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

RRP ~~£459~~ **£299.99**

MICRO PIANO PIANO MODULE

KURZWEIL



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

RRP ~~£599~~ **£349.99**

SOUND MODULES NEW, USED & EX DEMO

ALESIS MONITOR 1 ... £229.99	QUASIMIDI TECHNOX ... £399.99	ROLAND SC50 ... £[illegible]
EMU CARNAVAL ... £499.99	ROLAND MBD1 BASS/ DRUM	ROLAND VG8 ... £1,599.99
EMU MORPHEUS ... £499.99	... £169.99	STUDIO ELECTRONICS ATC1
EMU ULTRAPROTEUS ... £599.99	ROLAND MC50MK2 ... £349.99	... £449.99
HAMMOND XB1 ... £568.99	ROLAND MGS64 ... £199.99	TECHNICS SXWSA1R ... £549.99
MARION PROSYNTH ... £399.99	ROLAND PK5 ... £199.99	

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

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EUROPE'S LOWEST

Wave Synthesiser

TURNKEY EXCLUSIVE! waldorf

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

PRICES FROM £6299.99

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

THE RAVEN

KEYBOARD DANCE WORKSTATION

QUASIMIDI

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

NEW PRODUCT £849.99

X5D

KEYBOARD SYNTHESISER

OVER 40% OFF PRICE 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 onboard 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 £689 £389.99

JP8000

ANALOG MODELLING SYNTH

Roland

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 sounds never before heard. Real-time 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!*

RRP £1499 £1049.99

PROPHECY

VIRTUAL MONOSYNTH

UNDER HALF PRICE! 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 sounds from Moogs through ARP's to some of the classic Rolands. The keyboard that revived the arpeggiator still has one of the best around today, and the ribbon controller and knobs galore make for a highly expressive instrument.

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

RRP £899 £429.99

TRINITY

KEYBOARD WORKSTATION

KORG

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

TRINITY PLUS £1[illegible]
TRINITY PRO £1999.99
TRINITY PROX £2399.99

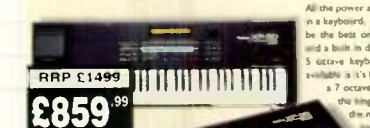
RRP £2345 £1449.99

CALL SOHO SOUNDHOUSE ON 0171 379 6766 FOR DETAILS

XP-50

WORKSTATION KEYBOARD

Roland



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

RRP £1499 £859.99

RRP £1799 £1199.99

XP-80

WORKSTATION KEYBOARD

HP 330e

HAMMER ACTION PIANO

Roland

Taken from the latest updated Roland range, the HP330e is the perfect instrument for beginners and accomplished pianists alike. Encased in a newly-refined cabinet, this hammer-action digital piano features excellent stereo samplings of grand pianos as well as several other fine sounds, including harpsichord, vibes & strings, all with a truly authentic touch.

RRP £1799 £POA

CALL CHARING CROSS KEYBOARDS ON 0171 497 5559 FOR DETAILS

DTR-1

RACK-MOUNT DIGITAL TUNER

KORG

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

RRP £249 £169.99

DTR-2 RACK-MOUNT DIGITAL TUNER

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

RRP £149 £99.99

PC-200 MkII

MIDI CONTROLLER KEYBOARD

Roland

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

Check out our unique package prices with these modules:

SYNTH + PC200 ... £349.99
MIDI + PC200 ... £349.99
MUTE + PC200 ... £349.99
KEYBOARD + PC200 ... £449.99

RRP £199 £139.99

AP10F

88 NOTE WEIGHTED ACTION

CASIO

The Celviano AP10F from Casio is truly unrivalled in its class, combining a high-quality piano sound & fine weighted touch with all the versatility you would expect from a digital piano. With full MIDI compatibility, dual headphone sockets and recording facility, this instrument is perfect for the beginner, whilst accomplished musicians will appreciate the layer, reverb, chorus & tremolo effects available to use with a total of 5 authentic sounds: Piano, Electric Piano, Harpsichord, Pipe Organ & Strings. Featuring an elegant woodgrain finish cabinet, complete with sliding lid, the AP10F is great value for money with quality to match.

RRP £799 £499.99

CALL CHARING CROSS KEYBOARDS ON 0171 497 5559 FOR DETAILS

VOODU VALVE

VALVE DRIVEN DSP PRE-AMP with HUSH

ROCKTRON

The Voodu Valve is Rocktron's flagship valve pre-amp processor giving you over 250 programmable memory patches using it's huge choice of external effects which include 2 tap chorus/flange, dual mode phaser, compression, tremolo, reverb, delay, pitch shift and frequency programmable wah/wah. All patches can access Rocktron's famous Hush Noise Reduction and speaker emulator.

Also available Rocktron Replifex, Rocktron Intelifex & Rocktron Chameleon - call for more details!

RRP £1042 £699.99

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!

RRP £899 £729.99

PSR-330

MIDI KEYBOARD

YAMAHA

This PSR330 is an excellent value Touch-Sensitive General MIDI keyboard, incorporating numerous high-quality Yamaha features. Functions such as 5-track Melody Memory, 100 Nice Accompaniment Styles and 26 Multi Pad Banks, are combined with superb sound quality to make the PSR330 a really great performer!

NEW PRODUCT £299.99

CALL CHARING CROSS KEYBOARDS ON 0171 497 5559 FOR DETAILS

GUITAR SILENCER

COMPRESSOR/LIMITER with HUSH

UNDER HALF PRICE!

As one of the world leaders in the guitar processing field, Rocktron bring you the guitar silencer. This 1u rack combines a 2 channel compressor/limiter with Rocktron's famous 'Hush' noise reduction switchable from the front panel or external MIDI switching device.

As well as the guitar silencer we have managed to obtain a small quantity of the entire Rocktron range at unbelievable prices - call for more details!

RRP £322 £129.99

CALL SOHO SOUNDHOUSE ON 0171 379 6766 FOR DETAILS

CS1x SYNTHESISER

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 128 special performance sounds especially designed for dance and techno music. Front panel knobs allow instant access to crucial editing parameters like the filter, and 2 are assignable to anything you like. Round this off with top quality effects and an arpeggiator, and you have what has to be the best value keyboard of the year!

RRP £599 £499.99

BUY WITH VL70m VIRTUAL LEAD MODULE for only £799.98

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.

RRP £119 £99.99

Check out our unique package prices with these modules:

KEYBOARD + MK149 £319.99
MIDI + MK149 £319.99
MUTE + MK149 £349.99
DEMO + MK149 £389.99

SANSAMP RANGE

TECH 21 • NYC

The Tech 21 range of hand built American products emulates every tube amplifier sound ever desired, giving you the classic Fender, Marshall, Boogie, Hiwatt, Vox colours and all in one versatile unit at a fraction of the cost of the originals.

XXL distortion preamp pedal ... £89.99
TRI-DI 3 ch. preamp ... £149.99
GTR preamp simulator ... £149.99
Classic Sansamp ... £249.99
SansDrive DI ... £99.99
SansAmp PSA1 rackmount ... £299.99
Trademark 60 1x12 ... £399.99

CALL SOHO SOUNDHOUSE ON 0171 379 6766 FOR DETAILS

KX88

MASTER KEYBOARD

YAMAHA

The KX88 has been the luxury master keyboard of choice to top studios, and with the launch of the Synthesizer, has probably the best version available. 88-note wooden weighted keyboard. Inputs for 2 sustain pedals, 2 continuous controller pedals (one of each is included), breath controller, 2 wheels, 4 sliders, 5 momentary switches, 2 toggle switches and after-touch. Apart from taking pride of place in your studio, the KX88 can be considered a collector's item, and with no sounds to go out of date, it will last your whole musical career.

RRP £1649 £799.99

KEYBOARDS NEW, USED & EX DEMO

ALESIS QS6 ... £529.99	NOVATION MM10X ... £99.99	TECHNICS SXPX203M ... £949.99
ALESIS QS7 ... £899.99	PEAVEY PC1600 ... £249.99	TECHNICS SXWSA1 ... £899.99
ALESIS QSR ... £529.99	ROLAND A80EX ... £1199.99	VISCOUNT CLASICO 50 £449.99
EVOLUTION MK161 ... £139.99	ROLAND EP85 ... £569.99	VISCOUNT FK1000 ... £449.99
FATAR STUDIO 1100	ROLAND G600 ... £1149.99	VISCOUNT MF01 DATAFILER
FLIGHTCASE ... £799.99	ROLAND HP 530 ... £1199.99	... £199.99
FATAR STUDIO 2001 ... £799.99	ROLAND HP330 ... £1249.99	VISCOUNT RD800 ... £1199.99
FATAR STUDIO 61 ... £149.99	ROLAND RD500 ... £999.99	YAMAHA CLP411 CLAVINOVA
FATAR STUDIO 610 ... £169.99	ROLAND RD600 ... £1149.99	... £999.99
KORG N364 ... £629.99	ROLAND XP80 ... £1,149.99	YAMAHA CVP69 ... £1699.99
KORG TRINITY HD OPTION £199.99	TECHNICS SXPX201M ... £799.99	YAMAHA P300 ... £1499.99

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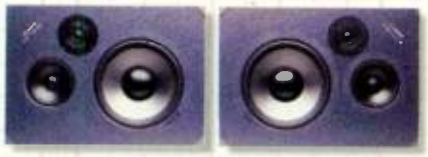

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SAMSON AUDIO

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

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

RRP £289 **£169.99**

C1000 CONDENSOR MIC

AKG

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

RRP £286 **£149.99**

WMS51 WIRELESS MIC SYSTEM

High quality diversity radio mic systems have always been the 'norm' of the professional, due to the high costs often associated with them. AKG's WMS-51 system breaks this tradition, offering an unbelievable price/performance ratio. The system consists of either the HT51 hand-held transmitter featuring AKG's well known and respected d3700 dynamic capsule, or the BT version can accept any of the Micro Mic 5 series of guitar, while reception is handled by the SR51, a half rack receiver featuring balanced and unbalanced outputs, a control for squelch (RF interference rejection) and an auto mute facility.

RRP £316 **£219.99**

AT4033
LARGE DIAPHRAGM MIC

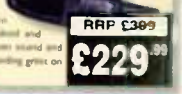
audio-technica

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

This price is available on current stocks only.

RRP £599 **£319.99**

C3000 LARGE DIAPHRAGM MIC



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

RRP £389 **£229.99**

SM58
INDUSTRY STANDARD DYNAMIC MIC

SHURE

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

RRP £169 **£99.99**

NT1
LARGE DIAPHRAGM MIC

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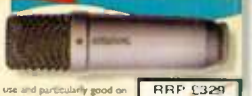
RØDE



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

RRP £329 **£199.99**

NT2 ALSO AVAILABLE only £499.99

CONTROL 5
STUDIO MONITORS

JBL

These classic monitors from JBL have been a standard in studios for several years and still stand up very well against more recent competition. The solid build quality you can expect from JBL comes as standard and the patented design gives fantastic bass response. Internal foam helps to prevent blown tweeters and a compatible Turnkey sub-woofer is also available for only £199.99. Exclusive to Turnkey.

RRP £439 **£249.99**

CONTROL 1 COMPACT MONITORS

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RRP £199 **£99.99**

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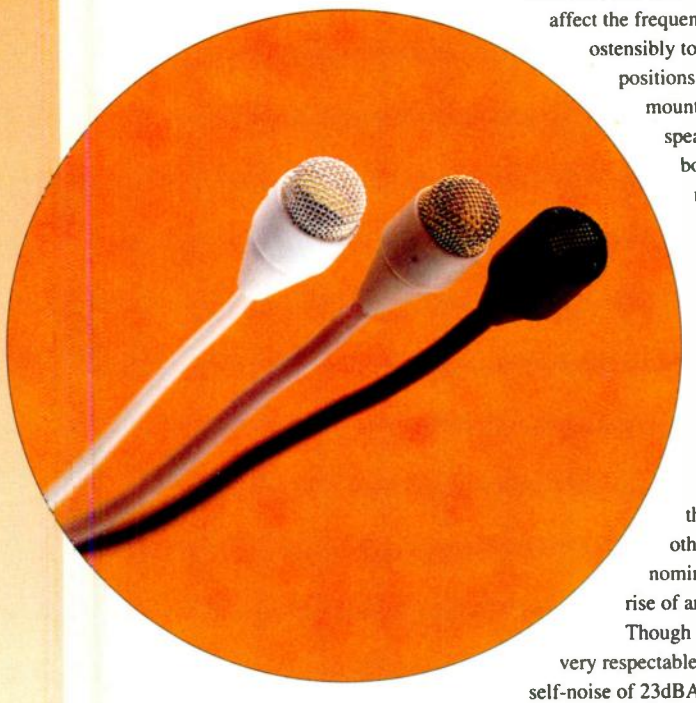
Danish Pro Audio

Miniature Microphone

PAUL WHITE dons his reading glasses and sets out to test a miniature mic with a big sound.

When it comes to studio mics, it often seems that size matters — clients are impressed by big microphones. In certain applications, though, it's small mics that have the big advantages. The Danish Pro Audio microphone under review here is so small that a conventional mic cable would dwarf it, so instead it comes permanently fixed to the end of a miniature cable only a couple of millimetres thick. This



terminates in a miniature MicroDot gold connector that plugs into its seemingly massive phantom power adaptor, which is built inside a conventional XLR plug. It can also plug into most professional radio mic systems.

Miniature microphones are traditionally used for theatre and broadcast work, often in conjunction with radio transmitters, and that seems to be the prime market for these models, but a number of musicians have experimented with using them for recording, with encouraging results. In live recording situations, where minimising spill is a serious concern, miniature mics such as these can be clipped directly to the instrument, rather than being positioned at a distance, with the advantage that if the player moves around, the mic maintains its position relative to the instrument.

THE DPA 4060

The omni (omnidirectional) pattern DPA 4060 is the most sensitive model (20mV/Pa) in a series of three similar mics from Danish Pro Audio, and uses a 5.5mm electret capsule with a vertical diaphragm. Because live work often involves less than ideal conditions for traditional microphones, these models are designed to resist humidity and to minimise wind and pop noise. Obviously, with a mic the size of a lentil there's really no place to put an effective external pop shield!

Two different protection grilles come with each mic, and these may be interchanged to affect the frequency response of the mic, ostensibly to compensate for mounting positions. For example, if the mic is mounted on the chest of a speaker, it will require a 10dB boost at 12kHz to maintain a neutral sound. The longer of the two grilles provides this response. Fitting the other grille provides a nominally flat response, with a rise of around 3dB at 12kHz.

Though tiny, the DPA 4060 has a very respectable noise performance, with self-noise of 23dBA. Levels of up to 120dB can be handled, with the distortion rising to 1% at the limit of its range, providing the user with a dynamic range of 97dB. There's a further 13dB of headroom above this before clipping occurs.

APPLICATIONS

If a mic of this size can really deliver the quality of a full-size microphone, the recording implications are significant, not only for live work, but also in the studio, where several acoustic musicians may want to play together in close proximity. With conventional microphones, phase problems due to the use of multiple mics arise, not to mention the degree of spill that invariably occurs. Even though omni mics don't have the off-axis rejection of cardioid models, if you can get them very close to the sound source the inverse square law makes it possible to get a better ratio of wanted sound to unwanted sound, and should reduce phasing problems into the bargain.

> "...there are places this mic can boldly go that regular mics just can't reach."

Of course, if you get a mic too close to a sound source, you may change the sound, because most musical instruments vibrate in different ways over different parts of their surface. By close miking just one part of the instrument, you risk capturing a sound that isn't representative of the instrument as a whole. Even so, providing you can get close to the sound you're after, the compromises you have to accept when close miking may be less serious than the ramifications of spill and multi-mic phase problems, so purist acoustic laws suggesting that very close miking is inaccurate in most applications shouldn't deter you from trying.

When recording folk music or bands with a predominance of acoustic instruments, it's often the stringed instruments that are the hardest to mic up, not least because they're relatively quiet compared to wind instruments or percussion. With that thought in mind, I set about clipping the mic to my acoustic guitar.

pros & cons

DANISH PRO AUDIO 4060 £270

pros
- A big sound from a very small mic.
- Versatile — it sounds good with just about everything, including vocals.
- The small size means you can get really close without getting in the player's way.

cons
- You might lose it!

summary
Though designed primarily for broadcast and theatre work, this little mic has a number of genuine uses in the studio and for live recording.

SOUND ON SOUND

DPA 4060

Even though many acoustic guitars come with piezo pickup systems, few people seem to like the sound well enough to record in that way.

RESULTS

This mic certainly sounds a lot bigger than it is, and it seems to combine the sensitivity and openness of a capacitor mic with the slightly more punchy mid-range projection of a good dynamic model. Clipped to the soundhole of an acoustic guitar, so that the capsule is about one inch away from the edge of the soundhole, the result is far more signal than you get with conventional miking, yet the tone is warmer and more natural than you usually get with bridge transducers. The sponge padding on the clip also works well in decoupling mechanical noise from the mic, so that the guitar handling noise is really no worse than when you're miking conventionally. However, I would suggest anchoring the cable at some point, as tapping the cable can transmit sound back to the mic. The only thing you have to be careful of is that if the mic capsule is located too close to the soundhole, not only do you get a little additional bass end that you probably don't want, but the tone also changes as the player passes their hand over the soundhole. This sound change is real — the mic's only picking up what is actually there — but with a more distant mic the sound from all over the guitar body will integrate and mask this local effect.

The mic also produces a surprisingly full vocal sound, with little tendency to pop, and for doing quick demo recordings of singer/guitarists, you can get quite acceptable results by clipping the mic to a lapel (or fold of T-shirt, as is more likely to be the case!), then adjusting the balance by moving the mic closer to or further away from the guitar. Because the mic is so small, the off-axis response is particularly good, so it doesn't matter too much which way the mic is pointing.

Most things sound nice through this mic, but (and I know you'd want me to try this!) I also clipped it to the end of a didgeridoo, where it produced loads of output, with plenty of brightness and detail. This would be a great (if not entirely accurate) way to mike the instrument live, but even in the studio I can see a combination of the DPA 4060 close up, and a conventional mic further away, working quite well. I've also heard reports of the mic producing good results on violin, and after my experiences with the acoustic guitar I can well believe it.

VERDICT

Paying around £250 for what looks like a black lentil stuck to the end of a thin strand of liquorice might go against your instincts, but there are places this mic can boldly go that regular mics just can't reach. If you have separation problems when recording acoustic instrument ensembles, but you can't afford to compromise on sound quality, the DPA 4060 is one mic that just might save the day. SOS

info

£ £270.25 including VAT. Black, white and pink/beige versions available.
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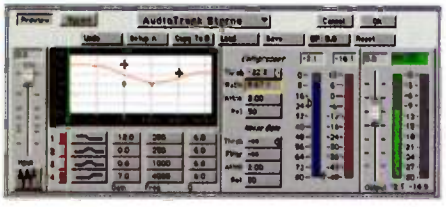
Audio Track

Mac interface



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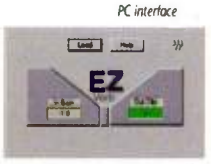

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KRK RoKit

Nearfield Monitors

Have KRK managed to preserve their family sound at this new low price point? PAUL WHITE gets ready to Rok...

KRK's monitors are no strangers to the pages of *SOS*, but this is the first time the company have built a nearfield monitor priced to appeal to the broad spectrum of home studio owners.

ROKIT TO ME

The majority of KRK monitors feature straw-coloured, woven Kevlar speaker cones and a distinctive inverse-dome tweeter, but on the RoKit these have been replaced by more conventionally equipped drivers. The tweeter, which is recessed to be flush with the front baffle, is around one inch in diameter and is fitted with a fairly stiff, doped, silk fabric dome, whereas the six-inch bass/mid-range unit utilises a polyvinyl cone set in a compliant roll surround. Unusually, the centre

dust-cap is concave, and a contoured ring is fitted around the outer edge of the driver to provide a smooth transition to the baffle. Six cross-head screws hold the driver in place.

Even though the RoKits cost significantly less than other KRK models, the immediately recognisable tapered 'Stargate' shape has been retained, as has the grey textured-paint finish and the generously radiused corners. Radiused edges help reduce cabinet-edge diffraction, while the trapezoid cabinet shape reduces the severity of standing waves inside the cabinet by eliminating one pair of parallel surfaces. Considering their small size, the MDF cabinet construction is surprisingly sturdy and rigid, with a flawless finish, but the weight is still fairly low, at only 29lbs per pair. The bass ports are visible as two triangular openings at the base of the baffle, and these extend back into the case to provide the cabinet's reflex tuning at low frequencies. The port openings are also radiused.

With a nominal impedance of 8Ω, the RoKits are rated at a nominal 75W each, and with an efficiency of 91dB for 1W at 1 metre, they can produce SPLs of up to 104dB. Magnetic driver shielding is fitted as standard, enabling the speakers to be used near TV and computer monitors without compromising picture quality. The passive crossover operates at 1.5kHz, and connection to the speakers is via a pair of red and black brass-cored terminals designed to accept spade connectors, bare wires or banana plugs; no provision is made for bi-wiring. The overall cabinet size is a modest 12.5 x 10.5 x 8 inches, and they can be used directly behind a console without having a significant effect on the engineer's sightline. A further advantage of the tapered shape is that users are less likely to try to use these monitors on their sides — a practice that invariably compromises a speaker's dispersion in the horizontal plane, resulting in a very narrow sweet spot.

LISTENING TEST

As usual, I employed my standard small monitor test setup, comprising a Marantz CD52 bitstream CD player and an AVI integrated amplifier capable of delivering around 60W per channel. Initial impressions confirmed that the RoKits follow the KRK family tradition of producing a sound just slightly on the bright side of neutral, but not excessively so. The supplied frequency response graph shows that the RoKits have a response from just below 70Hz to well in excess of 20kHz, +/-2dB, and there's a very gentle high-end rise centred around 10kHz or so, which probably accounts for the impression of brightness. The sound is certainly very open and detailed, making it easy to home in on the individual elements of a mix, and the bass end, although not as extended as on some larger monitors, goes deep enough to do justice to most material without causing problems in acoustically untreated rooms. Kick drums remain punchy, with a nice smack, but organ pedal notes or the lower octaves of TR909 kicks are likely to slip under the net. The stereo imaging is good, and it's possible to move quite a way off-axis without compromising the sound, which is always a good sign.

Studio monitors have to sound good at both high and low listening levels, and though the bass seems quite light at very low levels, this requirement is largely fulfilled. At mid to high listening levels, the bass firms up and the sound stays clean and open until you crank up the level to a point where it starts to get uncomfortable for nearfield work. At this point the top end becomes a little raggy and aggressive, but that's to be expected. At all sensible monitoring levels, the sound stays clean, well-defined, and only slightly brighter than from the ATCs that I use as my standard reference. Admittedly the sound isn't quite so smooth and well integrated as from my reference monitors, but then the RoKits cost less than the VAT on my ATC SCM20s!

CONCLUSION

When I first heard the RoKits, I had no idea what they cost, and having had experience of other speakers in the KRK range, I assumed that they would cost upwards of £350. As it turns out, my guess was over by around £100, which makes the RoKits a very attractive proposition for the smaller studio looking for a revealing set of nearfield monitors.

The RoKits are better engineered than many competing speakers in this price range, though obviously the drivers are less expensive than those used in KRK's more up-market models. Even so, the designers have still managed to retain the family sound. The detailed and revealing character of the RoKits makes them ideal for monitoring in smaller studios, where the room acoustic might produce misleading results from larger monitors. The lack of bass extension might be perceived as a problem by those mixing dance music, but realistically the accurate monitoring of deep bass requires a large, acoustically treated control room. SOS

pros & cons

KRK ROKITS £269

pros

- Great styling, with open, revealing sound.
- Cost effective.
- Magnetically shielded drivers for use near TV and computer monitors.

cons

- Voiced slightly on the bright side of neutral.
- Limited bass extension if used as the only monitor in a studio.

summary

A sensibly priced nearfield monitor that delivers a good standard of performance in a compact package.

SOUND ON SOUND

info

£ £269 per pair including VAT.
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CREATIVE

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ElectroVoice RE500

Capacitor Microphone

PAUL WHITE studio tests EV's new capacitor model, designed for use both on stage and in the studio.

Electrovoice mics find their way into recording studios, live sound venues and broadcast studios around the world, but the company are hoping that the new RE500 will satisfy the requirements of all three. Though it looks like a dynamic mic, the RE500 is a true capacitor design, with a fixed cardioid polar pattern. It's designed for both hand-held and stand-mounted operation, and for the benefit of the live vocalist it has a rather unusual rubber coating, to help improve both grip and comfort. Live mics need all the help they can get to minimise popping, as there's no room for an external pop shield when you're on stage, so the RE500 includes a built-in three-stage wind and pop shield, augmented by an 80Hz low-cut filter. The outer wire basket has a foam inner lining, and about halfway down the basket is a metal ring with what looks like a fine nylon mesh stretched across it. The mic comes complete with a stand clip and zip-up vinyl case.

For the project studio owner, the RE500 offers a wide dynamic range, sensibly low noise, and a subtle presence characteristic to help add sparkle and projection to vocals. Because it has a far better transient response than a typical dynamic mic, the RE500 is also suitable for recording acoustic instruments and percussion. Its frequency response is quoted as extending from 80Hz to 18kHz, with a sensitivity of 10mV/Pa. Equivalent noise is quoted as 20dB SPL, A-weighted, and the circuitry doesn't clip until the level exceeds 148dB SPL. This gives a usable dynamic range of 128dB.

The design of the mic is based on the existing RE2000 transducer and utilises a gold-sputtered diaphragm that has been environmentally stabilised to minimise ageing effects. All capacitor mics have a moving diaphragm and a fixed electrode, and in the case of the RE500 the latter is a precision-cut ceramic plate with a gold coating. Unusually, the biasing voltage is derived from an internal DC-to-DC converter, the idea being to isolate the capsule voltage from possible variations in phantom power voltage. This system allows power supplies between 12 and 52V DC to be used without compromising the performance of the mic. The RE500 has no on/off, filter or pad switches — you plug and play, literally.

TESTING TIMES

It's difficult to evaluate microphones in isolation, so my usual review procedure is to compare new mics with models that I'm familiar with. I have to say that the RE500 stands up very well against most large-diaphragm capacitor models when it comes to achieving a full, natural sound. In terms of sensitivity, the RE500 comes just a few dB below my Rode NT1, but when the levels are balanced the tonality is surprisingly similar on vocals, with perhaps just slightly less presence from the RE500. I particularly like the even, natural response of this microphone, and when it's used reasonably close up, the proximity effect lends it a pleasing, intimate warmth.

On a more practical level, the capsule shock-mount system works extremely well in rejecting low-frequency noise, though inevitably you get a bit of mid-range noise if you rub your hands over the microphone body. The rubber-coated body provides a comfortable grip, and the physical shape and size of the mic make it ideal for hand-held use, though in the studio you'd be more likely to use it stand-mounted.

Of course, a mic like this is more than just a vocal mic, and despite its slightly lower sensitivity when compared with most of my studio capacitor mics, it's still sensitive and quiet enough to use on acoustic instruments, where its gentle top-lift lends it a natural, articulate quality. This would be a good mic to use on acoustic guitar, but it could also be pressed into service for most jobs, including drum overheads, hi-hat miking, wind instruments and percussion. The LF roll-off would make it less suitable for miking bass instruments (unless it's used close up), as the purpose of this roll-off is to help counteract the proximity effect that might otherwise make the response too bass heavy in close-miking situations.

VERDICT

This is a very nice-sounding microphone that combines warmth and punch with a mild high-end lift. Though the capsule size might best be described as medium, it has something of a large-diameter capsule sound about it, and is quite flattering to vocals, without making them sound unnatural. The physical packaging of the microphone is both attractive and practical, and the handling noise is reasonably low, especially at low frequencies. This would be a good choice of microphone for someone who wants to be able to use the same mic live and in the studio, but there's also no reason not to use it as a dedicated studio mic. EV have done their best to provide a mic that's a good all-rounder, and from what I've seen, they've succeeded. SOS

pros & cons

ELECTROVOICE RE500 £296

pros
- Warm, smooth sound.
- Gentle presence lift.
- Low handling noise.

cons
- Fixed LF cut means miking bass instruments at a distance may result in a slightly bass-light sound.

summary
A good all-round mic that sounds smooth and natural on vocals.

SOUND ON SOUND

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acid test

PAUL WHITE takes two migraine tablets and has a nice sit down before tackling the 'eye-catching' Resinator filter unit...

FAT RESINATOR FILTER

The Resinator is the latest in the line of FAT processors with drug-related innuendo woven into their product names. It's a rather quirky, filter-based unit that can be used to add interest to synths and other sources that don't already have resonant filters built in, and despite its rather flimsy engineering, knobs that slide off at the slightest provocation, and a front panel that doesn't so much look silk-screened as sneezed, it's capable of producing some cool sounds.

PUREST GREEN

Powered from an external PSU that looks rather more substantial than the aluminium rack unit it plugs into, the Resinator is an all-analogue processor based around not just one but three sweepable, Vactrol-controlled band-pass filters. There's no MIDI trigger facility, which is rather limiting in some ways, but the filter sweep may be controlled either from the input signal's own envelope, by an internal LFO, or from an external source. It's also possible to sweep all three filters from a single front-panel control, which is useful for adding those impromptu sweeps mid-performance.

Everything about the Resinator, including the front panel of 'purest green', is weird. For a start, the filters all have a fixed, fairly high resonance, and the front-panel Resonance control really just balances the dry sound with the filtered sound. Each filter may be set to a different frequency and the unit has a degree of stereo capability, achieved by routing filter 1 and filter 3 to a pan control and keeping filter 2 centre-stage. The input is mono. The other notable bit of visionary weirdness is the way the envelope follower actually comprises three independent, frequency-selective followers, each of which controls the frequency of a different filter. The low part of the envelope follower controls filter 1, the mid part controls filter 2 and the higher harmonics control filter 3, so the filters will interact in different ways depending on the spectral composition of the incoming sound and the setting of the filter frequencies. This characteristic, combined with the stereo output, is probably the most interesting and creative aspect of the Resinator. Unfortunately, the attack time of the envelope follower is fixed — you can only adjust its decay time.

The filter frequencies may also be controlled by an onboard LFO, but even this isn't straightforward. The LFO actually comprises two oscillators running at slightly different speeds, and LFO 1's output can be inverted, making it possible to create three different sources in total. Both LFOs claim to generate a sawtooth waveform rather than the more obvious sine or triangle wave, but the result sounds more like an asymmetrical triangle wave to my ears.

Not content with having three possible permutations of modulation source, the Resinator routes these to the filters in different ways, so that, with the exception of LFO Mode 1, not all the filters are swept from the same source. Indeed, in Mode 3 each of the three sources is fed to a different filter, and as LFO 1 and 2 run at different speeds, this can make for some unusual stereo panning effects. Mode 2 routes LFO 1 to filters 1 and 3, with LFO 2 driving filter 2.

CONTROL FREAKING

If I've engaged your curiosity, read on for a quick sprint through the front-panel controls. As you might be able to tell from the accompanying picture, the legending is very difficult to read because of the shiny aluminium and the virulent green patches around the knobs— it's as though somebody has loaded a handful of caterpillars into an air rifle and let rip at the front panel!

Going from left to right on the front panel, the Pan control shows up first. This changes the stereo pan position of band-pass filters 1 and 3 relative to filter 2, which is always panned centre, as I mentioned above. The Resonance knob is simply a dry/effect balance control, and has no effect at all on the filter resonance, which is fixed. The Volume control sets the output level of the effected sound, and a Bypass switch allows you to return to normality once in a while.

Each of the three filters has its own frequency control, and though no calibrations are provided you can get everything from a bass 'whumph' to

pros & cons

FAT RESINATOR £199

pros
- Complex-sounding stereo filter effects from any mono source.
- Inexpensive.
- Full controllability via knobs.
- Rich filter sound.

cons
- Looks like an Australian shirt-designer's nightmare.
- Perfunctory, lightweight engineering, with ill-fitting knobs.
- Limited range of effects available.
- No MIDI trigger facility.

summary

I've seldom had so much fun with a product that has so many negative points. If you like to mix adventure, music and eyestrain, try it out.

SOUND ON SOUND

a thin 'zweee', with a range of 'fhwizooophs' in between. The LFO section has just two knobs, for depth and rate, and a three-position slide switch for the different modes, as described earlier. The LFO rate is variable, from extremely slow to around 2Hz, but I'd have liked a range switch to get much faster sweeps as well. The Envelope Modulation section also functions with just two controls (Depth and Decay), while a polarity slide switch allows the envelope to push the filter frequency either up or down.

Finally, there's a single control for Man/Ext Modulation, and if nothing is plugged into the rear-panel modulation jack this knob provides a manual means of sweeping all three filters together. With an external source connected, the control can be turned left of centre to enable the modulating source to push the filter frequency down, right of centre to push the filter frequency up, or centred for no effect. Positions between these extremes provide proportional amounts of modulation. This external input seems to track the envelope of the external signal rather than feeding the signal direct into the filter modulation circuit, so while it's quite predictable in operation, it precludes those nice quasi-ring-modulator effects that can be achieved by modulating a filter with raw audio.

FAT SOUNDS?

Considering the large number of controls on the Resinator, it seems capable of producing only a fairly limited range of effects, and because of the rather unorthodox system of having three different filters, each often doing its own thing, the results aren't always predictable. However, some of the treatments that can be coaxed from this little box are both interesting and unusual in a musically useful way; especially nice is the way the filters create a dynamic stereo image from a mono source. Adding movement to pad sounds is easy, as is adding a fairly normal envelope sweep to a percussive synth sound, but the lack of MIDI Note On control means that the triggering varies depending on whether notes overlap or not, and the lack of an envelope attack control limits the kind of sweep effects you can create.

Another limitation is the fact that the filters have a fixed resonance, so all the sweeps are quite rich, and because the filters are band-pass rather than low-pass, you can find the low end disappearing on certain settings. Despite all these idiosyncrasies, the Resinator is great fun to play around with, and it is possible to come up with some unexpected effects that are not readily available from any other source — other than, perhaps, a complicated modular analogue synth system. What's more, it doesn't seem to add much in the way of noise. My old Kawai K1 sounded much more dynamic and involving after being Resinated.

SUMMARY

It's flimsy, the knobs slide off, it looks awful, the controls don't make a great deal of sense and you can't read the knob legending — but in spite of all these things I find myself quite liking the Resinator. Very often, the most interesting sounds come from imperfect equipment or equipment that imposes certain limitations on the user, and this is definitely one such box. If it had been perfect, it would probably also have been predictable; as it stands, the Resinator provides an admittedly narrow range of unique treatments that can make the most jaded old synth sound modern and interesting. Anyone into techno or other experimental musical forms would probably find the Resinator quite useful, and because it can be controlled directly from front-panel knobs it is also suited to live performance, or recording where some form of live interaction is required.

This isn't a box to buy if you want to sound like something you've heard on record (unless they were also using one of these things), but if you want to break a few barriers and turn boring mono sounds into coruscating stereo festivals of sweeps and glittering harmonics, the Resinator might just be the ideal way to spend a couple of hundred quid. SOS

"You can get everything from a bass 'whumph' to a thin 'zweee', with a range of 'fhwizooophs' in between."

Given the OTT nature of the front panel, the Resinator's rear is uncharacteristically spartan!

Info

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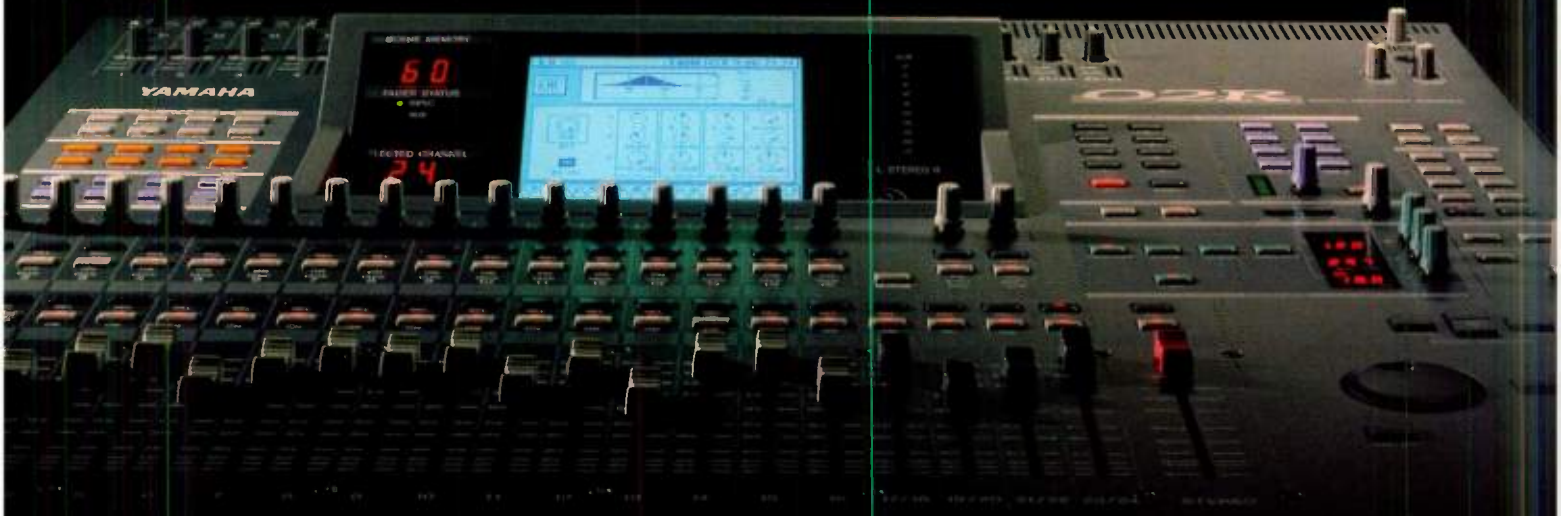
KARL BARTOS • ELECTRIC MUSIC

This month sees the release of the new album from Karl Bartos, former member of electronic trailblazers Kraftwerk. But the synth sound is no more — Bartos' new record is closer to Beatle-esque Britpop. JONATHAN MILLER investigates, and looks back to the days when the Klang was King...

It's a commonplace scenario: disillusioned musician leaves established group due to "musical differences." Said musician briefly basks in the shadow of former musical glories, but rapidly disappears into obscurity. There are, of course, occasional exceptions to this unwritten rule — enter Berchtesgarten-born 45-year-old multi-instrumentalist Karl Bartos, former member of reclusive electronic pioneers Kraftwerk.

"Meine Damen und Herren, Ladies and Gentlemen, heute abend aus Deutschland, die Mensch Maschine — KRRRAFT-WERRRK!". It's now been eight years since Karl last heard this 'Robo-Voice'-driven concert rallying call during five low-key live dates in Italy at the turn of this decade, which constituted his last public duties with Kraftwerk. Despite co-Kraftwerk founder ▶

02R V2



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▶ Ralf Hütter's oft-quoted insistence that the objective of the group is one of "working without respite toward the construction of the perfect pop song for the tribes of the global village", the reality — that Kraftwerk had only produced two albums of new material since the early 1980s — was obviously too much for Karl Bartos to bear (1991's *The Mix* doesn't count, as it featured re-recorded versions of older songs). Tired of forever awaiting this "perfect" pop song's arrival, Bartos departed what he termed "the best German group ever" in August 1990, and immediately formed Elektric Music (as it was then spelt), initially in collaboration with Lothar Manteuffel from fellow German group Rheingold. Apparently the new recording project was originally going to be called Das Klang Institut [*The Institute Of Sound — Middle European Ed*], but this was passed over because it sounded too similar to the name of Kraftwerk's Düsseldorf-based recording studio, Kling-Klang, where Karl had spent so many late nights during the previous 15 years.

MUSIQUE NON-STOP

Although now happily residing in Hamburg, it's apt that I met Karl on his Düsseldorf 'home turf' (ironically within walking distance of Kling-Klang) at Skyline Studios, where he was applying the finishing touches to the second Electric Music album, titled simply *Electric Music*. Given Karl's dissatisfaction with Kraftwerk's inactivity, it's somewhat ironic that *Esperanto*, Electric Music's debut platter, did not emerge until 1993, three years after the split from Kraftwerk — and it's taken *five* years — a distinctly Kraftwerkian, though not intentional, concept — for *Electric Music* to arrive.

But, as Karl amiably reasons, "When I left Kraftwerk, I had to build my *own* studio. Finally, I found a suitable place, and had to decorate it and make various acoustic treatments which took me almost a year. Then I started composing tracks with my ex-partner Lothar Manteuffel, who had been a friend of mine from the very early days. ▶

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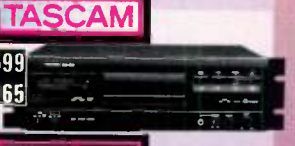

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▶ When he was in school [*Kraftwerk collaborator*] Emil Schult was his art teacher, so he was always around. Forming a band with him was an obvious move after Kraftwerk. I did my first record in 1993, and he helped me a lot with that; now I'm doing the second one on my own."

THE SOUND OF SILENCE

Given the air of secrecy that enshrouds Kraftwerk and Kling-Klang, and which has shielded the studio and its occupants from the outside world for so many years, I could not resist asking Karl if he had sneaked any equipment out from the cloistered confines of Kling-Klang when he left the group.

"Sure. I'm collecting equipment all the time. The most famous thing I brought with me is probably the electronic voice: the so-called 'Robo-Voice' from 'The Robots', 'Musique Non-Stop' and other Kraftwerk tracks. I'm not using it so much now; I've got a little sick of it!".

The second, eponymous, Electric Music album.

'Crosstalk' (Electric Music's first single release, from 1992) extensively features this long-standing Kraftwerk staple. The album track and single 'TV' also sounded very like Kraftwerk: the string sounds are remarkably similar to those heard thoughout Kraftwerk's 1976 groundbreaking effort, *Radio-Activity*, and moreover, the sampled voices from around the world and even the album title hint at Ralf Hütter's aforementioned objective of writing the perfect global pop song.

Karl confirmed that this was the intention, agreeing, "I had a lot of ideas when I was in Kraftwerk, and making a song about television was just a continuation of the same idea we had when making a song about radioactivity; that we're now living in an information society. We went through that idea when we made the *Radio-Activity* album in the '70s and I thought, 'Well, nowadays it's just television, isn't it?' The lyrics were just headlines, basically; it was written with a very journalistic approach. I had this image of an information society, so I wrote a song like you'd write an article in *The Times*. Actually, from my viewpoint, this idea of Esperanto being the global language, and mixing elements of other languages to form a new one is what music has always been about. Music is a global language; it's understandable without words."

To all intents and purposes, the *Esperanto* album cover design (by long-term Kraftwerk collaborator Emil Schult, who also assisted lyrically) is essentially the old Japanese flag. I had assumed that it signified a connection between the ever-increasing possibilities for global communication and the influence of Japanese technology. This proved at least partly correct: "Well, you're right," says Karl, " it is an old Japanese flag, and they put it on their warships, but it's even older than that; it just represents the sun. Esperanto means hope, and the best symbol for hope is the sun, because it keeps us alive."

ELEKTRIC BECOMES ELECTRIC

Karl attributes the delay in producing *Esperanto*'s follow-up to a number of factors: "After *Esperanto*, two Mancunian guys — Bernard [*Sumner, of New Order fame*] and Johnny [*Marr, formerly of The Smiths*] — came into my life, wanting me to play some percussion tracks on their second Electronic record. I went with them to Manchester and it turned out to be a two-year project in the end! I've now written nine tracks with them, and it changed my life, in a way. Then I worked with Andy McCluskey of OMD, and we collaborated on his latest tracks. I got married and moved to Hamburg; these things take a little time!".

Of course, the phrase 'it changed my life' has become a bit of a cliché in the pop world; but in Karl Bartos' case, it would appear that the Mancunian influence truly brought about a sea change in the way he made music. It's not just the spelling of the group name that has changed; in every way, the *Electric Music* album bears little resemblence to its predecessor *Esperanto*, or indeed Kraftwerk (although the opening cut, 'The Young Urban Professional', does actually date back to Kraftwerk days, having been written in 1986 in New York, when the group were recording *Electric Café* there). In fact, the content of Karl's new album is much closer to BritPop. Karl explains the reason for the stylistic shift: ▶

LIVE ELECTRICS

It would be fair to say that Electric Music's new material is pretty densely arranged; there's a lot going on in the mix at any one time. Whilst technology enables Karl to recreate this in the comfort of the studio with relative ease, performing in a live situation may prove difficult. Karl's solution? A live band, of course!

"If I have the chance to play live — and there are already some offers to play some big festivals in Sweden next year — then I'll have a live band. I just don't care about computers anymore. They're not reliable. Also I like to be surrounded by people. It's so nice to have a couple of people around you and just have fun. That was one of the big adventures when we started off with Kraftwerk. We were four guys travelling around, having a good time, all the time! In fact, the most satisfying Kraftwerk period for me was the world tour in '81.

"Nowadays, every big so-called synthesizer group, like Depeche Mode, use 32-track digital machines to play back studio recordings on stage. I mean, it's cool; they can play and they are really good, but I think that way of performing is too much fuss. You need a lot of people for maintenance and two 32-track machines in case one breaks down! Now it's getting cheaper, with all this new digital stuff, but I don't want to do it. I just want a couple of keyboards, guitars and live singing."

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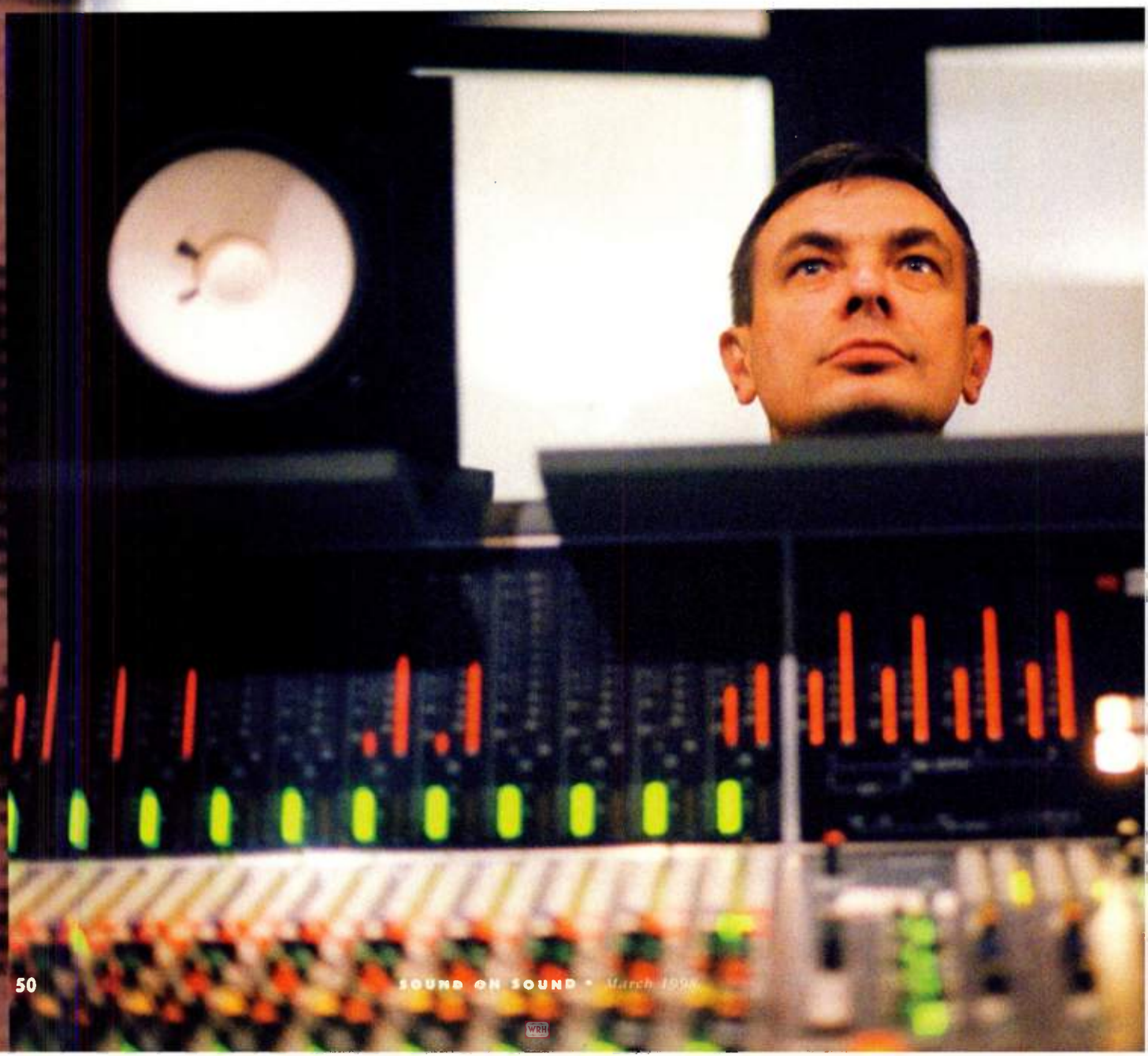
"I think Kraftwerk isn't really techno music in the way that the term is now used."

"When I worked with Johnny Marr in Manchester, he reminded me that I grew up with guitar playing. It reminded me that I can actually play the guitar, and watching him and how he plays was a big influence on me, because I think he's one of the coolest players around. We became friends, and I decided I should make a guitar record — not just a guitar record by putting some guys together, playing guitars, but a guitar record made using my skills with the computer, with technology, sampling, and sequencing. I wanted to make a real hybrid record. Also, it's got more songs than the last one; I'm not just going for so-called techno sounds and structures, but real three-minute pop songs with nice ideas in them."

SWINGING '60S

Although it is of course a late '90s recording, with all the technological trappings this entails, lyrically and stylistically *Electric Music* features some blatant, though admittedly tongue-in-cheek, '60s references. For example, the line 'He blew his mind out on a bed' (from 'Shallow Grave', Karl's homage to Danny Boyle's film) bears more than a passing resemblance to John Lennon's 'He blew his mind out in a car' (from The Beatles' 1967 epic, 'A Day In The Life'). And as Karl explains, the lyric to 'The Young Urban Professional' is a little bit like The Beatles' 'Penny Lane': "'In Penny Lane there is a barber taking photographs...' is similar to 'We can see the young professional walking down the avenue...' It's like a snapshot of five minutes in the life of a young urban professional."

Again, these knowing nods to the past are entirely deliberate. Karl: "I grew up on that British and American pop sound — Motown, The Beatles, Rolling Stones, and The Who. I forgot about them in the '70s when I went back to avant-garde classical composers like Stockhausen, Pierre Boulez and all that *musique concrète* stuff. In Kraftwerk, I really forgot about pop music — although of course we did do songs like 'The Model' which were in that kind of tradition. Nobody recognised it at the time, but it was still a three-minute pop song.



"When I met Bernard and Johnny, it really brought me really back to that kind of writing. Before that, for the whole of the '70s until the mid-'80s, I was only writing on the keyboard; *after* I'd found a sound. Whereas, now I just sit down with a guitar and play in my garden, and sing. For some reason, this gives me the chance to reach people's hearts musically, whereas with Kraftwerk, we reached them intellectually."

GUITAR BITS AND BYTES

As Karl intimated earlier, although he is primarily known as an electronic artist by virtue of his Kraftwerk connection, it should come as no surprise to learn that instrumentation-wise, the new album "is mainly guitars."

Lest fans of Karl's earlier work throw their hands up in horror at the idea of a true electronic pioneer prematurely hanging up his MIDI cables, an illustration of his new-found working methods should prove reassuring: "There are live guitars, but also a lot of sampled guitars, which I put into the computer step by step. I play a chord and sample it, then play a lot of chords and put them in a row. Or I play in individual notes — C, E, G — in a guitar tuning. A lot of it is played originally, but then cut in pieces later. You get nice results if you have a human feel, and you add some machinery to it. It's like a patchwork or collage. The music is played, sampled, *and* computerised — the drums, the bass, and the keyboards are all programmed. I mean, in the end, it's all digital anyway. Whether you record a symphony orchestra or just a guitar 'unplugged', if you have it on a CD, it's all bits and bytes, so what can you do?"

Many slower tracks on *Electric Music* begin with an apparently simple strummed acoustic guitar; although, in keeping with the album as a whole, these parts are often more complicated and densely arranged than might first appear: "The recording technique is very well-known, but nobody does it because it's really time-consuming. It's actually three types of guitars, and I layer them. You put a chord into a MIDI sequencer in the way a guitar player would voice it, not like a keyboard player. So for a C Major chord, the top string would be E, the next C, the next one G, and so on. If you follow that path, you have a guitar voicing.

"The next thing I do is sample the guitar C chord twice; the down stroke and up stroke. Then I sequence the whole song using that technique — *and* play along to that, live. I end up with this very strange feel that nobody can work out — is it artificial, or is it real? To me, it's like the dinosaurs in *Jurassic Park*. They look so damn real, you're frightened when you see them, but you know they're artificial. I'm really after that hybrid style."

IT'S MORE FUN TO COMPUTE

Although the initial stage of Bartos' recordings now seems to primarily involve samplers rather than synths, traditional keyboards have not been entirely forsaken; Karl reveals his fondness for the sound of the Mellotron (though he actually uses samples of the original instruments, which he recorded himself), Wurlitzer pianos, Hammond organs and Theremins, amongst others.

"I always come back to my Minimoog and ARP Odyssey. I've still got them and they're collecting dust, but they're still working. Their sound is still not dated if you know how to twist them a little. The Minimoog is a nice instrument that looks good; a little like a Rickenbacker guitar.

"I've got lots of Akai samplers, but they're just like blank sheets of paper which you can fill with any sound you like. I'm also using Akai DR16 digital recorders and *Logic Audio* software, but I didn't use that on the new album; I programmed everything on my little Yamaha C1 music computer, which is still working. It's dated and slow, but I don't care because it's very reliable and the result is fantastic. It has eight MIDI outputs and built-in SMPTE, but they didn't continue with it, unfortunately. It was the predecessor of all this *Logic Audio* and *Cubase* stuff, because now they've all copied this concept of having a score and a time window."

ARE YOU SEQUENCED?

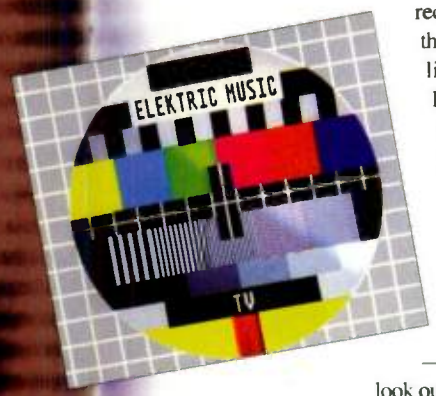
For a group who had supposedly used computers in their music composition from the beginning, Kraftwerk were actually relatively late in stepping into MIDI and computer-based sequencing, as Karl reveals:

"I bought two of the first Linn MIDI sequencers for Kraftwerk in the mid-'80s; the small rackmount units. They were terrible, though; unreliable and very expensive. Immediately after that came the Commodore 64 computers, which were also bad. It started to get easier with the Atari ST, specifically Steinberg's *Pro24* software. When we went to New York and made *Electric Café*, I met [*renowned remixer and producer*] François Kervorkian, and he had an IBM-based computer running a Voyetra sequencer program. I'm still using that today on my Yamaha C1 music computer."

TECHNO? NO THANKS...

Kraftwerk are often namechecked as the originators of what we now know as electronic dance music, or techno. Does Karl actively feel part of the so-called dance movement and regularly listen to other dance-oriented artists?

"No, not really. Although we made a track called 'Technopop' when we came back from Japan, I think Kraftwerk isn't really techno music in the way that the term is now used. I don't really see any connection to all that four-on-the-floor stuff; I mean, it's programmed dance music also, but I consider Kraftwerk to be very different. I never listen to techno, anyway."



Sadly, the use of tried and tested technology like the Yamaha C1 did nothing to alleviate some truly tedious MIDI and audio synchronisation problems. Karl ruefully comments: "It was a nightmare. You know, there are all these interfaces and synchronisers, but if you upgrade to the next generation you can forget everything you've done before, because the offset is so different. We got locked in that trap when playing stuff back from tape using a different interface after the original broke down and got sent away for repair. We had to re-adjust the offset on every track if we wanted to add more parts. This was really time-consuming, and I'll never do it again! The problem should be solved by a technology that's been around for a year or so now called word clock, which seems to be great. If you have long digital samples, like a vocal track, within *Logic Audio*, it will lock up tight as a straitjacket."

HAMBURG IS WHERE THE HEART IS

Both *Esperanto* and *Electric Music* were recorded in commercial studios, Heartbeat in the case of the former and Skyline (whose client list includes such luminaries as ELO, Die Krupps, Propaganda and Karl's fellow ex-Kraftwerk member Wolfgang Flur, with his new YAMO project) for the latter. However, pre-production for the new album took place elsewhere: in Frankfurt, where Karl went to "a friend's studio to record really loud, screaming guitars and feedback", and at his Hamburg home: "All the vocal tracks were recorded at my place — in my library, actually. It was really nice to look out of a window, with no studio atmosphere. I'm now building a really good 48-track digital studio at home where I can achieve almost anything."

Karl's new 'home' studio is simply based around a small Mackie console, his samplers, a pair of speakers, plenty of different guitar amps, and, of course, his DR16s. "The main thing I need is a digital machine where I can store all the recorded tracks; for this reason the Akai DR16 is incredible. It's hard-disk based and reliable; a cheap, high-quality workhorse. It's small, so you can easily take it and record in other places. You can also easily expand it by another 16 tracks by buying another machine. For me, 48 tracks makes a lot of sense at the moment."

With noble sentiments like, "I'm just a musician, not a technician. I couldn't say how an engine works in a car, but I can drive one," Karl is evidently not one for blowing his own trumpet technically. Yet with over 20 years of professional recording under his belt, he's perfectly capable of navigating the modern recording studio with ease...

"We recorded a lot of ambience in the live room. For example, we sent the whole electronic drum kit through there and recorded the ambience with different microphones, which adds a subtle texture. We also sent the sound of a sampled piano into a real grand piano, pressed down its sustain pedal and recorded the resultant overtones. It sounds much more real that way. So there was a lot of re-recording involved in the new album, but it was worth it."

MUSIC FOR BOYS (& GIRLS, TOO)

With many younger musicians increasingly ignoring the creative possibilities of the miking techniques employed by Karl, some might argue that a great deal of yesteryear's engineering skill is now irrelevant — after all, if you want weird sounds, you can always reach for a sample CD. Perhaps the prevalence of this outlook explains Karl's slightly scathing attitude towards the distinctive sounds which assisted in Kraftwerk's rise to fame — and his belief that the sounds he's now using have a more universal appeal. "You know, what's got me a little bit down with so-called

I, ROBOT — KARL BARTOS ON HIS KRAFTWERK DAYS

When he was invited to join Kraftwerk (initially just as a percussionist for a forthcoming tour), Karl was a 22-year-old music student at the Robert Schumann Conservatorium in Düsseldorf, hoping to obtain a regular job as a percussionist with the Berlin Symphony Orchestra. At the time — Spring 1975 — Kraftwerk had unexpectedly made it onto the charts, courtesy of a four-minute single edit of 'Autobahn', their paean to the joys of motorway travel, which, in its original 22-minute version, occupied the entire first side of the 1974 album with the same name. Unbelievably, for an almost entirely synthesizer-based song with German lyrics, the single did well on both sides of the Atlantic, landing just outside the Top 10 here in the UK and at number 25 in the US. Subsequently, on the strength of the single, the album reached the Top 10 in both the UK and the States. The rest, as they say, is history...

Given his formal, classical music background and training, I asked Karl if he had had any interest in electronic music prior to joining Kraftwerk. Fascinatingly, his answer suggests that his subsequent pivotal involvement in the genre was purely coincidental...

"No. You see, when I started studying classical music in 1970, I had already spent a couple of years playing drums and guitars in bands; doing all that pop music stuff. Then there came a time in my life, during my early twenties, when I thought, 'Music should be my lifetime profession.' So, being a typical German, I started studying music seriously, because I wanted to be a professor, or at least play in an orchestra. On top of that, I also had a background in jazz, so I wasn't surprised at all when I joined Kraftwerk. It was just a normal thing for me, as I was already well into improvising, which they did a lot of then — whereas a lot of classical music people can only sight-read.

"Also, if you start playing drums on a classical level, you are confronted by all kinds of different compositions by people like John Cage and Karlheinz Stockhausen. In the '50s and '60s, they were already using techniques like miking big gongs and other percussion instruments to create unusual sounds. Sometimes I had to repeatedly play one instrument for 10 seconds, constantly slowing down the beat, or whatever — so I was always dealing with these weird scores with

electronic music is that now it's all around us. The first 10 positions in the charts are always filled with crap techno sounds. They're so over-used that I can't really work with those sort of sounds anymore; I'd rather invent my own. The Prodigy are a cool band, and they are using samples all the time as the basis of their sound, but at the moment, I personally wouldn't do this: it's like wearing somebody else's used underwear! I like creating something from scratch."

"On the new record, I did *start* by playing the tracks into the sequencer, like I used to do in Kraftwerk, but they turned out to be very electronic and '80s-sounding. Then I discovered this method with layering guitars that I was talking about earlier. As soon as I put a guitar on there, it changed. It evolved from a so-called techno track into something which girls could also relate to. I researched this with my wife."

You might raise an eyebrow at this, but Karl is at least 50 percent serious. "One of the main drawbacks with electronic music in the past was that it somehow seemed to only appeal to boys. I think it's a technical attraction thing. Guys are turned on by motorcycles or cars, and it's the same with electronic music. But as soon as soon as you put some guitars on it, girls think it's more accessible and human! Anyway, that's the sound I'm after now. Also, if you put guitars on a track, you don't have to worry about the mid-range. You don't have to think about filling it out or creating unusual rhythms like in hip-hop music, or whatever. You just have a really structured, singalong song, immediately. I'm already writing new songs. If I'm sitting around with nothing to do for an hour or two, I find myself sitting there with the guitar, strumming along and *voila!* — there's a new song."

KRAFTWERK — THE KARL BARTOS DISCOGRAPHY

- *Radio-Activity* (1976)
- *Trans-Europe Express* (1977)
- *The Man Machine* (1978)
- *Computer World* (1981)
- *Electric Café* (1986)

Kraftwerk in 1978. Left to right: Florian Schneider, Ralf Hütter, Wolfgang Flur, Karl Bartos.

strange graphics. I was pretty much used to it all, and knowing this, Kraftwerk had called my music professor, as they wanted a classically trained percussionist, with a rather European, German, post-war approach; not an Anglo-American pop music approach.

"When I first joined Kraftwerk, I found myself playing mostly improvised music on VDR radio in Cologne, where Stockhausen used to be based. The next big event was a concert at The Olympia in Paris, and then we found ourselves performing on Broadway at the Beacon Theatre! It was really cool."

Along with Wolfgang Flur, Karl undertook pioneering electronic percussive work for live Kraftwerk shows throughout the '70s, and was also credited with electronic percussion on albums as late as 1978's *The Man Machine*. By 1981's *Computer World*, his role had expanded somewhat; he was also credited with music co-composition on all seven tracks alongside group co-founder Ralf Hütter, while Hütter's original partner Florian Schneider was only involved with four by comparison. Karl described the evolution of his position as follows:

Continued on p54 ▶

Continued from p53

"When I played the American *Autobahn* tour in 1975, the record was already done. Next, I played all the drums on *Radio-Activity* and *Trans-Europe Express* — live! Until this time I was just a drummer — then I became a co-composer with Ralf on *The Man Machine*, *Computer World* and *Electric Café*, where I also sang the vocal track on 'The Telephone Call'. Unfortunately, work then started on *The Mix*, but I had to move on."

Between the release of *The Man Machine* and *Computer World*, Kraftwerk totally rebuilt and remodelled Kling-Klang studios. Most of the group's equipment was installed in custom portable racks (designed by Wolfgang Flur). This allowed Kraftwerk to effectively take their studio out on tour with them, so that when the group undertook the worldwide *Computer World* tour following the release of that album, they were able to use the same layout for the equipment on stage as they did in the new studio.

The tour was an unqualified success, both artistically and technologically. As Karl recalled, "The idea came basically from Ralf and Florian. They wanted to have a kind of musical laboratory and make the consoles look very scientific. The idea was to put everything on wheels so it could easily be taken on the road; we could now perform and record anywhere in the world. The concept was really, really good, I think, but it was very time-consuming to put it all together — and equipment then was a lot more expensive than it is now."

Groundbreaking as *Computer World* was when unleashed in May 1981, some frankly ridiculous media claims were made at the time, including the idea that *all* the music on the album was 'played' by computers, like today's MIDI-driven extravaganzas. In reality, however, as Karl explains, commercially available analogue polysynths of the time were employed on both the album and tour, with Ralf playing the popular Sequential Circuits Prophet 5, whilst Florian hooked up a custom-built flute 'synthesizer' (which he had designed and built himself) to a Polymoog. Similarly, the electronic 'robot voice' on the album's title track is in fact nothing more than Texas Instruments' then popular 'Speak & Spell' educational electronic games machine — very hi-tech!

A rare picture of the interior of Kling-Klang from around this period reveals that the group owned at least one Roland MC8 MicroComposer, one of the first free-standing sequencers. At the time, a Roland advertising by-line suggested that the MC8 represented "A new concept of control for a new era in electronic music composition" — but as Karl now laughingly reveals, "It was crap! We never used it on any recordings and wasted a hell of a lot of time on it, actually. Instead, we used custom-built, very big, analogue-style sequencers with 32 steps. They were cool! I had something similar built for our drums; an '808-style concept where you could watch the LEDs going along and change the rhythm as it was playing."

Much of this intriguing gear was built by the Bonn-based firm of Matten & Weichers — or "Synthesizer Studio Bonn," as Karl affectionately calls them. "They were the only company doing this stuff at the time. They were just students; they started in a cellar under a disco, somewhere in Bonn. They sold the first Minimoog synthesizer in Germany."

Seemingly out of the blue, Kraftwerk scored their greatest commercial success to date when 'The Model', taken from 1978's *The Man Machine*, topped the UK singles chart in December 1981. Having inspired numerous acts, from David Bowie (an avid admirer of

Autobahn) to Gary Numan (particularly his 1979 hit 'Are Friends Electric?') it seemed Kraftwerk's own synthesized vision had finally been vindicated.

However, instead of capitalising on their success, the group released no more records until July 1983, when they released the 'Tour De France' EP. The fortunate inclusion of the title track on the soundtrack to the hit movie *Breakdance* in the same year helped increase the group's already substantial black American following, and helped pave the way for the Chicago House music and Detroit techno explosion of the late '80s. Kraftwerk had begun down the long and winding road to becoming the 'Godfathers of Techno'...

Die-hard Kraftwerk fans will already know that 'Tour De France' was destined to feature on the aborted *Technopop* album, originally scheduled for a summer 1983 release. *Technopop* even got as far as being assigned a catalogue number by EMI, but was never released, and there has been much debate over the reasons for its failure to appear.

Karl's version of events is that the group had simply been dealt an unfortunate musical hand: "First of all, after we did the worldwide tour in '81, Ralf had a bicycle accident, and he almost died. He fractured his skull and was away for nearly a year. He hadn't been wearing a helmet; he does now! That was the time when we did 'Tour De France', which was supposed to be the first single off *Technopop*. The single came out, but then this accident happened and it took us a year to continue.

"Then we got a little bit lost in technology, to be honest. Suddenly, in the mid-'80s, all this digital equipment appeared, including sampling; and there was this fantastic record called 'Beatbox' produced by Trevor Horn [*later re-released as 'Close To The Edit' by the Art Of Noise — mid-'80s Ed*]. His drum sound blew our minds! So we had to step back and think it all over, incorporate MIDI and sampling, and a lot of other stuff.

"When the *Technopop* record was eventually finished, Ralf flew to New York and mixed it at The Powerstation. The sleeve and everything was done, but Ralf felt insecure about it, and thought we should do the whole production again in New York and call it *Electric Café*, so we did. I think it was a mistake, but that's just my point of view. I mean, it's OK like it is now; especially 'Musique Non-Stop', which is a great song; but I think we should have released the *Technopop* version, because it's much better. Somehow, it's now available as a bootleg record..."

At the time of the 'Tour De France' EP in 1983, Ralf Hütter talked about incorporating cycling-related noises like bicycle chains, pedals, gear mechanisms, and breathing into Kraftwerk's sound; an obvious reference to sampling. I asked Karl when the group become involved in sampling, and what equipment they used. Neatly sidestepping the main part of the question, Karl points out that sampling of a kind has been around since The Beatles first used tapes of flute sounds (on a Mellotron) in 1966's 'Strawberry Fields Forever', before answering the second half

"They did all that, and there's really no difference between using tapes and digital machinery. In '86, on *Electric Café*, we used the first Emu Emulator."

It's been suggested that Kraftwerk, after James Brown, are probably the most sampled group of all

Continued on p56

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Roland

MARTIN AUDIO

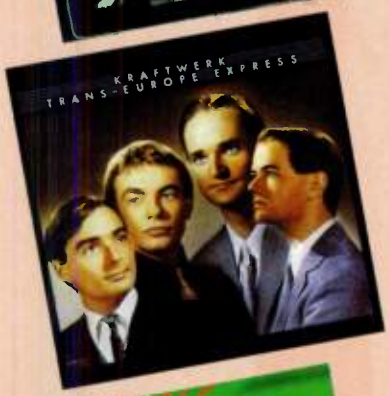
Continued from p54

time. Certainly, the group were involved in one of the first cases of breached track copyright, when Afrika Bambaataa famously used the melody of Kraftwerk's 1977 track 'Trans-Europe Express' coupled with the rhythm track from 1981's 'Numbers' on his proto-hip-hop 'Planet Rock' single.

On the issue of sample copyright, Karl philosophises, "It's really shit if somebody takes a whole record, like happened a couple of times with Kraftwerk, and just sings over the top. To do this, I think you must have clearance. It's cool if somebody calls and says, 'Can we use it?'. Incidentally, the Afrika Bambaataa guys called me up recently and I did a remix of 'Planet Rock'; that was a kind of double-recycling situation!"

As suggested elsewhere in this piece, all was evidently not well in camp Kraftwerk even prior to the arduous five-year production of *The Mix* compilation album — so much so that first percussionist Wolfgang Flur, and then Karl jumped ship prior to that record's eventual release in mid-1991.

Karl: "I did all the programming on that record; they didn't credit me, though. The original idea was to make a 'Best Of Kraftwerk'-type record with which to enter the '90s. This was a cool idea by Bob Kratzner from Elektra, our record company in the States; but Ralf wasn't keen on putting a record out without getting his hands dirty! Maybe he thought it was a funny business idea or something. It didn't really appeal to him, so he



came up with the idea of making a remix record. He was really thinking ahead, but I think if you made the original record, you shouldn't do the remix yourself. Somebody else should have done it."

Technology, once the theme that united the group, also began to have a divisive effect as the years progressed. Karl elaborates:

"When we did the first Kraftwerk gigs in the mid-'70s, it was all played live. Then we had a little sequencer built by a technician that could play 16-step sequences, and that, together with a Minimoog, Farfisa organ and our little electronic drum pads, was it. With that equipment we played all over America, coast-to-coast. Then for the next big tour in the early-'80s, we had little 4-track tape recorders, and they were locked in sync with these basic analogue sequencers, and that was it.

"Maybe technology got in the way, so to speak. It gives you a big advantage, but learning all about it takes away a lot of energy. I remember a time in Kraftwerk where I just sat around for two-and-a-half years reading manuals, programming a Yamaha DX7 with two Atari computers and two different types of librarians; changing envelopes or whatever, and not making one new composition!"

Eventually, matters came to a head in the '80s. When Ralf Hütter invested a huge sum of money in New England Digital's soon-to-become-obsolete sequencer/sampler, the Synclavier, Karl was dismayed: "I *told* him not to buy it; it was so terribly expensive! I mean, he bought it himself, but you couldn't even buy a car for what it's worth now. Technology's a dangerous field.

"This whole fascination with equipment was a thing of the '80s. I mean, obviously, *SOS* is a music technology magazine, but back then it was like surgery somehow — electronic boffins on one side, and on the other, so-called *real* musicians! People used to say, 'Those electronic artists can't play; they're just using technology to hide their disabilities' — like they were missing a limb or something!

"Now, in the '90s, everything is allowed; there's more crosstalk between musicians from different backgrounds. I mean, I can talk with Johnny Marr

about guitars *or* synths. The separation is a thing of the past. I remember a famous quote of Ralf's; 'The guitar is an instrument from the Middle Ages'. Well, so what? Books date from the Middle Ages too!

"It took me a couple of years to leave, although I started thinking about it after *Electric Café*. The longer we worked on *The Mix*, the more I felt a little useless. I wanted to play around with new stuff, but had to work on this boring project on a day-to-day basis. It was unbelievable. Nowadays I think the best thing I did — after studying music and meeting my wife — was joining Kraftwerk; and then it was *leaving* Kraftwerk! I really enjoyed being in there, but as far as I'm concerned, every band has its limits — a certain amount of time, then they are through." ❑

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YAMAHA

Has this company woken up from a deep sleep or what. I mean, this is the company that bought us DX synths, TX Synths and VL synthesis. And now this little wonder called the 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 CS1X & 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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ASR-X TURBO

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A3000

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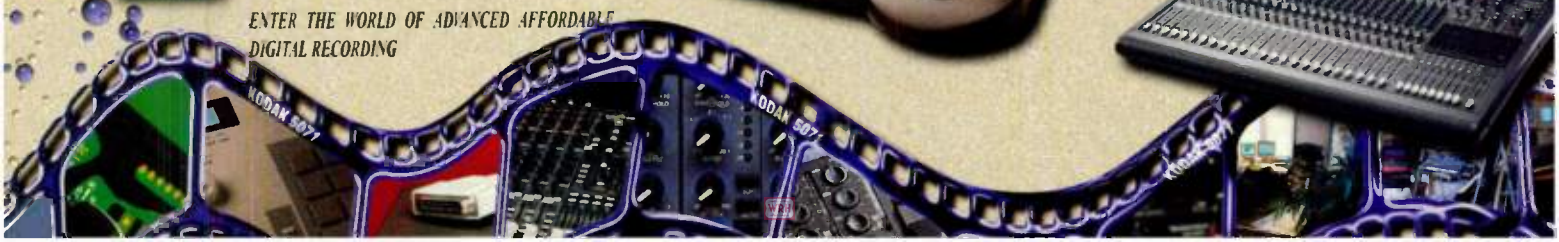

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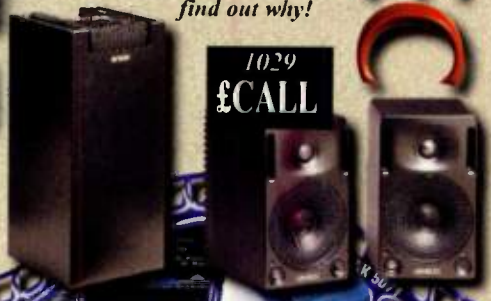

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KORG

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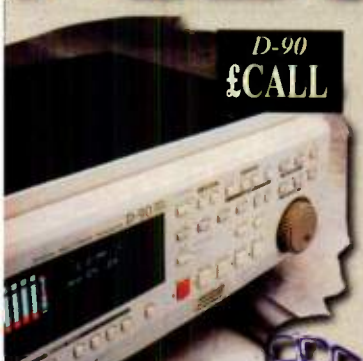
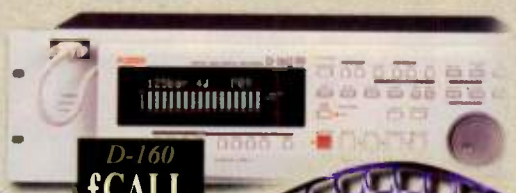
This is just what Fostex concentrates on when designing a product, their D90 8-track non-linear digital recorder provides all of these points in abundance as well as not breaking the bank. The D160 bears the same hallmarks as it's smaller brother yet with 16 tracks.





AKG

In 1953 AKG's classic C12 set the standard in valve microphones. Following an extensive R&D program designed to make this legendary technology available to a wider audience, AKG are now proud to present the SOLIDTUBE. By combining the latest solid-state manufacturing techniques with traditional AKG tube technology, the SOLIDTUBE recreates the classic, warm sound of the C12.

RØDE

Australian microphone designer Peter Freedman took the world by storm with his first release, the general-purpose NT2 large diaphragm condenser microphone. The mic features a low noise, transformerless design, a dual pressure gradient transducer with 1" gold-sputtered membranes, selectable high pass filtering, a -10dBV pad, and both omni and cardioid patterns. Yielding a crisp, pristine, yet smooth sound, the NT2 is an ideal choice for vocals and acoustic instruments. Comes complete with a shock mount, widescreen, and flight case.

The birth of Audio Technica's AT4033A has redefined microphone technology to the point that it is one of the most popular mics available today. It's uncomparable performance and accuracy come at a surprisingly low price so anyone can afford excellent vocals for their project.

audio-technica

The Complete Microphone *Solution*

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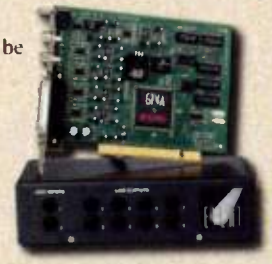
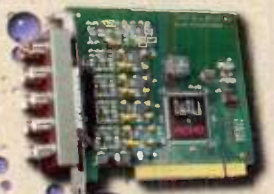
EVENT



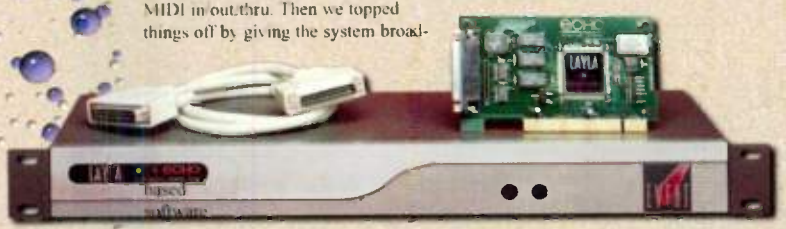
Gina is proving to be one of the most popular Multitrack recording cards we've ever stocked! Gina features S/PDIF I/O with up to 24-bit resolution, 2 in 8 out 20-bit digital to analog converters, full duplex operation and easy trim automatic input gain. A dedicated card for dedicated professionals, come and put it to the test! You won't be disappointed with it's performance or our price!



Darla is designed for musicians who think computer-based multitracking is an expensive hassle. It's also the perfect step-up solution for those who have tasted the awesome power of digital multitrack recording, but who aren't satisfied with the audio quality or channel limitations of their current audio card.

LAYLA 20-BIT

First the basics: Layla is designed to knock your socks off. It starts with a cross-platform PCI bus-master host card that connects to the rack-mount audio interface. The interface sports eight balanced 20-bit analog inputs, ten balanced 20-bit analog outputs, and 24-bit S/PDIF stereo digital I/O. It's also got massive on-board DSP, word clock (for sync and expansion), a 24-bit signal path, and MIDI in/out/thru. Then we topped things off by giving the system broad-



compatibility, making Layla perfectly suited for a wide variety of music production

E-MU

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 to you. Well EMU thank God have had a change of heart.

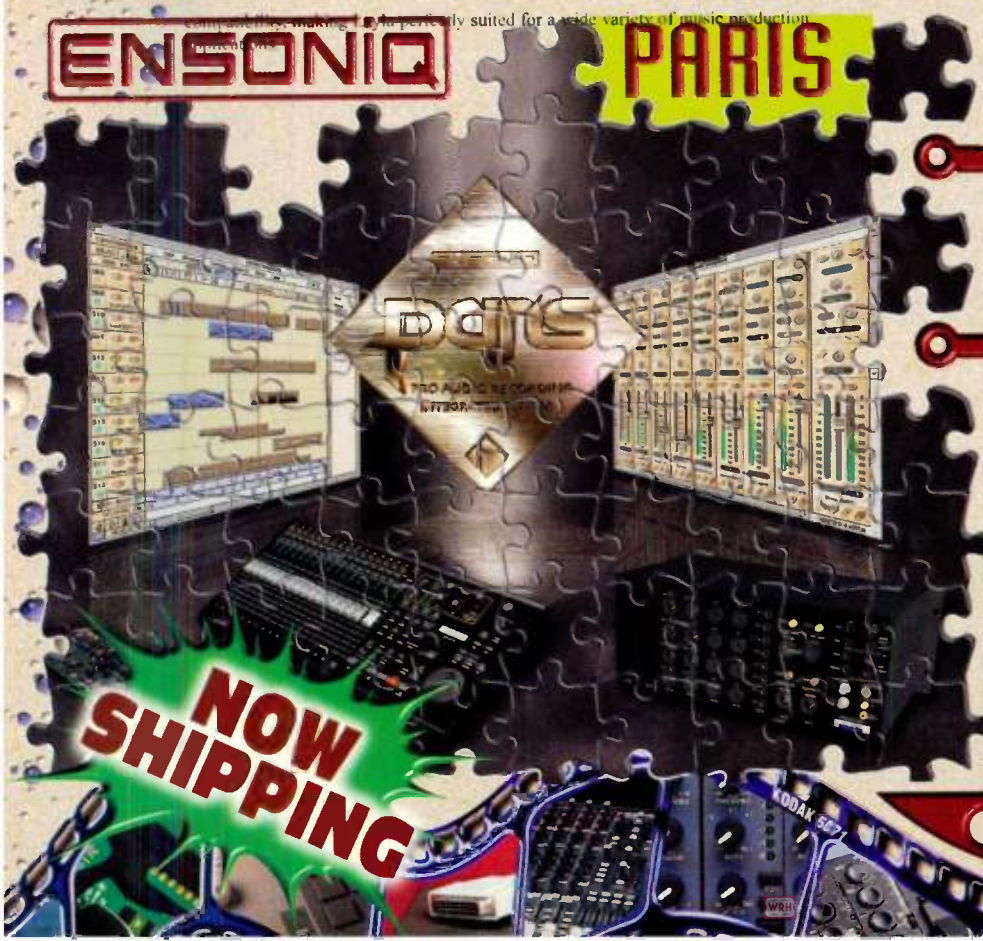
Exclusive to Music Connections we bring you that exact piece of equipment for the amazing sum of £1495 inc vat. Yes that's right just £1495. Now when we heard this news we had to stop and think? Is there anything that's comparable at anywhere near the price to this amazing piece of equipment. To tell 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 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.

DARWIN

exclusive

ENSONIQ PARIS



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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 expandable input/output modules. Powered by ENSONIQ DSP technology on a cross platform PCI card. PARIS delivers a total audio recording solution at a revolutionary price.

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digidesign®
A division of Avid

If you rely on Pro Tools, Mackie's HUI studio console can boost your productivity and your creativity!

PRO 24 TOOLS

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 utilising 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.

COMPUTERS

ATTENTION!

How many stores are advertising computer packages in this magazine, that frankly are virtually out of date? At Music Connections we don't do this, it's pointless. We will only spec a computer for you when you are ready to purchase. This policy ensures that you receive only the latest and best specified computer. Whatever computer package you see in this magazine it is almost certain we can better that package for you. So call us with your requirement and allow us to provide you with a system that will work, and one that we are prepared to give back-up and technical assistance to. Please do not go and buy a system off the shelf, when it doesn't work these people will not be able to help, as they have no idea how the system is supposed to work. You must buy the system from a specialist like Music Connections.

AKAI

GREAT NEW PRICES, CALL FOR DETAILS!

The AKAI DR range comes highly recommended as Digital Hard Disk Recorders with sophisticated non-destructive editing functions allowing near instant data access. The DR16 features a 16 channel programmable mixer as easy to use as a conventional MTR machine but gives true 16 track performance from a single hard disk at a highly cost effective price level.

We also stock all AKAI's other products as they excel in quality and value....just what you would expect from AKAI, and we offer exceptional prices on package deals...just what you'd expect from Music Connections.

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NEW

£299

PORTABLE SOLUTIONS

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!

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!

With all of the same awesome sonic advantages as the Dual Levelar and Pro VLA, the new Personal Levelar 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!

ALL PORTABLE SOLUTIONS £99

STUDIO TUBE FX

The Tube EQ provides you with stunning musical results at a truly remarkable price. Whether your a experienced recording engineer, live sound technician, or home amateur, you need at least one channel of high-quality studio equalization. Unfortunately, the EQ stages in affordable mixers simply cannot deliver the superior sound and flexibility offered by the tube EQ.

The Tube PAC from ART is a combination of the world's most popular tube mic/line preamplifier and optical tube compressor. ART engineers took the Tube MP and Tube Compressor and combined them into a single convenient aircraft-quality, extruded aluminium chassis. This new table-top design allows for easy placement in the studio or on the stage with immediate access to all the controls, features, and metering. In addition to being a tremendous vocal and instrument preamplifier and compressor package, this may well be the ultimate in tube direct boxes!

PRO MPA/PRO VLA

The PRO MPA Mic Pre-amp provides phantom power, phase-reversal, variable bass roll-off and balanced operation. It is all the more useful due to it's two large VU's making it easy to see during a gig. Ideal for use in live and studio applications, the PRO MPA is an essential part of any musicians set-up.

New to the tube MP family is the PRO VLA, this vactrol tube levelling amplifier is prestigious owner of the title 'Best Signal Processing Unit under $1000' according to Electronic Musician USA. Not surprising when you realise that it uses a VCA-less design for premium performance, opto-electrical and vacuum tube electronics and complete control over compression parameters and metering.

These units are tomorrows classics available today, and as we are offering them at Factory Direct prices you won't get a better deal. Come and try them for yourselves at all of our stores.

PRO MPA £399

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A R T

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PreSonus
Audio Electronics

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 processingfor studio recording, live sound reinforcement, broadcast applications and permanent sound system installations.

Blue Max boasts fifteen studio proven preset compressor and limiting settings for those instruments that need dynamics processing the most. Imagine, dialling up the perfect compression setting for that killer snare sound or putting vocals 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 detnt 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 usehalf rack space unit!

In addition to fifteen 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-borad metering allows shows input/output levelsand gain reduction. Blue Max can be operated in stereo or mono with high gain mono inputs for plugging in instruments. Blue Max aslo includes a side chain for de-essing, ducking and other forms of spectral processing.

Inputs and outputs are 1/4" TRS unbalanced. Operation is switchable +4dBu or -10dBV. The power transformer is switchable for international operation. Blue Max is housed in a single 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.

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 bleeps and thwaps can effortlessly be coaxed out of this little baby. It really hits the sweet spot!

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 broadcastand permanent sound installation. In any application the ACP 22 provides two echannels 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/-6dB). The ACP-22 also has a unique 1.o Pass gate filter which eliminates cymbals and other higher frequency range instruments from opening up drum and/or vocal gates without effecting the audio output. Independent gate key side chain is included in for external triggering and precise filtering. LED's on the gate show gate position open or closed and gate range (-60dB/-6dB).

Inputs and outputs on the ACP-22 are either XLR balanced or 1/4" TS unbalanced. Each channel operates at +4DBU or -10DBV, selected via rear panel switch. The ACP-22 is housed in a one rack space, all steel cahssis. In keeping with the Presonus "no wall wart" tradition, an internal power supply with voltage (for international use) is standard.

MUSIC CONNECTIONS

MC

DEALS Part-ex

CHELMSFORD

AKAI S3200XL 32MB	£1800
NORD LEAD 2 KEYBOARD	£1300
DIGITECH STUDIO 400	£600
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ROLAND JD-800 inc. CARD	£1000
KORG M1	£899
ROLAND JX 10 + PG300	£799
YAMAHA DMP11 AUTOMATED MIXER	£580
ROLAND M480 48 INPUT MIXER	£680
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GEM WX2	£450
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OBERHIEM OBX	£599
KORG DWS 8000	£295
ENSONIQ SQ	£150
KORG AUDIO GALLERY	£35

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ALLEN & HEATH SABRE	£2700
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E) TASCAM M1624 + DARWIN & LOOMS £2695

F) YAMAHA MD4.....£599

G) TASCAM 564 & TUBE MP £799

H) PRESONUS ACP-22 & TASCAM 564 .....£395

I) KORG PROPHECY .....£CALL

J) YAMAHA MX12/4 .....£299

Lost in Music?

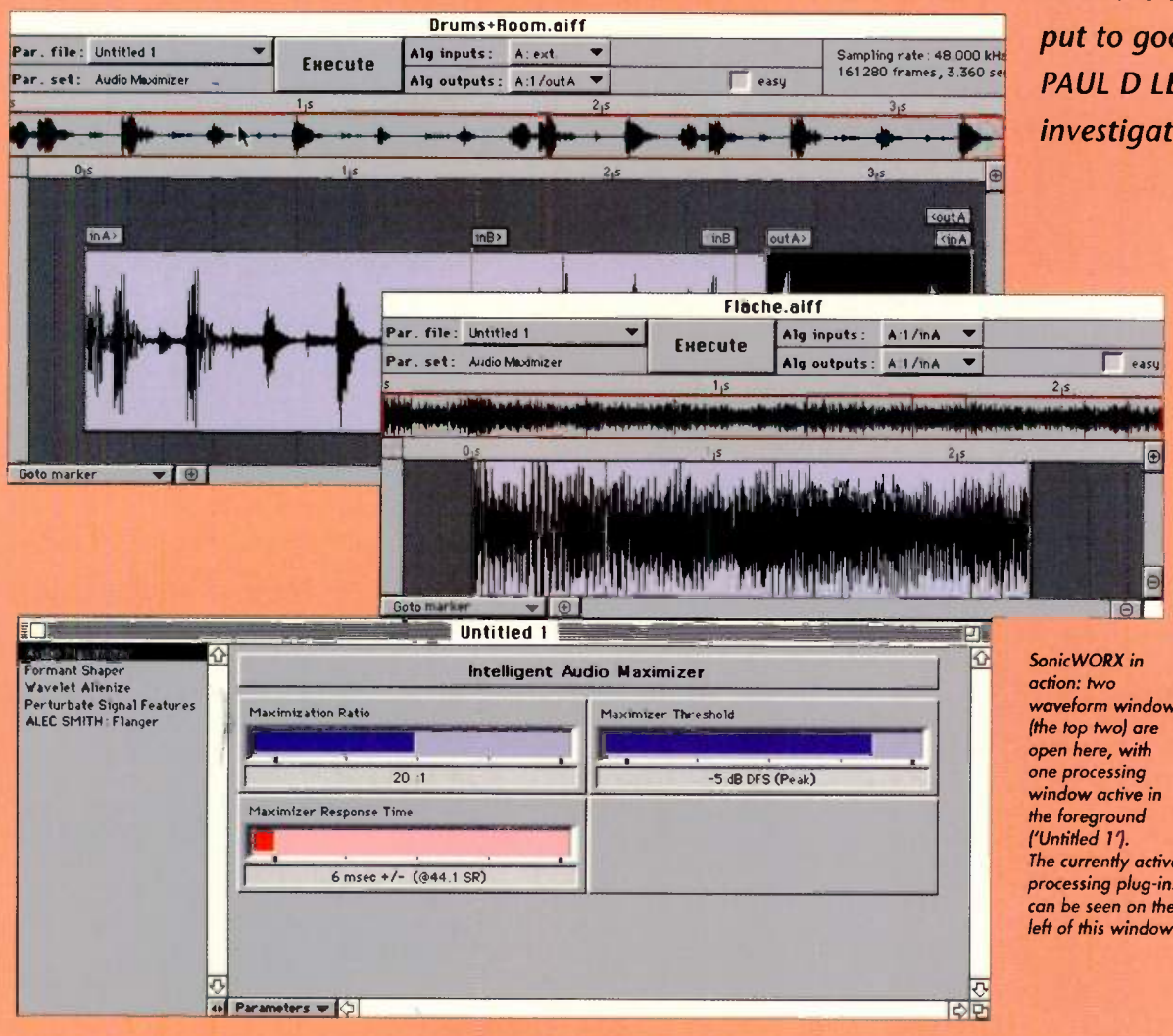
PROSONIQ *SONICWORX ARTIST* AUDIO EDITING SOFTWARE FOR MACINTOSH

Prosoniq, the German software company behind many of the DSP processing algorithms used in MIDI + Audio sequencers, have now made the powerful fruits of their expertise available in stand-alone form. But can the software actually be put to good use? PAUL D LEHRMAN investigates.

SonicWORX Artist is fascinating audio editing software for the Macintosh from a German developer called Prosoniq. Though their name may seem unfamiliar, you may have seen or used the products of their labours, as Emagic have licensed Prosoniq's audio processing algorithms for use in *Logic Audio* (the pitch-shifting algorithm found in *Logic*'s Time Machine II, for example, is a Prosoniq development, as is the on-board EQ, flanger, and reverb), and the company also produces third-party plug-ins for *Cubase VST*.

According to Prosoniq, *SonicWORX* employs 'neural net' technology to analyse audio signals in unconventional ways, and then lets you apply extremely off-the-wall processing to them. Ordinary sample-editing functions are included, but in a perfunctory sort of a way (there are no precise timing indicators in the display, for one thing), and thus it should not be used as anyone's sole audio-editing program — you'll still need BIAS' *Peak*, *SoundEdit 16*, or the venerable *Sound Designer II*. But this package will take sounds where they haven't gone before, and if you're willing to invest some time learning about the types of processing it provides, you may be rewarded with a highly expanded sonic vocabulary.

The program is one of three from the company: another package, *SonicWORX Studio*, is designed for mastering and post-production facilities, and emphasises practical functions like de-clicking, phase alignment — of concern to those still cutting vinyl — and sample-rate conversion, rather than the more creative functions found in the *Artist* package. The third product, *Professional*, promised for later in 1998, will combine the two existing products, and add a voice-extraction feature which can either isolate or eliminate lead vocal tracks from a mix. ▶



SonicWORX in action: two waveform windows (the top two) are open here, with one processing window active in the foreground ('Untitled 1'). The currently active processing plug-ins can be seen on the left of this window.

PROSONIQ *SONICWORX ARTIST*

pros & cons

PROSONIQ *SONICWORX ARTIST* v1.0.2 £299

pros
- Very powerful.
- Tons of algorithms.
- Good sound quality (when you want it).
- Can make a sound file out of anything.

cons
- Poor manual.
- Clumsy user interface.
- Obscure, unexplained processing parameters.
- Often impossible to make it do what you want.

summary

SonicWORX Artist contains some of the most powerful sound-modifying tools we've seen yet, and the program is potentially brilliant, but so far it is critically hampered by an uninformative manual and obscure operating parameters.

SOUND ON SOUND

Installation is from three floppy disks, and couldn't be simpler, with copy protection provided by a hardware dongle. The software uses the internal Macintosh sound drivers (with Sound Manager 3.1 or later), and will work with Digidesign I/O hardware provided you have the proper drivers and INITs in your System folder.

SonicWORX Artist was originally conceived for Silicon Graphics workstations, but the port to the Macintosh is pretty seamless. Theoretically, this version of the program will work on both 680x0- and PowerPC-based computers, but on older machines I imagine the wait times for the processing would be unbearably long. In fact, the manual mentions how the 'save after execute' function (which is useful for processing which takes overnight to finish) will be 'appreciated' by 68k Mac owners. While overnight rendering is a fact of life in the computer graphics world, no sound designers I know have that kind of patience. The *Studio* version of the software won't run on 68k Macs at all [*as this review was being prepared, Prosoniq announced early plans for version 1.5 of* SonicWORX Artist, *in which all support for 68k Macs has been abandoned — Assistant Ed*].

Since the program does all of its storage and housekeeping on hard disk, it runs surprisingly lean, requiring only 8Mb of RAM to function quite smoothly. Of course, you'll want plenty of empty disk space to store your experiments, but you know that.

OPERATION

On the face of it, the user interface is very simple. There are two windows: one to display the waveform, and the other to manipulate the processing parameters. When a file is open in the waveform window, you can cut and paste or otherwise move it around, and select part or all of it for processing. You can specify different parts, or 'ranges', of the file as input and output 'channels' — for example, take a processed version of the first part of a sample and replace the second part of the sample with it; or if you are using an algorithm with two inputs, such as Morphing, you select two input ranges and a third range for output. You can have multiple files open, and they can interact with each other: a range from one can be used as an input channel to affect the audio in another.

> "In just a few minutes of fooling around, I was able to turn Dusty Springfield into Darth Vader, and make a drum loop sound like it was falling off a lorry in a tunnel full of water."

You can open any standard audio file format, although the manual recommends converting WAV files into AIFF format before you open them, using some other program (would it really have been so hard to build this in?), because of the way offsets are handled in the WAV format. In fact, as with the well-known audio editing shareware *SoundHack*, you can open *any* binary file, from text, to pictures, to an *Excel* spreadsheet, in the program and treat it as audio data. No doubt this has some fun applications, but unfortunately neither the manual nor the example files that come with the program tell you anything about the creative possibilities this could afford you.

When it comes to saving files, the program will create mono or stereo files, using AIFF or *Sound Designer II* format, with 8-, 16-, or 24-bit word lengths, at any sample rate. There are no provisions for exporting to a sampler over MIDI or SMDI, or to a Digidesign Samplecell card — you'll need *Peak* or *Samplecell Editor* for that.

The second window is where you set up your processing parameters. You open a new one of these with the New Parameter File function under the File menu, and select the algorithm you want to start with from the Algorithms menu on the left of the window. The various algorithms are provided as plug-ins, similar to (but not compatible with) Digidesign and Adobe *Premier* plug-ins, which go into a folder on your Mac alongside the application itself. The version of *SonicWORX Artist* I reviewed came with 57 algorithms, but an ever-growing selection of additional plug-ins, including some designed by users, is available from Prosoniq's website (www.prosoniq.com). The plug-ins themselves are very small — anywhere from about 9K to about 70K in size — so downloading groups of them takes very little time.

You can have multiple algorithms working at the same time, and you can save the lot as a Parameter File, which recalls all the algorithms in the order you loaded them, plus all of their parameters. This is a very important feature, as trying to recall which algorithms and which parameters do what can be very confusing, as we shall see.

COMPLEX PROCESS

The plug-ins are organised into 10 groups, each with its own sub-menu, and offer an astonishing variety of processing options. One group (the so-called 'Utilities') consists of fairly conventional algorithms, such as Fade, DC offset removal, Normalise, Reverse, Pitch-shift and sample-rate conversion. With the group entitled 'Mathematic Operations' you can combine files, subtract them from each other, multiply them for interesting modulation effects, and do Emu-style transform multiplication, which combines the spectra of two different sounds to create something with the characteristics of both.

The 'Envelope and Dynamics' group of plug-ins allow you to extract envelopes from one sound and apply them to another, or invert a sound's volume envelope. The 'Frequency Domain Filters' group provides several types of vocoders, a

The award-winning MPX 1...

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Axis Audio – Stockport – 0161 474 7626
Blue System – Safron Walden – 01799 584095
CTI – Dublin – 00 353 1 454 5400
CTS – Kirkby – 01623 721 222
Dawsons – Warrington – 01925 632591
Digital Village – Barnet – 0181 440 3440
Eddie Moors Music – Bournemouth – 01202 395135
Funky Junk – London – 0171 609 5479
KGM – Wakefield – 01924 371766
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Marcus Music – Belfast – 01232 322871
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WRH

'formant-conscious' equaliser which lets you change the tonal characteristics of a voice which has been pitch-shifted to make it sound more natural, a Desaturator which lets you emphasise harmonic 'dirt' in a file, and a multi-band enhancer. The 'Spatial and Phase DSP' group includes an algorithm that creates room reflections, and another that actually *removes* reverberation from a file.

The 'Timebase and Pitch conversion' group provides the usual pitch-shift and time-compression/expansion functions, but it also has a Pitch Designer, which breaks the sound down into various tonal components and changes their pitch independently — so for example, you can literally isolate a kick drum and raise it up in pitch without affecting the rest of the track. The Dynamic Evolution parameter even changes the amount of pitch change over time. In the 'Special EFX/Sound Design' category are telephone filters, vinyl-noise creators, drum loop "jungle-isers", an algorithm that uses pitch-shifting and delays to create 'crowds' from a recording of a single voice, and others that add various types of unusual distortion, including a wild so-called Wavelet Alienise feature, which creates harmonic distortions that are pitched inversely to the original source.

Finally, there are the 'Audio Rendering' plug-ins, which include several different morphing algorithms, and an Apply Features function that imposes the timbral features of one sound on another.

Once you set up your parameter file (and you can have multiple parameter files open on the screen, although only one can be active at a time), you select the waveform you want to process, and click the big Execute button in the waveform window. The button gives you a progress report on the processing (in percent), and the waveform is redrawn at the end. Operation seems generally quite fast. The speed of any processing, obviously, will depend on the length of the file and the complexity of the algorithm(s), not to mention the speed of your computer, but on a 100MHz Power Mac, using mostly files a few seconds long, I never felt I had to wait unduly. An extremely useful feature (especially because there is no Preview function *per se*) lets you listen to the processed parts of the waveform before the software has finished calculating, and if you don't like what you hear, you can abort the operation by pressing the usual Command-full stop key combination.

If all this is starting to make you drool, I don't blame you. There's an enormous amount of power under the bonnet of this program, and the transmogrifications it can perform on your sounds are astounding. In just a few minutes of fooling around, I was able to create a singing cymbal, turn Dusty Springfield into Darth Vader (and still have her remain on-key, more or less), and make a drum loop sound like it was falling off a lorry in a tunnel full of water.

HOW DID I GET HERE?

The downside of all this, however, is that I couldn't possibly tell you what I did to create these effects. I could save the parameter files (and I did), but since what a sound processing algorithm does (in any application) is so dependent on the source material, were I to give you the parameter files for you to use on your sound files, you would get completely different results. I'm not exactly a novice at sound design, but I quite simply had no idea what I was doing when I was setting up the various algorithms. And this is the fault of Prosoniq, who have fallen down badly in explaining to the user what is going on in its product (see the 'Flying Blind' box elsewhere in this article). It's really a shame, because this could be a formidable tool, if only anyone outside of its designers could figure out how to use it.

COUNTER-INTUITION

The software itself doesn't help much, and there are some counter-intuitive features that will create even more confusion. As I mentioned earlier, there are no precise timing indicators anywhere, so setting up edits that follow exact timings or tempos is pretty difficult. The two-window construction means that you are constantly mousing back and forth to make adjustments, and to activate something in a non-active window, you have to double-click on it. You can avoid this by using command-click, but that ties up one hand.

A notable exception is the Execute button in the waveform window, which regardless of which window is currently active, requires only one click. Unfortunately, that button's visual response is delayed, so you may not think you have pressed it when you actually have; if an operation is very fast, you can end up executing it twice. There is only a single layer of Undo, so it's very easy to mess things up to the point where you can't get them back — BIAS *Peak*'s unlimited, catalogued Undo feature would have been extremely welcome here. There's also no Redo function, but there is at least a Compare feature, which lets you listen to the last version of a file without undoing the most recent bit of processing you've done. But once you Undo it, it's gone.

Speaking of buttons, there's no on-screen Play button — you have to use the space bar — but since the biggest button on the screen is Execute, I found myself hitting that quite often when all I wanted to do was hear the file. Needless to say, this caused a certain degree of upset.

Other aspects of the user interface are also annoying. The parameter controls use 'fluid' bar graphs which give it a nice feel, but don't add much to the program. The input and output ranges in the waveform window look like the markers in any other sound-editing program, but you can't move them by hand: you can only select a region and say "Put 'em there!" If you want to move just one without disturbing the other, this can be a

FLYING BLIND?

The manual, besides being not particularly well translated from the German, is vague and unhelpful about how the various processing algorithms on offer work, what they are doing, and what the parameters mean. The more complex the algorithm, the worse it gets — many of the most obscure and important parameters are expressed in 'units' that have nothing to do with the real world, and so setting them is an exercise in flying blind.

Some attempt is made to explain what the program is doing at the beginning of the manual; there's a little essay about applications of neural nets in audio processing, and there's a short discussion buried in the section on the software's Preferences menu item, about the so-called 'Multiple Component Feature Extraction' process that it uses to analyse files. But both of these texts are woefully inadequate when it comes to explaining how to actually *use* the program. There is an introduction that contains a one-page tutorial which will only have you scratching your head, and there are no tutorial or even example files included with the software, except for four rather silly audio files.

Perhaps the developers don't think users are really capable of understanding what's going on, so why should they bother writing an informative manual? Or perhaps they think all users are so knowledgable about these concepts that they don't need a manual — the '*Real* engineers don't read the docs' attitude. Perhaps they just didn't think it was worth spending the money to write a good manual, or perhaps they are being deliberately obscure in order to protect their processes from imitators. Or perhaps the whole thing is really just smoke and mirrors, and the concepts they explain so perfunctorily aren't really worth much at all. But whatever the reason (and you are welcome to think up your own), they do themselves a major disservice by keeping potential users so ignorant.

pain. You can easily select the area within a range, but there's no way to select quickly the area outside a range, so there's no fast and accurate way to, for example, break up a file into two ranges that butt up against each other. As you click around, it's remarkably easy to get the waveform window confused — it will actually show parts of selected regions as un-selected, and vice versa. Much of the time, therefore, you have no idea what you're looking at, and have to re-size the window (there's a Redraw function, but it doesn't fix this) to get it right.

FOLLOWING ORDERS

Once you bring more than one algorithm into a parameter window, you can't change the order in which they process the sound; any new algorithm brought in goes at the end of the list. Should you want to place it anywhere else — for example, put the de-reverberator in front of a vocoder — you have to delete all the algorithms that come after it, load the new algorithm, and then re-load the ones you just deleted. Unfortunately, all of the parameter settings for the algorithms you've deleted and re-loaded are then lost! It might help somewhat if you could use other parameter files for temporary storage of modules, but since you can't cut and paste algorithms between parameter files, that doesn't work. There is also no command-key equivalent for Delete in the parameters window, which means a lot of extra mousing.

The way the program handles stereo channels and inputs and outputs is confusing and inconsistent. I got it to create a 3-channel *Sound Designer II* file, which is something of a crime against nature — no other program will deal with it. Some of the processing algorithms are designed to handle stereo audio, and provide proper correlation between the two channels when they are being processed, while others aren't — but you have no way of knowing which is which.

And am I being too picky when I complain that some of the dialogue windows (like the Save As... one) have not been translated from the German? I know what a Cancel button looks like, but what about the poor mono-lingual English speaker who's never seen one before and is confronted with a button labelled 'Abbrechen'?

YOU CAN'T ALWAYS GET...

As for the quality of *SonicWORX Artist*'s processing, it's a little hard to evaluate. The pitch-shifting and time-compression algorithms seem no better or worse than those found in other programs. The room simulator is decent, and the reverb remover is interesting, but unconvincing. The morphing algorithms are very powerful, and certainly do radical things to the sound. In general, it's extremely easy to make ugly sounds with a great many of the algorithms — in fact, some of them (Spectral Erosion, for example) are expressly designed for that purpose. Certainly, if nasty is what you're after, you'll find plenty to play with here.

But making sounds that are interesting *without* being ugly takes a little more care, and given the vagaries of the user interface and the documentation, that can be difficult. Without a good understanding of what the algorithms are doing, the user is at their mercy, and (except for the most rudimentary processing) deliberately trying to go after something specific, as opposed to stumbling over something that you might be able to use, is pretty much out of the question. There's a lot to be said for experimenting, and fooling around, and arriving at things serendipitously. But for users to want to do that, using the software needs to be *fun*; and this program is not that.

In its favour, the software is quite robust, and I experienced few operational problems. I was, however, able to get it into an inescapable loop by trying to graft a sample recorded at one sampling rate onto the end of a sample at a different rate. I was presented with an error message, which I could click away, but then it would come right back. I had to force-quit the program, and of course I then lost all my unsaved work up to that point.

Working with *SonicWORX Artist* is sort of like driving a Lamborghini with one forward gear: you know there's a lot of horsepower there, and it may get you where you want to go eventually, but it's not very enjoyable. The developers are to be applauded for making so much power available to Macintosh users, but until they straighten out their user interface and documentation issues, I would look elsewhere for my sound-processing toys. SOS

info

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MOTU go Native!

MARK OF THE UNICORN *DIGITAL PERFORMER* v2.11 FOR MAC

Nearly two years after everybody else jumped on the Power Mac audio bandwagon, Mark of the Unicorn have finally come on board with their flagship sequencer, which will now record and play back audio without the need for external hardware. Has it been worth the wait? DEREK JOHNSON finds out.

Mark of the Unicorn's *Digital Performer* is certainly a member of one of the top four Macintosh sequencing families — the others being Steinberg's *Cubase*, Emagic's *Logic*, and Opcode's *Vision* — but a maverick streak at the company means that it has always stood slightly apart. There are two reasons for this: firstly, MOTU have not grasped the Opcode-originated Open Music System (OMS) in the same way as many MIDI software developers. Instead they've ploughed ahead with their own FreeMIDI system, which achieves basically the same goal, in a slightly different way, routing MIDI data from the outside world to the sequencer and back, via a MIDI interface (simple or multi-port) attached to your Mac's serial port(s). In addition, it provides a certain amount of inter-application communication within the computer itself (such as with MOTU's editor/librarian *Unisyn*). Successive versions of FreeMIDI have enhanced its compatibility with OMS, but it still retains its own particular flavour.

The other big MOTU difference is that while all four major Mac sequencer players have become available in MIDI + Audio versions, whereby digital audio tracks can be recorded and manipulated alsongside MIDI sequences, MOTU took their time when it came to supporting Apple's Sound Manager extension. Thus, *Digital Performer* has not been able to record audio using a Power Mac's own built-in hardware, meaning that it remained the only package dependent on third-party — effectively, until recently, Digidesign — hardware for the recording and playback of audio. This is now history, since the introduction of v2.1 late last year finally added Sound Manager support to *Digital Performer*, bringing it level with the other major players. It's now as valid a choice as its competition if you're looking for a MIDI + Audio sequencer to go with your shiny new Power Mac, and don't want to buy extra audio hardware.

The basic layout of *Digital Performer* is virtually identical to its audio-less cousin, *Performer*. *DP*, with its ability to record audio tracks, adds a dedicated audio menu, several audio-specific windows and a collection of audio tools. In some cases, audio tracks can even be edited using the same tools, and often at the same time, as MIDI tracks. The latest version of *Performer* has had a bit of a spruce-up (see the 'Improved Performance: MOTU & Upgrades' box for details and some surprising facts about *Performer* v6.0), and similar changes will be made to *Digital Performer* in an imminent update, but for now a look back at previous MOTU reviews in *SOS* should give you a feel for what's on offer: we last reviewed *Digital Performer* in September 1996 (v1.7), and other appearances include the ancient *Performer* v1.21 in November 1986, *Performer* v3.5 in October 1990, *Digital Performer* v1.4/*Performer* v4.2 in January 1994, and *Performer* v5.0 in October 1994.

THE MOTU MIND-SET

Although MOTU have put their own spin on nearly every aspect of their software, it essentially functions in a similar fashion to most MIDI sequencers. If you come to *DP* from another audio sequencer, you'll find familiar windows, but they'll often behave differently. The main Tracks window offers MIDI and audio recording with a tape recorder-like interface. Columns to the left provide track names, patch numbers, level meters, and so on. The left half of the display scrolls as a sequence plays. Differences come in how MOTU equip their windows, the Tracks window included: close, zoom and expand buttons are all different from, or not available on, equivalent Mac software, and nearly every window has its own mini menu, solo button and 'audible mode' buttons. The last option allows you to audition MIDI data or audio by simply clicking on them.

Most of the work involved in getting MIDI and audio into the software is undertaken in the Tracks window, but of crucial importance when it comes to assembling a song are 'Chunks'. Chunks are roughly equivalent to Group Tracks in Steinberg's *Cubase*, although MOTU's variety are a little more accessible (and allow you to include audio). Basically, any sequence you're working on in the Tracks window is a Chunk (whether you like it or not!), and Chunks can be chained and layered in a Song — the Song display is available from within the Chunks window. Chunks could be complex multi-channel sequences, or something as basic as a drum pattern. A Song can itself become a Chunk in another Song! You can see the potential: it's the ulitmate in pattern-based sequencing.

Once a recording is made, your editing functions are again familiar, but slightly mutated. First, there's the event list, which is very clear and straightforward; neat features include the grouping of notes that appear in chords. Data can be edited in a graphic editor, which uses MOTU's version of a piano roll, with a resizable continuous controller

pros & cons

MOTU *DIGITAL PERFORMER* v2.11 £549

pros

- Sound Manager support at last!
- Audio plug-in matrix, with the best free reverb available.
- Audio and MIDI nicely integrated.

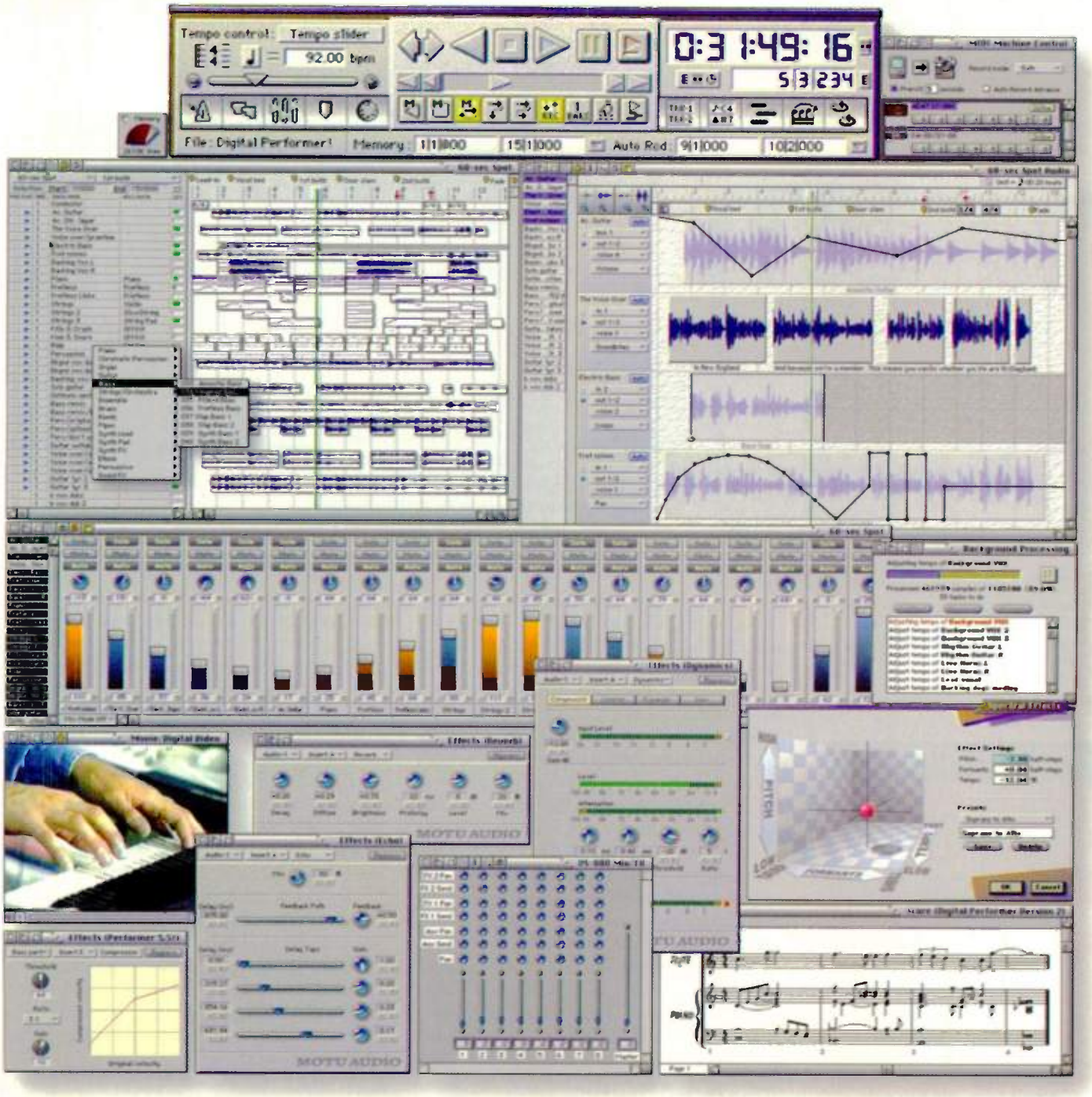
cons

- OMS compatibility good, but not quite seamless yet.
- MOTU's user interface may confuse some at first.
- Limited support (so far) for PCI audio cards.

summary

The previous lack of Sound Manager support has probably moved many potential *Digital Performer* users towards other software. Now it's included, there's no excuse not to move back and check out this well-designed and powerful program.

SOUND ON SOUND



grid at the bottom. For the musically literate amongst you, there's two choices: a notation editor features a scrolling staff, which behaves like the piano roll and has a controller grid at the bottom, or there's QuickScribe. Here, your MIDI data is presented in score form, with a selection of tools that wouldn't be out of place in a dedicated music typesetting package.

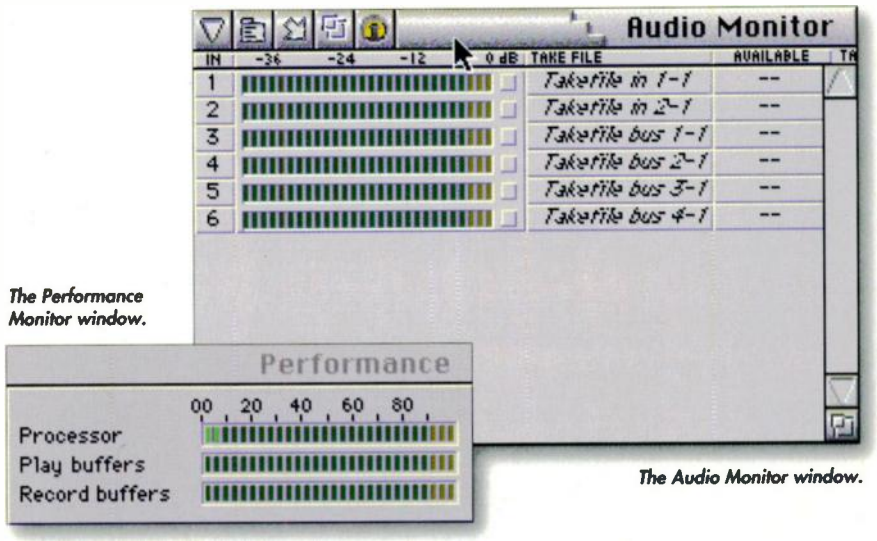
AUDIO

When it comes to recording and editing audio, *DP* v2.11 behaves in nearly the same manner as previous (external hardware-dependent) versions of the software — so much so that one of the five manuals is still a v2.0 digital audio guide. A slim v2.1 update guide discusses new features, such as the plug-in system, while reassuring the user that nearly all the features from pre-Sound Manager days have been retained in identical form. The few minor exceptions are listed and explained. An even slimmer v2.11 update guide introduces direct support for the BIAS *Peak* audio editor and Korg's 1212 I/O PCI card (see the 'On the Cards' box for more on this), and a fabulous new reverb plug-in. Dubbed *eVerb*, this effect will make you the envy of all your friends with other MIDI + Audio sequencers.

Working alongside Sound Manager is the new MOTU Audio System extension. From within *DP*, MAS provides you with an adjustable number of audio voices, internal busses, aux tracks, master faders and sends. The nifty new plug-in architecture is a part of MAS as well.

When you install *Digital Performer*, it automatically sets up a 'studio' for you, consisting of a number of audio voices (the number of audio tracks playable at once) and internal stereo busses, plus disk read/write and voice RAM buffer sizes. These figures are found in the Studio Configuration box under the Basics ▶

The Studio Configuration window allows you to tailor the parameters of your recording environment to suit your system's RAM, processor speed, and hard disk size.



The Performance Monitor window.

The Audio Monitor window.

WHAT'S THE DIFFERENCE?

NEW FEATURES OFFERED BY v2.1

- Sound Manager support for audio recording without extra hardware.
- Real-time effects plug-in architecture.
- MOTU Audio System (MAS) hard disk recording engine and mixing system.
- Bounce-to-Disk feature for optimisation of audio facilities.
- Drag-and-drop audio transfers between the Mac and samplers.

NEW FEATURES OFFERED BY v2.11

- Support for multiple MAS hardware drivers.
- Support for Korg's 1212 I/O PCI card.
- Support for Digidesign Audiomedia II and III cards.
- New *eVerb* plug-in.

▶ menu, and can be fully customised within the limits of your system's RAM, processor speed and hard disk size. A number of easy configuration options are available, from the four-voice Short to the 32-voice Blooter — is this an American program or what? — but you could choose three, seven or 11 voices, if these suit your purposes or system. For example, my 250MHz 6500 (with a 603 processor) is quite comfortable with 16 voices, and could happily manage more. Equally as important as the number of voices you choose is the disk read/write size (in kilobytes), and RAM buffer size per voice (in increments of 1000 samples). As a rule of thumb, your buffer size number should be three or four times the disk read/write size. A chart at the bottom of the box keeps you informed of how much RAM your 'studio' needs, and flashes a red warning if you exceed your system's resources. Other dedicated audio system tools are available for selecting input monitoring mode (use 'direct hardware playthrough' to avoid the Mac's annoying 50ms delay), and there's also a visual monitor for the audio input, and a system performance window to show you how well your system's coping.

With the advent of Sound Manager support come a number of neat tricks for controlling the audio as it heads to your hard disk. As it stands, with the Power Mac's stereo connections only two tracks at a time can be recorded, and everything is mixed to stereo. Users of *Cubase VST* will be familiar with needing to develop tricks to get audio into the software in the absence of level controls. It's a juggling act that involves getting the level right at source. This is not such a problem with *Digital Performer*; control is provided, from within the software, over Sound Manager's input level.

A particularly important audio window is the Soundbites window, a central warehouse of all your audio files, whether new recordings or imports from other software. All your recordings are listed here, with the audio events that appear elsewhere in the program being essentially clones. All editing is non-destructive, unless you actively wish to erase audio.

When it comes to editing and tweaking your audio, there are a number of options. The audio event list is similar to the event list used for MIDI data, and you can easily move, delete and insert audio and mixer events. Next up is the graphic editor, which again has a MIDI counterpart, and here audio can be cut, pasted and moved around non-destructively.

It would be too much to expect a fully-featured waveform editor to be included as part of a program such as this, yet a surprising amount can be done without taking your audio elsewhere. Of course, you can cut your audio into smaller chunks, erase silence, and even loop audio in the Tracks window. More advanced treatments come courtesy ▶

ON THE CARDS: EXTERNAL AUDIO HARDWARE

All the excitement about the latest version of *Digital Performer* centres on its support for your Power Mac's own audio hardware. But a natural extension of that support takes us into the realm of the affordable PCI audio cards released over the last year or so. Now, at least, we have some choice beyond nothing or relatively expensive Digidesign hardware: a Power Mac's audio capabilities are adequate for many purposes — records have been released using nothing but this hardware — but the specification could be better. It has to be admitted that the Mac's outputs can be a bit hissy and noisy. The first PCI card to be supported by *DP* is Korg's 1212 I/O. The Digidesign PCI-format Audiomedia III is also supported. The trouble is that both of these cards are 'full length'. You might think that PCI cards, being of a standard format, shouldn't come in different sizes, and I'd like to agree with you. But the real world isn't like that, so while Emagic's Audiowerk8 card, for example, is just seven inches long, the two cards so far supported by *DP* are nearly twice as long.

Why am I going on about this, you ask? Because my Power Mac, a 6500, comes in a case that doesn't easily accommodate full-length PCI cards! The external dimensions look promising, but whip out the processor board and peer inside and you're greeted by a cardboard shield. Remove this and you have to fight your way through a spaghetti-like collection of multi-way interconnection cables (my 6500 has a busy complement of hard disk, floppy, CD-ROM and Zip drives). It might be possible to wiggle some of these leads out of the way and massage a 1212 into place, but you could cause serious damage by doing it recklessly, and you could also void any warranty your machine might still have even if you succeed. Read your paperwork very carefully. If you're an adventurous owner of a Mac in a 6500-sized tower cases with the same kind of space problems (and have no warranty left), be careful, and protect the end of your 1212 as you install it; the board has several delicate components.

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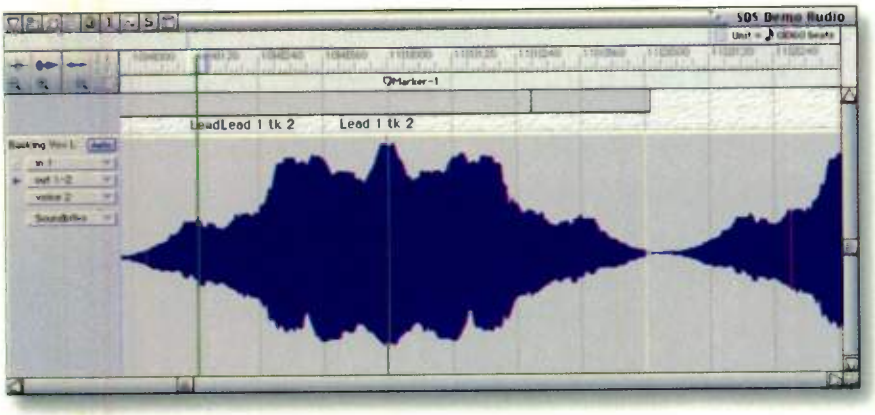

The Audio Editor.

▶ of MOTU's PureDSP technology, which offers sophisticated pitch-shifting, time-scaling, spectral effects and sample-rate conversion features, with superb formant control when pitch-shifting.

Should you require even more than this, your audio, or sections thereof, can be edited by an external editor, with a link from the Audio menu; at present, you're limited to Digidesign's *Sound Designer II* and BIAS *Peak*, but who knows what the future might bring? My vote goes to support for Stefan Daiano's shareware *tour de force D-SoundPro* — any takers, Mr MOTU?

If you haven't got either of the supported editors, you could import audio and use, say, *D-SoundPro* (which can load and save SDII-format files), and then re-import the audio. Or, if you have a supported SCSI-equipped sampler, it's also possible to drag and drop audio between *DP* and the sampler, using SMDI (SCSI Musical Data Interchange), with *DP* automatically converting samples to the *SDII* format it prefers. Sample RAM allowing, you can treat your *DP* recordings with everything your sampler's got to offer, and then just drop them back in your sequence. Supported samplers include the current Akai and Emu families, Kurzweil K2000/K2500 and Roland S760.

MIXING & EFFECTS

In the same way that many editing functions can be applied equally to MIDI or audio data, *DP*'s refined mixer window doesn't discriminate between MIDI and audio tracks. Fader, pan pot, solo and mute buttons are all common to MIDI and audio tracks, and both can access plug-ins. The MIDI plug-ins are a different breed, though, with initially non-destructive effects including delays, transposition, quantise, humanise and, most interestingly, an arpeggiator (if you want to 'fix' an effect, turning it into real MIDI data, you can do so). Audio tracks also have four aux send options, each with a mute button.

The internal audio routing system of *DP* is very flexible: you can have as many audio voices and internal stereo busses as you like, within the limits of your processor and RAM. Alongside MIDI and audio track faders, the mixer can include so-called aux and master faders, which can be set to take audio from the main inputs or any of the internal busses. By routing the outputs of your main audio tracks to internal busses, it is possible to send audio outside the computer (if you have a multi-channel audio card fitted) or create sub-mixes, if you'd like to control multiple tracks with one fader. The movements of the aux and master faders can be fully automated, alongside the main audio and MIDI faders, and they also have access to audio plug-ins.

The automation of mixer functions is rather smooth: simply activate the 'Auto' button, hit Record while you're in the mixing board window, and move any of the controls. Your mix is now recorded (that goes for MIDI as well as audio tracks). Couldn't be easier.

The new plug-in system comes ready-equipped with a solid collection of basic treatments (some available in mono or stereo versions), with plenty of presets to get you started. The initial plug-in collection includes auto pan, chorus, echo, flanger, phaser and reverb. A dynamics plug-in provides compressor, limiter, expander and gate with control envelope, all in one handy window, and there are ▶

IMPROVED PERFORMANCE: MOTU & UPGRADES

If MOTU's move into the native Power Mac audio hardware market with *Digital Performer* was a mild surprise, how about this: the latest version of the company's MIDI-only software — *Performer* v6 — now offers a limited version of the same technology. For the price of the basic sequencer, you'll be able to record eight audio tracks, with full mixing, plug-in and external audio editor support. You lose MOTU's PureDSP routines, and support for sampler and third-party audio cards, but it's still a very affordable and usable way to add basic audio to your sequences. *Performer* v6.0 (£349) also features MIDI plug-in effects, a new 'window sets' feature (which allows you to customise window arrangements and recall them with a key stroke) and new search routines. Search for anything, anywhere, based on any set of criteria you wish. Your selected events appear in the search results window, and you can do whatever you want to them: select them, change them, delete them, scale their velocities and so on.

MOTU just keep upgrading their software. Tweaks, updates and additions have been coming thick and fast over recent months. For example, when I first started to look at *Digital Performer*, it was in v2.1; almost immediately, it became v2.11, and as I finish the review, v2.2 is available in this country, with v2.3 not far behind. MOTU's updates seem mostly to be implementing features asked for by their users, as well as just providing more 'stuff'. Between v2.0 and v2.11, support for the Korg 1212 was provided; v2.2 adds support for crossfades and support for stereo audio files; *DP* can also save split files as stereo interleaved files suitable for use in CD-burning programs.

With v2.3, a new MAS plug-in called *Preamp-1* will be introduced. This acoustic-modelled deviced emulates a "high-fidelity tube preamp"; compression and EQ are built in, and low CPU overhead means you can use plenty of *Preamp-1* without slowing your machine down. Finally, v2.3 of *DP* will also add all the enhancements found in *Performer* v6, plus over 200Mb of free audio samples, featuring percussion, bass, guitar, and effects loops and drones.

An advance look at the MAS plug-in, Preamp-1.

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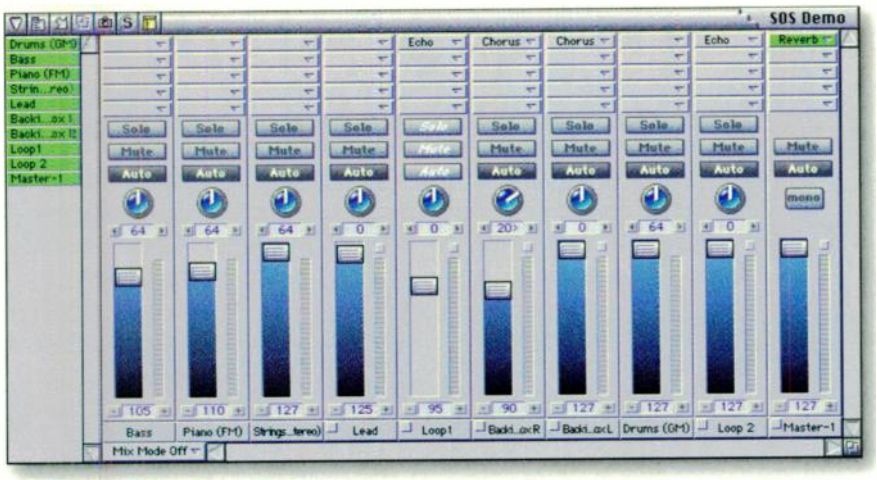
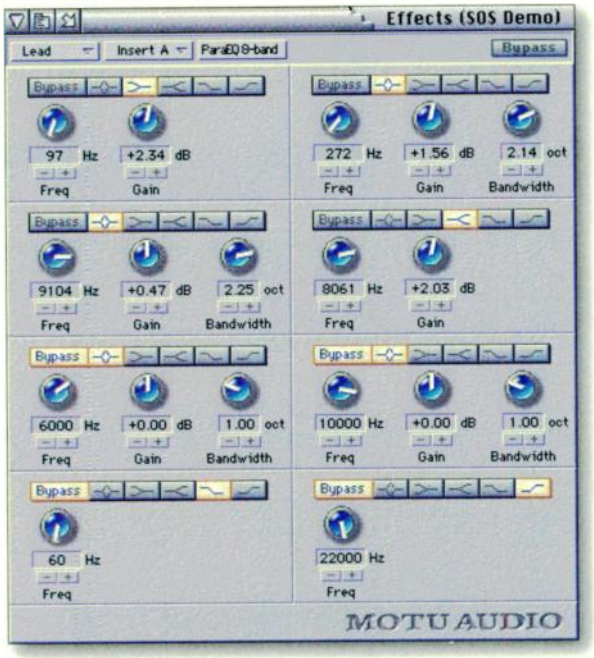


The main Mix window.

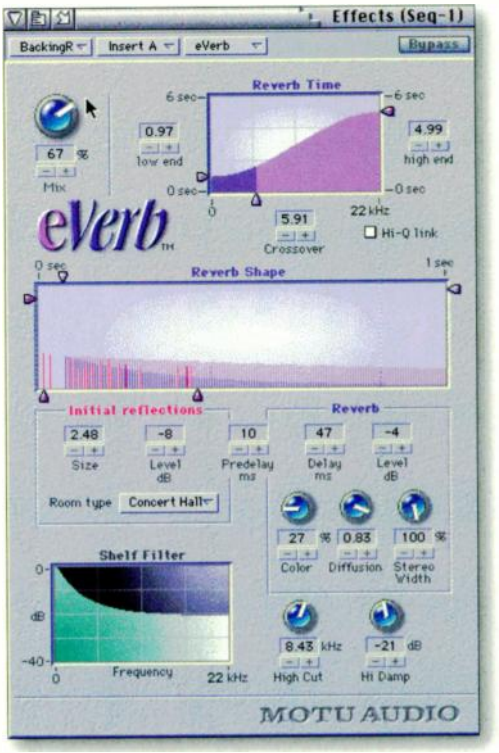


MOTU's generous Parametric EQ plug-in.

▶ several varieties of parametric EQ — 2-band, 4-band or 8-band in mono or stereo — but only activated bands use up processor power.

In addition to the basic reverb that originally came with v2.1, the much more sophisticated *eVerb* was introduced with v2.11. While I wouldn't necessarily change platforms *solely* for this reverb, it really is quite remarkable in its presentation, performance and sound, especially considering that it is essentially free! The display is highly graphic and intuitive, providing plenty of control over your ambience. There are real-time graphic windows for reverb time,

MOTU's splendid new eVerb reverb plug-in.



reverb shape and shelf filter, with individual controls for diffusion, initial reflections, room type and more. Sonically, *eVerb* is on a par with many budget to mid-range hardware studio units, with little of the metallic edge of similar plug-ins.

Quite apart from the MAS plug-ins that come with the software, *DP* can also access any Adobe Premier-compatible plug-ins, though not in real time. TDM plug-ins can be used if you have a TDM system, such as Pro Tools III. The *DP* CD-ROM even includes a demo of sundry DUY plug-ins for you to try out. But be warned that the more plug-ins you use, the more RAM you'll need to get the best out of them, and the harder your computer's CPU will be working.

There is one trick worth bearing in mind if your system is a bit underpowered: audio tracks can be bounced to disk, complete with all levels, pan positions, and effects. Once you've got an idea of where your track is going, you can mix down backing track and harmony vocals, or whatever, to stereo, and reduce the number of voices required to play the audio: 12 tracks of backing vocals bounced to stereo uses just two voices instead of 12, and frees up effects for other tracks. Of course, you don't lose the original audio — you can easily remix the original tracks at a later date.

CONCLUSION

Even before it had Sound Manager support, *Digital Performer* was a pleasure to use. It looks good, and it offers a very user-friendly working environment. Now that MOTU have moved all their sophisticated audio recording and manipulation tools into a system that's not dependent on extra hardware, *Digital Performer* is going to appeal to many potential customers who would not have wanted to, or couldn't afford to, invest in external audio cards. ▶

SYSTEM REQUIREMENTS

If you've checked out all the old MOTU reviews that have appeared in *SOS*, you'll know that an early, 1986, version of *Performer* could run on a 512K Mac! How things have changed.

***Digital Performer* v2.11 will happily run on a pre-PowerPC 68040 Mac with 20Mb of RAM and System 7.1, but without Sound Manager support. If you've got an old computer and a Digidesign TDM system, this is fine. For Sound Manager audio, however, you need a Power Mac, System 7.5 or higher, and Sound Manager itself. MOTU recommend at least 24Mb of RAM, though 32Mb is a better minimum bet, and the more RAM you can afford, the more audio tracks and effects you'll be able to run simultaneously — subject to processor power, of course. Note that if you're using MacOS 8.0 or higher, you'll need even more RAM; use Extensions Manager to create a system with as few extensions as possible. And remember, adding or using plug-ins eats into your RAM and processor overhead, so keep this in mind. And while we're on the subject of performance, a dedicated hard drive for audio is a good idea; a large-ish AV drive needn't be that expensive these days.**

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- Three software generated exponential envelopes
- White noise generator
- 512 programmable patch locations
- All parameters send and receive midi controller info
- CV, Gate & external audio input

WARNING: These synthesizers are true analogue and completely unique and are not to be confused with digital technology used to emulate analogue sounds. Don't be fooled by GENUINE IMITATIONS - GET REAL!

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And the latest version even offers tricks that were missing before, including MOTU's own plug-in system and support for samplers. Is it good value? At £549, it's about average for a serious piece of pro software; you can pay more, for Opcode's *Studio Vision Pro* and high-level versions of Steinberg's *Cubase VST* family, but audio facilities are available with a basic *Cubase VST*, which costs not much more than £300. If you're interested in what *Digital Performer* offers but are already committed to another software platform, contact UK distributor MusicTrack for details of an interesting crossgrade scheme.

Before I finish, I'll have to note that my time with *DP* wasn't all hearts and flowers. For a start, it consistently froze my computer (a 250MHz 6500 with 96Mb of RAM, running MacOS 8.0), necessitating a regular crash and reboot scenario. This frustrating situation remains pretty much unresolved as I write, in spite of the best efforts of MusicTrack and MOTU themselves. Between us, we examined every aspect of the system, eventually booting the Mac from a Zip cartridge with an absolutely minimal system, with almost no extensions save for FreeMIDI and Sound Manager. Still no joy. MOTU say they haven't come across this problem before, and my experience of trying the software on another Mac would seem to confirm that it's a model-specific problem. On an underpowered 80MHz 7100 with a fraction of the memory, the same Zip disk booted fine. Screen redraws were ridiculously slow, and I was eating up 90% of available processor power, but at no time was audio playback compromised. Adding too many effects or trying to play back too much simultaneous audio brought up helpful alerts, but the computer didn't freeze. So my particular problem is definitely *not* a reflection on the software, but is the result of some yet-to-be-diagnosed hardware or system problem with my Mac. In the course of my research I came across one other example of a person with the same 6500 Mac as myself, having the same kind of problems. Interestingly, the 6500 has no problems running *Cubase VST*.

One of the few negative points I could make about *DP* are that it is very processor and memory hungry, but the same goes for all the competition. Your computer is being persuaded to crunch some serious numbers while dealing with real-time digital audio. Secondly, as intuitive as *DP*'s layout is, MOTU have still made one or two odd choices. For example, I can understand MAS setup functions being under the Basics menu, but this is where you find the Performance Monitor window as well; it would feel more comfortable to me if it was part of the Windows menu, where the Audio Monitor is located. And, strangely, aux and master faders have to be set up in the Tracks window; I would have liked an option for choosing them in the main mixing window. Also, if you're crossing over from another platform, you might find *DP* to be operationally eccentric. It's not, though — it's just different. And besides, it has one of the best on-line help systems I've seen: forget the manual and enable Balloon Help! Pointing at any unfamiliar icons will provide a full explanation of its function.

My opinion of *DP* as one of the better examples of MIDI + Audio sequencer is unimpaired, and Sound Manager support has made me like it even better. Not only does it feel as though you get more control over input levels than some of the competition, but the actual audio seems to sound better coming back off disk. I'm quite prepared to find that I'm fooling myself on this last point, though (now, where did I put those oxygen-free cables...?). *Digital Performer*'s user interface remains, as ever, one of the most elegant in the business, with this elegance stretching to audio file handling, plug-in implementation and internal routing. This is one update that was definitely worth the wait. SOS

> "*Digital Performer*'s user interface remains, as ever, one of the most elegant in the business..."

WEBBED FEAT

As essential and informative as the main MOTU web site (www.motu.com) is, any serious user of the company's products avoids the independent MOTU-Mac site at their peril (head for www.zweb.com/qsystems/motumac/). Central to the site is a mailing list which keeps you in touch with hundreds of other users and the latest developments; most useful is the daily digest. The site also features FAQs, user tips, useful files and further links.

info

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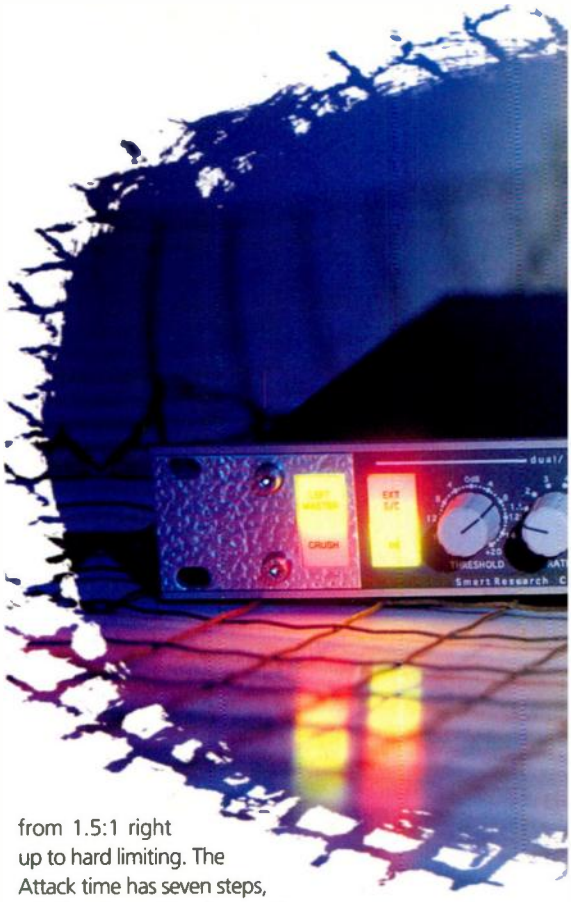
Smart Work

SMART RESEARCH C2 COMPRESSOR

PAUL WHITE finds he has a crush on the Smart Research C2 compressor — but at what cost?

Smart Research are a small British company who, in a very low-key way, have been making inroads into the high-end signal processing market. The company is headed by engineer Alan Smart, who has been in the pro audio industry for 16 years, starting his career as an assistant engineer at Waves studios in London, before becoming an electronics engineer at Digital Audio Systems. Since then he's been involved in a number of prestigious projects, including work for Peter Gabriel, both on tour and in the studio.

The new C2 compressor is distinctive in appearance and is priced in the esoteric league, but at first glance the controls look pretty standard — until you spot the button marked 'Crush', that is! In fact, the original concept for the C2 has been around since 1984, when Alan used the prototype on his own recording sessions at Blue Wave Studios in Barbados, where he was chief engineer.



The current C2 incorporates a number of improvements, and is a 2-channel, 1U-high rackmount compressor that can be used in stereo link mode to treat finished mixes, or used as two independent compressors. 'Crush' mode, which I'll come onto later, can only be selected globally, so either both channels have it or both don't.

Inputs and outputs are on XLRs only, with a further pair of XLRs fitted to provide side-chain access. The side chains may be left permanently connected, as they can be selected via buttons on the front panel.

CONTROLS

As soon as you power up the C2, the front-panel buttons flash in a brief test sequence, which suggests some kind of digital switching rather than the more normal analogue switches that sit directly in the signal path. All six buttons have a short travel and illuminate when active, providing bypass for each channel, side-chain access for each channel, stereo linking, and Crush mode.

Though the compressor timing controls seem fairly standard, they are in fact switched rather than being continually variable, and there's no soft/hard switching or auto attack/release mode. Judging from the graphs supplied, the compressor seems to have a progressive 'knee' which is very soft at low ratios and becomes harder at higher ratio settings. Threshold is continually variable from -20dB to 20dB, while Ratio is adjustable in six steps, from 1.5:1 right up to hard limiting. The Attack time has seven steps, ranging from simply very fast (which is around one third of a millisecond) to 30ms, and Release time is set in six steps, from 100ms to 2.4s. These controls are followed by a variable make-up gain control, offering up to 20dB of additional gain. Metering is via moving coil, non-backlit meters and these always show gain reduction — there's no additional metering or meter-switching to show the output level.

COMPRESS OR CRUSH?

Before a compressor can sound good while compressing, it has to be able to sound good while doing nothing, so the designers have gone to great lengths to make the basic signal path as clean as possible. The circuit frequency response extends from 20Hz to 100kHz, within half a dB, while adding no more than 0.005% distortion (at 1kHz). The output can drive at up to +28dB into a 600Ω load, and if there is a power failure or power supply failure during use, a failsafe relay connects the input directly to the output. Even the side-chain inputs are balanced.

Because a differential pair of very high-quality VCAs has been used (see 'Inside The Box' box for technical details), the designers have at their disposal a low-noise, distortion-cancelling block, and for most applications this is exactly what is required. However, compression can be as much an effect as it is a process, which is where the Crush control comes in. Crush brings in an FET gain-control stage that works in conjunction with the VCA to produce harder compression and progressive distortion at high signal levels, ostensibly to recreate the sound of classic compressors. However, Crush also brightens up the sound in a subtle but noticeable way, by adding a filter with a gently rising response. The effect is a little like the so-called 'air' or 'gloss' controls on some high-end equalisers, and it is quite independent of the amount of compression added. As far as I can ascertain, this

pros & cons

SMART RESEARCH C2 £2227

pros
- Clean, quiet signal path.
- Choice of polite or aggressive compression.
- Simple to set up.
- Crush setting produces some great drum sounds.

cons
- Very expensive.
- Crush setting EQ can't be varied or bypassed.
- No output level metering.

summary
An esoteric and impeccably specified compressor that's just different enough to attract a lot of interest. It's a shame that few project studio owners will be able to afford to consider it.

SOUND ON SOUND

filtering effect is not dynamic — it's a straightforward (but very nice sounding) fixed EQ.

THE EARS HAVE IT

I checked this compressor out with live vocal mics, live acoustic guitar mics and pre-recorded sections of drums, submixes and final mixes, all of which confirmed that it is indeed a very well designed and incredibly quiet compressor. With Crush mode off, modest levels of compression provide near-transparent gain control with no loss of top-end detail, while hard compression invokes a little musically benign pumping at faster release times. The degree of pumping is just enough to add character and energy to a sound when you need it, but it certainly isn't excessive.

Switching in Crush mode makes an immediate difference, both in tonality and in the way the compressor behaves. The amount of gain reduction on signal peaks seems to increase by three or four dBs (at least according to the meters) and the sound takes on what can only be described as a punch or smack. Kick drums really come alive on the Crush setting, as do bass sounds, and if you really pile on the compression hard in this mode, the feed-forward compressor circuit makes cymbals splash and pump just like the old '60s recordings where the cymbals seem to swell in level after they are hit. If you need compression with attitude, look no further than Crush — although, being critical for a moment, I do feel that on a compressor of this price the EQ boost should have been made variable. As it is, if you select Crush you get the EQ boost thrown in, and, nice as it is, it's a hint too much for some sounds, especially if they're quite bright already. I think an auto attack/release mode would have been useful for some applications too, especially mixes that include radical changes in their dynamics.

These minor criticisms aside, the C2 is a technically superb compressor that adds negligible noise, and no distortion, unless you really want it to. It has enough flexibility to be useful on most types of solo and mixed material, it can provide polite gain reduction, or it can exude attitude — it's all up to the user — and because the controls are so simple, setting up is very easy.

SUMMARY

Despite its esoteric price tag, the C2 is different enough from the competition to carve its own niche. The general signal quality is exemplary, and it's great for creative compression effects as well as routine gain-levelling. I have to admit that I'm surprised by some of the omissions, especially the lack of output metering, but there's no denying that this unit sounds good and is easy to use. The Crush mode is tight and hard hitting, but, as mentioned earlier, I feel the associated EQ effects should have been made switchable or variable.

In short, the C2 seems as happy dealing with a full stereo mix as it does a solo vocal or drum track, and because it has such a technically transparent signal path, it should be warmly received in mastering circles, as well as for general studio recording and mixing. If you're in search of something a little special, I recommend you give the C2 a try. SOS

info

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INSIDE THE BOX

Technically the C2 is quite sophisticated, with elaborate high slew-rate, low-distortion input and output stages designed to avoid the noise that occurs with more common designs. The input stage may be used balanced or unbalanced with no gain-change penalty, and the output stages incorporate discrete devices to provide the capability to run into low impedances or long lines. Rear-panel 3-way switches select balanced or unbalanced operation for the output stages, as well as giving the option of ground lift.

Gain control is handled by a differential pair of the latest THATs VCAs, though in Crush mode a further stage of FET gain reduction joins the party. A symmetrical signal path is used throughout, to reduce distortion, and apparently there are no electrolytic capacitors at all in the audio chain.

Four times able

DRAWMER MX40 QUAD GATE

PAUL WHITE examines one of Drawmer's MX budget range of units to see whether corners have been cut, and discovers that some corners have actually been added!

For as many years as I can remember, Drawmer products have been black, sensibly priced and incredibly dependable — that is, until the MX series turned up in the shops. The new MX units are still dependable and still predictable in operation, but feature restyled metallic panels with black screening and a price tag that doesn't seem at all sensible — at least, not from the viewpoint of anyone trying to make a living out of manufacturing them. According to Drawmer, the MX series' low price tags are made possible by using circuit elements drawn from existing Drawmer products and by simplifying the control systems where possible, not by reducing quality. Though the MX units are aimed largely at the home recording market, they are still professional-quality devices. Indeed, if I have a criticism of the new MX40 quad gate, it is that, in one respect at least, it's *too* professional.

A gate spends most of its life connected via the insert points of a console, and I can't think of a single mixing console in the low to mid-price project studio market that doesn't have unbalanced insert points, on TRS jacks wired for unbalanced send and return operation. Yet the MX40 is fitted only with balanced XLRs, which means that the majority of owners will have to make up special unbalancing XLR-to-jack leads to connect it to their systems (full wiring details are provided). Of course, those with truly professional desks who want to add a few low-cost, pro-quality gates to their systems are onto a winner.

OVERVIEW

Drawmer's MX40 is the second processor in the MX series, the first of which was the MX30 gated compressor/limiter, reviewed in *SOS* back in June 1997. The MX40 is a 4-channel gate which features, instead of the familiar Drawmer high- and low-pass side-chain filter controls, a simplified system utilising a single filter-frequency control knob operating a band-pass filter. It also has just a single external key input, so although you can trigger as many gates as you like together, you can't apply independent external triggers to them. However, if no external key is applied you can select external key to make any of the channels trigger at the same time as channel 1 — good for tightening up sloppy sections, providing the tightest player goes through channel 1.

The MX40 has been simplified in one or two other ways: it doesn't have a variable attack control, and the variable range control found on Drawmer's studio-standard DS201 has been replaced on the MX40 by a single button providing either 20dB or 90dB of attenuation when the gate is closed. Indeed, the buttons outweigh the knobs on this model, with each channel sporting six buttons and just three knobs. There's also a Slave link switch between channels 1,2 and 3,4 allowing pairs of gates to be linked for stereo operation. When pairs are linked, the left-hand channel controls govern both channels.

In some ways, then, the MX40 is less than a DS201, but it also includes a function that the DS201 doesn't have: Peak Punch mode. When this is switched in, the leading edges of transient sounds triggering the gate are boosted slightly to give added impact, a little like

the effect you get from lengthening a compressor's attack time to add attack to drum sounds. Again, this is a preset option with no facility for further tweaking, but it's one that really works well, especially when you need to harden up drums.

THE CONTROLS

The channel controls comprise:

- **Threshold:** fully variable.
- **Release:** fully variable.
- **Trigger Frequency:** fully variable between 50Hz and 8kHz. If you don't need the filter, a button is provided to switch it out, and if you need to key from the rear-panel External jack, there's a Trigger Source button for this purpose.
- **Key Listen:** the MX40 also features the Key Listen mode of the DS201, so if you want to hear what the gate side-chain is hearing, all you have to do is press a button. You can also leave Listen mode engaged if you want to use the channel as a band-pass filter rather than a gate — unorthodox, but sometimes useful.
- **Peak Punch:** When the Peak Punch feature is active, as shown by a green status LED, it boosts the first 10ms or so of each signal triggering the gate by around 6dB. The release characteristics of this boost are handled automatically using proprietary circuitry.
- **Range:** switchable from -20dB to -90dB
- **Bypass** button, with red status LED.
- **Slave** switch: slaves the right-hand channel to the left.

The DS201's traffic-light gate metering has been retained, along with some cutesy graphics depicting 'above and below threshold' signals, and overall, the control panel manages to look both clear and sophisticated. Each of the knobs has a pointer fitted to the skirt for accurate alignment, and sensible calibrations are placed around the controls.

On the rear panel, all the audio ins and outs are on balanced XLRs optimised for +4dBu operation, as mentioned earlier, though the unit is also quite happy in -10dBV systems. The key input is unbalanced on a standard jack, and power comes in via an IEC mains connector, not from a wall wart. Converting from 240 to 120V operation is possible, but you have to go inside the unit and move a couple of links — it's not switchable. ▶

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pros & cons

DRAWMER MX40 £347

pros

- Professional performance.
- Excellent Peak Punch feature.
- Surprisingly flexible.
- Very good value.

cons

- Having only balanced ins and outs means the user will have to make up or buy balanced-to-unbalanced leads to use the unit with unbalanced console insert points.

summary

The MX range is a real gift to the quality-conscious project studio owner working to a budget.

SOUND ON SOUND

OPERATION

The first thing you might reasonably ask concerning a gate that has no attack-time control is "Does it click?" While it's possible to make the gate click by setting unreasonably high thresholds on slow-attack sounds, adjusting the threshold to a more sensible setting completely avoids clicking, so I have to assume that a piece of Drawmer's intelligent attack-time control circuitry has found its way into the MX40. Obviously, switching in Peak Punch on non-percussive sounds is a bad idea, but other than that, the operation is as predictable and vice-free as you'd expect from a top-of-the-line Drawmer processor.

Activating Peak Punch on weak drum sounds provides a dramatic increase in definition and punch, so if you do much drum work the MX40 is worth looking at for this feature alone. The fact that it does not offer a variable attack precludes the type of creative effect which slows the attack of a normally percussive sound, such as a piano, but how often do you really want to do that? For all conventional gating jobs, the MX40 does the job professionally and without complexity, though you don't get the ducking mode of the DS201.

Drawmer virtually invented the gate side-chain filter, and their preferred filter topography has always been a separate high and low-pass shelving filter, both of which could be independently varied in frequency. To save both panel space and cost, the MX40 uses a single band-pass filter with a bandwidth of around one octave, so obviously it isn't going to be as precise as the filters on a DS201, but with tests on drum material I found I could still separate out sounds reasonably well. For example, in a complex drum mix, I was able to coax the gate to trigger only on hi-hat and cymbal sounds. Similarly, there's enough flexibility to reduce the likelihood of false gate triggering from microphone spill that's in a different frequency band to the signal being recorded — useful if you've got a banjo and a double bass playing on the same session.

Having a single external key input may seem limiting, but how many times do you run a session where more than one external gate keying source is used? A bonus of this system is that any number of the gates may be synchronised to the same external trigger (useful for gating stereo material from an external key), or you can make any of the gates track channel 1 simply by not plugging in an external key. This latter facility is sometimes useful for polishing up a vocal section where not everybody finishes at the same time. Routing the tightest vocal through channel 1, in effect, cuts off the others at the same time as the channel 1 vocal stops, preventing raggy phrase endings. While this doesn't always sound as natural as a more professional group of singers, it can salvage an awkward situation without being too obvious, especially if you add reverb afterwards.

> "Peak Punch works extremely well on drums..."

SUMMARY

Though the MX40 is a relatively inexpensive unit that provides four channels of frequency-conscious gating, it is also a well designed and professional processor, even down to the fully balanced inputs and outputs. For most routine jobs it will deliver results every bit as good as the more expensive DS201, and it's only when you start to stray away from the more common studio tasks that its abilities will be stretched. In spite of a few small compromises, the inclusion of the Peak Punch feature and the novel external keying arrangement makes this a hugely useful gate that can do some tricks denied its more costly siblings.

Peak Punch works extremely well on drums, bringing about a quite significant improvement to weak or poorly defined sounds, while the very simple control setup makes it easier for even the inexperienced user to get good results on routine material. There's little or no tendency for the gate to retrigger when it shouldn't, the controls do exactly what you expect them to do, and the Drawmer 'traffic lights' gate status readout always lets you know whether the gate is open, closed, or closing.

For the smaller studio needing a few flexible, high-quality gates, the MX40 is ideal, but I also envisage it being used in a number of more serious studios where there may already be a couple of more expensive gates with all the bells and whistles available to handle the trickier jobs. SOS

GATE BASICS

As everyone who has a studio will have discovered, a recording is often accompanied by a degree of unwanted noise. The main purpose of a noise gate is to reduce this noise, by closing down the signal path when the signal falls below a 'threshold' set by the user. Usually you'd set the threshold just above the level of the unwanted noise. When the gate is open, the wanted signal and the noise pass through, with the noise (hopefully) being masked by the signal. When the wanted signal pauses, the gate closes, shutting off the background noise (which you'd otherwise be able to hear quite clearly, with no noise to mask it) at the same time. There are many other uses of gates, too, and if you're unfamiliar with how they work, you might like to check out the following past *SOS* articles, which explain the principles and some of the applications of these important tools:

- Using The Drawmer DS201 Dual Gate: January 1996 (the information in this article is also applicables to other gates).
- Noise Gates Masterclass: July 1993.
- Using The Compressor And Noise Gate: October 1990.
- How it Works — The Noise Gate: October 1988.

Also check out the *SOS* Bookshop for books on recording techniques. Paul White's own book *Recording & Production Techniques for the Recording Musician*, for example, has a chapter devoted to gates and expanders.

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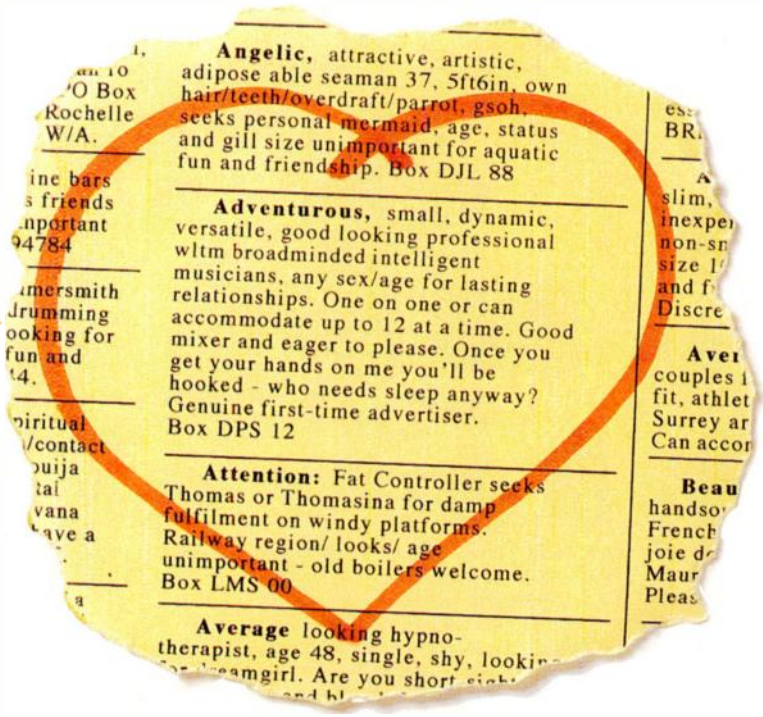

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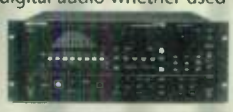

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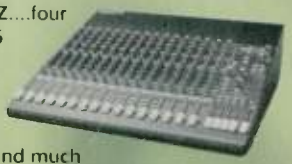

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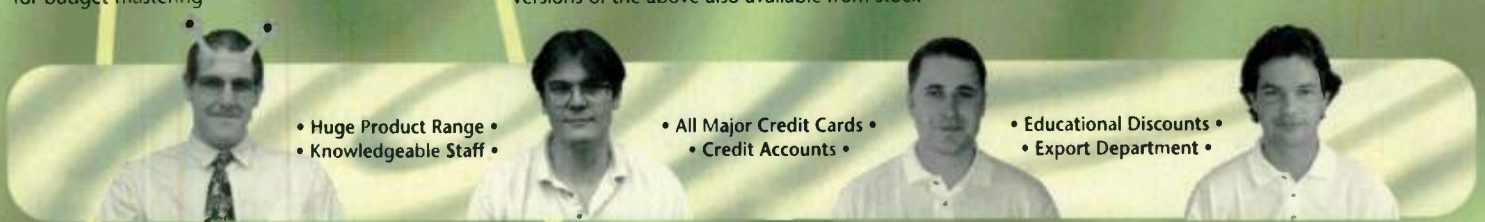

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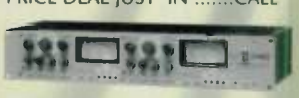

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Spectral Audio's Internet home page includes a large graphic, stating, rather menacingly, 'Rave or Die'. CHRISTOPHER HOLDER meets the new Syntrack monosynth and decides death can wait.

it's a Syn

SPECTRAL AUDIO SYNTRACK ANALOGUE FILTER SYNTHESIZER

Swiss manufacturers Spectral Audio commenced business with the release of the ProTone in the summer of 1996. You may not remember the name, but you'd probably remember its distinctive red, knob-covered appearance. The ProTone was a paradoxical animal unleashed onto a market enamoured with all things bleepy.

Why paradoxical? For starters, it had an external LFO input but no MIDI Out socket or MIDI control over any of the pots; it also had a ring modulator and a self-adjusting MIDI channel selector, but no memory patches whatsoever. With 20/20 hindsight Spectral Audio have decided to forget about the quirky, to do away with any lingering homage to a vintage synth past, and give their latest effort mass appeal. The number of people who enjoy coaxing old unreliable analogue gear into life with days of tedious knob twiddling is limited. People want an analogue-ish sound without all the pitfalls and unreliability of real VCOs (Voltage Controlled Oscillators). People want a digital oscillator, combined with an analogue filter endowed with a suitably plump derriere. People want the Syntrack... or that's the theory, anyway.

If you haven't already cottoned on, the Syntrack is a digital monosynth with an analogue filter. Unlike its predecessor, it has a very tidy MIDI spec and 100 memory locations (expandable to 200, apparently). Under the bonnet are 100 sample waveforms in ROM, and these are all analogue emulations — no bagpipes or marimbas here. No, this is a monosynth that sees the green fertile fields of the dance music scene as its rightful home, where understatement and semi-modular, multi-oscillator flexibility plays second fiddle to easily attainable fat basses and screaming self-oscillating acid squeals. But surely it can't match the raw power of a true all-analogue machine? — he says rhetorically, with enough ambiguity to compel you to hopefully read on...

SWISS ROLE

The Syntrack is a smart-looking blue anodised box, with seven smart-looking plastic pots. The first four knobs on the left control the filter: Cutoff, ranging from 20Hz to 20kHz; Resonance (we all know what that does even if we can't explain it exactly); Env Mod, controlling the modulation intensity of the filter envelope at the cut-off frequency; and Decay, which varies the decay time for the filter envelope (from 0.01 to 2.5 seconds). On the right-hand side of the unit are three controls for the VCA (Voltage Controlled Amplifier). The first pot is switchable between controlling release on the one hand and the decay of the amplitude envelope on the other, effectively adjusting the length of note in two different ways (attack and sustain are fixed); the second pot, Distortion, overdrives the VCA; the third of this set of three is the Volume control, which is self-explanatory. Each of the pots has a green LED above it to show whether that parameter has been tweaked (on for untweaked, off for tweaked), while all illuminated LEDs throb psychedically if you've cajoled a particularly gutsy sustained bass sound out of the Syntrack (the manual advises that this is nothing to worry about).

Six buttons on the left of the unit, in conjunction with a 2-digit LCD display, handle the rest of the unit's operations. The display also registers note on/off data with a single red LED. The only problem with the buttons is that they don't scroll continuously through the values if held down.

The back of the unit hides a socket each for MIDI In, Out, and Thru, an audio out on a quarter-inch ▶

D-90 features..

- 8 track digital multitrack with no compression
- 8 track simultaneous recording / playback
- 44.1 or 48kHz (selectable)
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- ADAT™ Digital Interface (simultaneous 8 channel)
- ±6% pitch control with no loss in audio quality
- MMC & Fostex Exclusive Message for controlling transport from external MIDI device, e.g. sequencer
- Approx. 30 mins recording to 1.3GB drive @ 44.1KHz
- 9 'Virtual reels' ■ Versatile chase mode
- Tempo mapping - create up to 64 tempo & signature changes per song
- Midi clock with song position pointer
- Analogue & Digital I/O (S/P-DIF & ADAT interface)
- SCSI-2 interface option for fast backup of sessions

D-160 features..

- 16 track digital multitrack with no compression
- 8 further 'ghost tracks' for additional takes
- ADAT™ Digital Interface (simultaneous 16 channel)
- ±6% pitch control with no loss in audio quality
- SCSI-2 interface as standard for fast back-up
- 44.1kHz & 48kHz sample frequencies
- Up to 99 'Virtual reels'
- Tempo mapping - create up to 64 tempo & signature changes per song
- Midi clock with song position pointer
- MMC & FEX implemented for external MIDI control
- Copy, paste, move & erase editing with undo & redo
- Analogue & Digital I/O (S/P-DIF & ADAT interface)
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In addition, timecode sync facilities can be added to the D-160 via an optional board.

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balanced jack socket and an identical socket for an external audio input. The Syntrack takes a regular external 9v wall wart power supply.

pros & cons

SPECTRAL AUDIO SYNTRACK £299

pros
- Wild and responsive filter.
- Great bass sounds.
- External audio input.
- Good MIDI spec.
- LFO MIDI sync.

cons
- Limited editing.
- No portamento.

summary

Spectral Audio have built the Syntrack for instant appeal: the bare minimum of controls, a rock-solid digital oscillator, a responsive and extreme filter, and good MIDI spec. It also happens to have some of the fattest and most playable bass sounds around. Well worth auditioning as a perky new voice in your synth rack.

SOUND ON SOUND

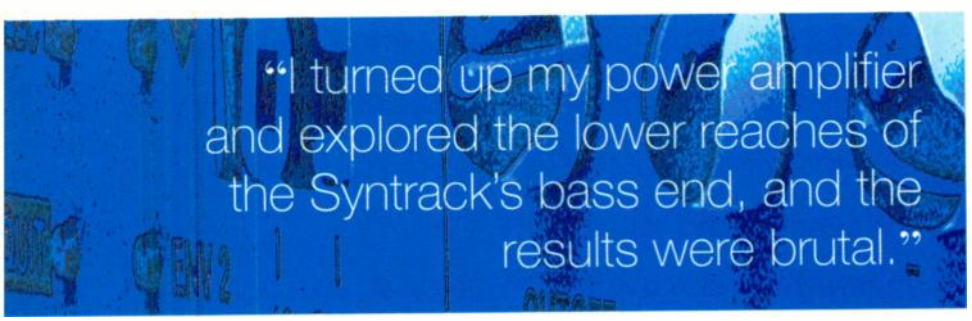
INTERNAL AFFAIRS

Inside, there are 100 digital waveforms awaiting your enjoyment. You'll discover the familiar sawtooth, square and various pulse waveforms, as well as many variations of analogue sounding organs, clavs, ring-modulated waveforms, and clanging FM synth-style timbres. You can scroll through the options and save the results to any of patches 31-99, with the first 30 memory locations being non-volatile. The Syntrack boasts one LFO, which is accessible in the Setup pages and is set globally. LFO frequency is adjustable, as is LFO depth, while LFO Sync locks the LFO to MIDI clock messages sent by your sequencer (fixed to each 8th-note). The LFO modulates the pitch only and is activated from the mod wheel of your controller keyboard (or MIDI controller 1 from your sequencer). Elsewhere in Setup, you have options for incoming note velocities to control filter cutoff or the severity of the distortion, in preference to more conventional volume control. Furthermore, a Retrigger switch toggles on and off to dictate whether the filter envelope is retriggered on overlapped (legato) notes.

As mentioned earlier, the Syntrack's MIDI spec is more than tidy. Every knob you see on the front panel transmits controller messages, and the Syntrack happily recognises those messages when your sequencer plays back that information. A neat addition is the printing of the applicable controller number under each pot — MIDI implementation charts are great fun, but I'd gladly leave them as bedtime reading and have these printed numbers to consult while in the studio!

PASS THE SOURCE

When I first powered up the Syntrack and plumbed it into my studio, I was a little underwhelmed by the results. Tapping away around middle C, I began moving through the 100 presets. Almost without exception each sound had a short decay and little variation — it was like an uninspiring selection of '80s sequence/arpeggiator fodder. At that stage I suspected that it was going to be tough to find any redeeming qualities about the Syntrack, and I knew I'd probably never be let back into Switzerland.



In the Syntrack's manual, Spectral Audio profess to use a wavetable oscillator, but before you get any bright ideas about constantly evolving timbres and endless editing possibilities, I must insert a caveat. The 100 waveforms are definitely in the digital domain, but they appear to exist as samples in ROM. The waveforms have the distinctive buzzing character of something that's been produced by a Wavetable synth like a Waldorf Wave or Microwave (and may indeed have been recorded from such) but it's a bit misleading to present the sound source as a wavetable oscillator. It's almost of some interest to note that if you scroll quickly enough through the internal waveforms while holding a note down, you can actually get something that sounds like a real wavetable patch.

Unfortunately, a lot of the waveforms haven't been stored with the utmost care, and when they're played back you can often hear a clearly audible 'halo' of high-pitched noise around the note before it's gated. This associated noise could be attributed to any number of A/D and D/A conversions in the acquisition and/or playback of the waveform, but it's worth noting that it's there — not on all the waveforms, but on quite a few. On the higher notes the hiss is masked, while if you've assigned the Syntrack to bass duties you can lessen its impact markedly with a judicious bit of high-end cut with your EQ.

PLUMB IN THE DEPTHS

Just when I was beginning to despair that there was nothing to salvage from this review I turned up my power amplifier and explored the lower reaches of the Syntrack's bass end, and the results were brutal. The Syntrack does indeed have a bottom end to fall in love with.

Syntrack call their analogue filter a 'Moog' filter. This is a little vague, to say the least. Moog filters were invariably four-pole (24dB per octave) and the revered Minimoog is often credited with the fattest bass sounds in Christendom. Whatever its exact specifications, the Spectral Audio filter has much to commend it — the sound it can produce when provoked is immense. A great bass sound should have character and unlimited bass-end welly, and the Syntrack is able to produce these timbres seemingly on tap. It has a brilliantly quick attack, which gives the basses a fantastic snappiness. In fact, such is the response that, without much thought, you can DIY a kick drum that will rival a TR909 or 808 for thudding impact — grist for your sampling mill. Virtually all of the 100 presets have a great bass end, and even the sounds with heavy resonance maintain a solid low-end integrity.

SWISS CHEESE

In truth, the sounds you can achieve further up the keyboard aren't necessarily as bland as the presets would suggest. Give the sound a bit of decay and with some work you'll find an interesting lead line. The resonance on the Syntrack is capable of being driven into self-oscillation, and that, coupled with the analogue distortion control, will give you a selection of interesting and chirpy incidental acid sounds. But remember that ultimately you're limited by having

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Free Consultation:

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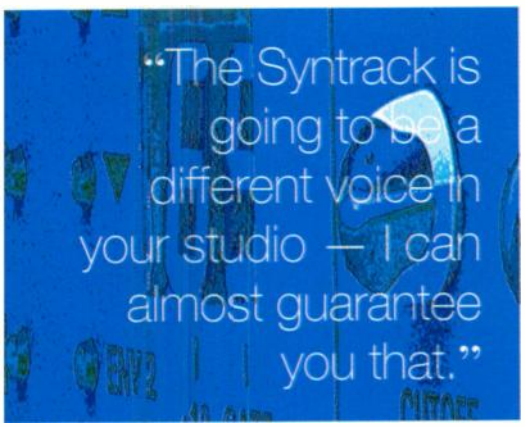
only one oscillator, and the nature of the Syntrack's filter gives the high end quite a bit of transparency, so don't expect any ultra-dense screaming lead lines.

The Syntrack's upper register exalts in its cheesy, '60s, battery-powered organ sounds, and for me this is nothing to be ashamed of. With the resurgence of tacky film-score textures in trip hop, and ravers trading in their plimsolls for slip-ons at 'lounge-core' nights, a good range of organ-like sounds will be as essential as your velvet tux. The principal catch is that, since the Syntrack is monophonic, you can't play chords, but with a little help from your sampler you'll be ready for that Marv and the Magi-tones audition.



As the Syntrack's filter is so responsive, you might find the external input more useful than you'd think. Amongst other things, I routed my Novation BassStation through the Syntrack, with some interesting results. Switch the Syntrack to a blank patch and have the external source triggering the filter via MIDI to call its filter into service. Turn the resonance on the Syntrack past the 12 o'clock position and it's transformed into an intergalactic star destroyer, firing photon torpedoes. This again underlines the point that you'll probably find plenty more *useful* monosynths, but for the money you'll be hard pressed to find anything more enjoyable.

MONO MAGIC

The Syntrack is going to be a different voice in your studio — I can almost guarantee you that. When you reach out and give those cute little knobs a tweak, you get results. The sound is transformed — and you can record the tweaks into your sequencer.

I wouldn't buy this synth under the impression that you'll be coming up with killer TB303-style acid lines (after all, portamento is conspicous by its absence). This is not the Syntrack's bag. It's not a programmer's synth either — the pared-down editability doesn't allow for real complexity. The Syntrack is more about cheap thrills than exploring a new sonic universe, and there's nothing wrong with that. The filter at times gives the upper echelons of the keyboard rather too shrill a quality for my liking, but the glorious by-product of this is that the midrange and low end is to die for.

For a single-oscillator synth the Syntrack has way more guts than it has any right to have. Add some Spectral VCA distortion to the sound and you've entered instant big-beat and techno heaven. Stack it up against the other monosynth candidates at your local dealer for a comparison. I think you'll be pleasantly surprised. SOS

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Power Points

MIDI, AUDIO & PC PLUG-INS

There are now several PC MIDI + Audio sequencers available that provide real-time EQ and effects via plug-in software — but it can be difficult to assess just what works with what, and whether your PC is powerful enough to run the plug-ins you'd like to use. MARTIN WALKER investigates.

Many musicians are now using the latest versions of the big three MIDI + Audio sequencers for the PC (Cakewalk Music Systems *Cakewalk Pro Audio*, Steinberg *Cubase VST* and Emagic *Logic Audio*), but there remains a lot of confusion as to what hardware each supports and just how much PC power is needed to run typical setups with plug-ins in real time. When you try to run a sequence containing both MIDI and audio, using real-time effect plug-ins, your PC is being called on to do an awful lot at once. Not everything is compatible with everything else, and if you attempt to add some of the more esoteric mastering plug-ins (enhancers and high-end reverbs in particular) you may find that your music judders to an intermittent halt. In addition, new soundcards are being released every month, and though some specifically support one or more of the major sequencers, others promise future support, and some combinations are unlikely to ever see the light of day, due to various political machinations.

With all this going on, it's no wonder that many people are cautious about investing in plug-ins, especially as they can often cost more than the sequencer they support. Fortunately, third-party developers have already spotted the gap in the market for audio plug-ins that sound good but don't hog all of the computer's power (I've managed to get hold of a couple of the new ones for review here), so let's look at the current situation to see just what works with what, and what sort of PC you need to do it. ▶

It's amazing how many effects can be crammed into a DMSS-compatible application like Cubase VST. Up to four different effects can be used for input channels, and four more as Master effects.

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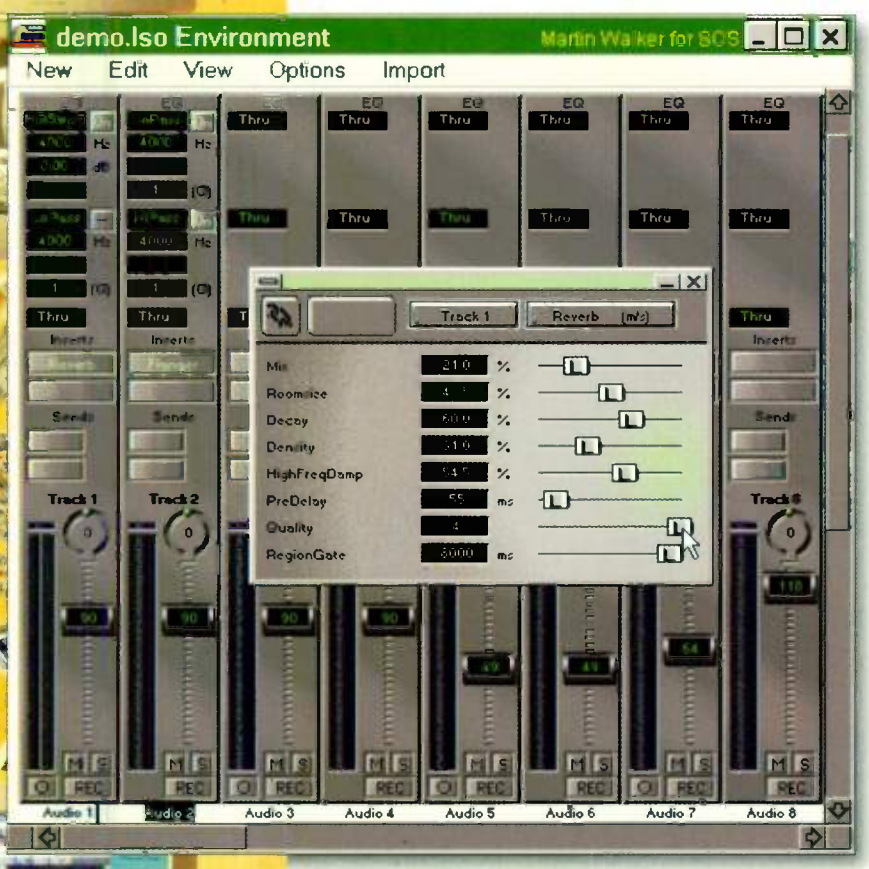
HARDWARE SUPPORT

At the time of writing, *Cubase VST* for Windows is at version 3.502, *Cakewalk Pro Audio* stands at 6.01, and Emagic have just released a major update to *Logic Audio* 3.0.6, which brings it more into line with the real-time effect possibilities of its rivals. All three can run with any soundcard that provides standard Windows 95 Multimedia drivers, but this can sometimes result in limitations, as we shall see later. The ideal solution is to use drivers that interface directly between a specific sequencer and a specific soundcard, so that the code can be streamlined. Here we get into murkier waters, and although much progress is being made behind the scenes, it's not advisable to buy an exotic soundcard unless the appropriate driver is already available.

Normally, it seems to be up to the soundcard manufacturer to write these application-specific drivers, using information made available by the sequencer manufacturer. However, when certain manufacturers make both soundcards and sequencers, there may be a conflict of interest. A classic case is Emagic, whose Audiowerk 8 card has a great spec, and would seem ideal for partnering with any multi-channel application. However, although *Logic* drivers were made available for this card very quickly, drivers to allow the Audiowerk 8 to be completely integrated with *Cubase* and *Cakewalk* have been very slow in arriving. Only a Beta-version Multimedia driver is available even now, and this only lets you use a single stereo in/out (and S/PDIF I/O) from the card's eight hardware outputs. Musicians who already use *Logic* are obviously more inclined to buy an Audiowerk 8 card, but I doubt that long-term *Cubase* or *Cakewalk* users are likely to swap to *Logic Audio* just so that they can use the Audiowerk 8 card. The availability of drivers has become an important issue.



The new-look Logic Audio 3.0, showing the mixer and Mono In/Stereo Out Reverb page.

EXTERNAL EFFECTS

If you're running a computer-based studio with the bulk of the EQ and effects happening totally within the digital domain, any hardware help that can be provided will greatly ease the burden on the PC's main processor. Most soundcards provide onboard DSP power (although only a few use this for high-quality effects), but another option for soundcard owners is to add an external effects unit via the soundcard's digital I/O sockets. Even with a single stereo digital channel, you could configure this as two mono sends and a single stereo return. Since many modern effects units provide a selection of algorithms that use that very configuration, this would seem to be an ideal way to add quality effects. The fly in the ointment is that few effects processors in the affordable category come with built-in digital I/O, although I suspect that this will start to change as more people move towards all-digital setups. Units that do provide digital I/O as standard include the Alesis Quadraverb 2 (reviewed *SOS* October 1994) and the Sony DPS V77 (reviewed *SOS* September 1996). Others, such as the Digitech Studio 400 (reviewed *SOS* October 1996) and Lexicon PCM90 (reviewed *SOS* May 1996), offer digital I/O as expansion options.

THE BIG THREE

The PC version of *Cubase VST* 3.5 was shipped with Multimedia ASIO (Audio Stream Input and Output) drivers. These allow any soundcard which has Windows 95 drivers to be used with it; most multi-channel cards using Windows 95 drivers (apart from Audiowerk 8) appear to Windows 95 as a number of stereo pairs, each with a different driver entry. This allows you to access any of the multiple inputs and outputs available. On the PC, card-specific ASIO support is rather slower off the mark, although apparently good progress has been made with the Korg 1212 and the Event Darla and Gina drivers (currently at the initial Alpha stage); Digidesign are also developing an Audiomedia III card driver for *VST*. A file called 'Troubleshooting.txt' on the *VST* CD-ROM indicates the best settings for a wide variety of soundcards using the Multimedia ASIO driver, including the Creative Labs AWE series, DAL CardD+, Event Gina and Darla, Hohner-Midia Arc 44, Terratec EWS64 XL, and Turtle Beach Fiji and Pinnacle. More specialised hardware, such as the Akai DR8/DR16, Yamaha CBX-D5 and Digidesign Session 8 (previously catered for by *Cubase XT*) is no longer supported, as integrated EQ and effects cannot be provided when simply remotely controlling other hardware.

Cakewalk Pro Audio 6.01 allows various specific hardware options. Apart from, again, supporting all soundcards which have standard Windows 95 Multimedia drivers, it also directly supports the Digidesign Session 8 and Audiomedia III cards and Digidesign's EQ plug-ins, although

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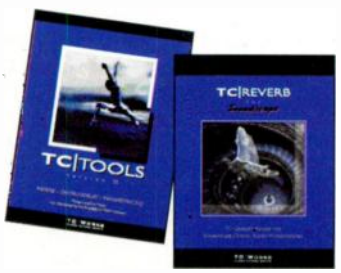

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these can only be used as inserts, and not via effects loops. DAL's V8 system (and the V8 custom plug-ins, which include a special version of Waves' *Native Power Pack*) is also supported, and in this case the effects can be used as either single-channel inserts, or in the aux send/return system. Finally, Soundscape's SSHDR1 is supported at the recording/playback level, although none of its internal effects can currently be accessed.

The most recent package of the three I'm talking about is *Logic Audio* 3.0, which has only been shipping for a few weeks. It supports Multimedia cards in the same way as the other two, but also has specific support for the Digidesign Audiomedia III, Audiowerk 8 (of course), and Soundscape's SSHDR1, subject to similar limitations as the other sequencers. *Logic* is a special case — not only are the real-time plug-ins supplied with the sequencer proprietary (like the in-built *VST* ones), but there is also currently no way to add DirectX plug-ins at all. Since DirectX seems to be the emerging standard, I asked Emagic what their future plans were. Their response was: "In the very near future Emagic will release new versions of its *Logic Audio* system that will include support for other plug-in formats". That sounds to me as if DirectX is on the cards. Keep your fingers crossed.

BUNDLED EFFECTS

With all three packages, a selection of bundled effects is provided. To give you an idea of their scope and the power on offer, I listened to all of them, as well as measuring (as far as possible) the typical processor overhead running in *Cubase VST*. This figure gives you an idea of what proportion of your overall power is being used. I used a PC fitted with a Pentium 166MHz MMX processor, but to calculate the equivalent overhead used by a different speed of processor, you simply multiply or divide accordingly (for example, if the result is 5% for the 166MHz processor, a 200MHz processor would take 166/200 as much, or about 4%).

Interestingly, the *VST* effect overhead appears when you click on the *VST* Effects Power switches, and doesn't increase significantly when further channels are added to the effects mix buss — the effect takes far more processor power than simply mixing the audio at its input. For this reason, if you're running close to the limit it's worth remembering that using a different amount of reverb send on every channel, to the same reverb plug-in, will take a lot less overhead than attempting to run several different ones, each patched to a different channel.

> "...it's not advisable to buy an exotic soundcard unless the appropriate driver is already available... and it's up to the soundcard manufacturer to write these..."

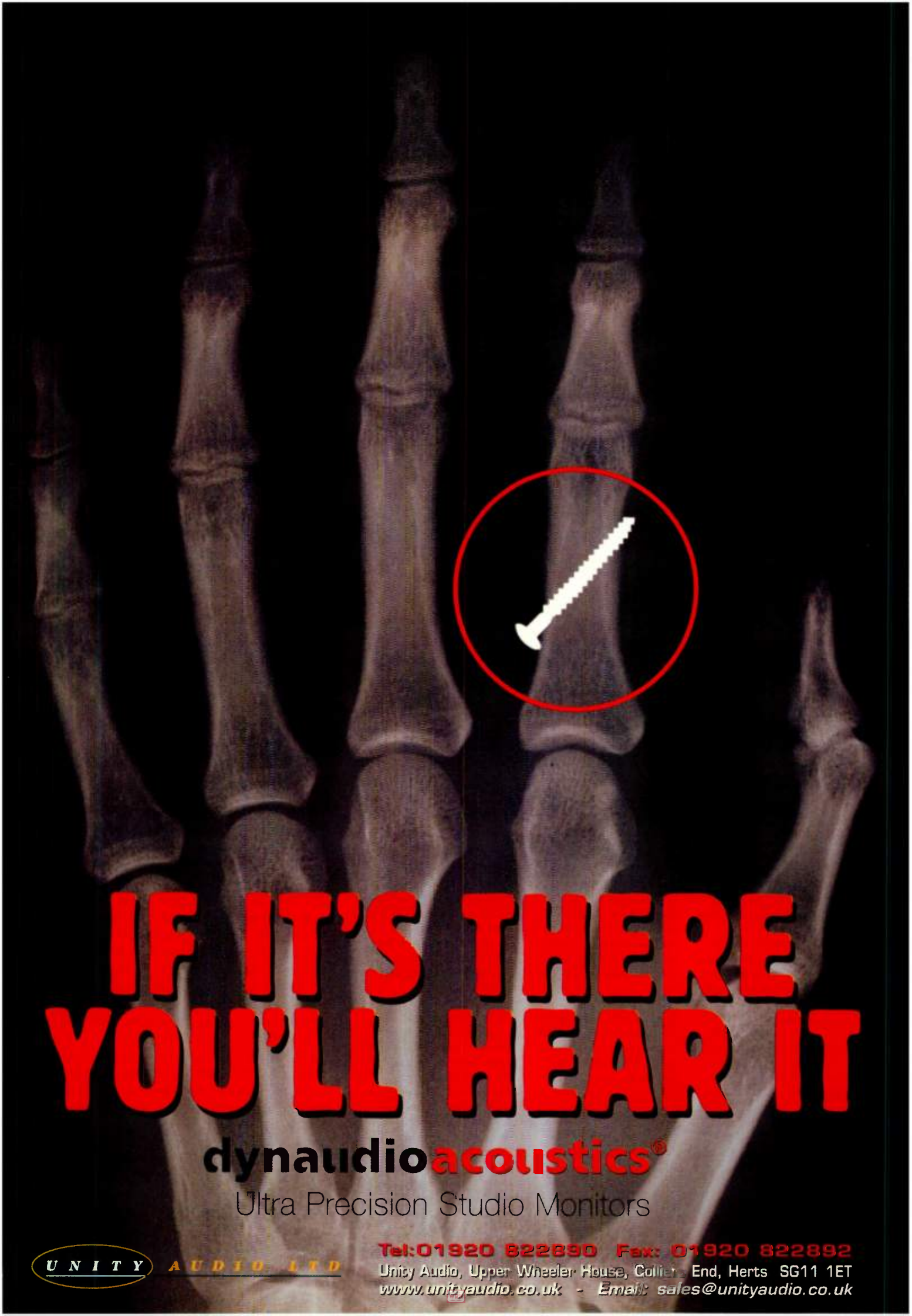
Cubase VST is supplied with six Mixer Effects (Mono in/Stereo out). Not surprisingly, the AutoPan requires least power (3%), since it is only moving audio between the speakers, rather than modifying the actual waveforms. StereoEcho only takes 3.5%, for similar reasons; FuzzBox takes 4%; Wunderverb 3 is a basic reverb with three controls (Size, Decay and Damp) which works surprisingly well considering that it only needs 6% of the processor's power. It can provide some wonderful metallic tube effects and some reasonable room reverb sounds, but tends to always have a metallic edge to its decay, which makes it difficult to recommend as a main reverb. Both Espacial (ambience and room FX) and Choirus (Chorus and Flanger) take 8%. Espacial provides more early-reflection controls than Wunderverb, but still sounds metallic. It's advisable to turn the speaker levels down a bit when fiddling with both Wunderverb and Espacial parameters,

DIRECTX PLUG-IN OVERHEADS

To give you an idea of how many plug-ins you're likely to be able to use, I did some testing. First, I ran a single channel of audio in *Cubase VST* 3.502. Having measured the percentage of total processor power used (overhead) when running this channel with no effects at all, I then systematically added effects, and measured the increase shown in the *Cubase VST* Performance CPU meter (achieving more accurate figures by averaging the result of running several simultaneously). The figures below were arrived at using a Pentium 166 MMX and show the extra overhead taken by each effect (after subtracting the proportion taken by the audio playback alone). Remember that this overhead is for switching on the effect — multiple channels can access a single reverb, seemingly without significantly affecting overhead. In the case of effects whose overhead varies depending on how you set it up, results are for the default settings.

PLUG-IN:	OVERHEAD
CMS *CAKEWALK*	
Time-Stretch/Pitch Shift	4%
Chorus	5.5%
Delay/Echo	6%
Flanger	6.5%
2-band EQ	8%
Reverb	17%
QTOOLS	
QSys/AX (wide panner)	8%
QXpander* (width expander)	11%
Q123/AX (mono to 3D)	18.5%
SONIC FOUNDRY *XFX 1*	
Simple Delay	6.5%
Multi-tap Delay	14%
Chorus (3-stage)	29%
Reverb	31%
Pitch-Shift	35%
Time Compress/Expand	16%
STEINBERG *CUBASE VST*	
Built-in EQ	less than 2%
AutoPan	3%
StereoEcho	3.5%
FuzzBox	4%
Wunderverb 3	6%
Espacial!	8%
Choirus	8%
Grungeliser	22%
Spectraliser*	80%
TC WORKS	
Native Reverb	44%
Native Reverb VST	42%
WAVES	
S1 Stereo Imager*	10%
C1 Gate	10.5%
C1 Compressor	15%
L1 Ultramaximiser*	20%
Q10 Parametric EQ	30%
Trueverb	72%

NB: The plug-ins marked with a * were used as Master effects.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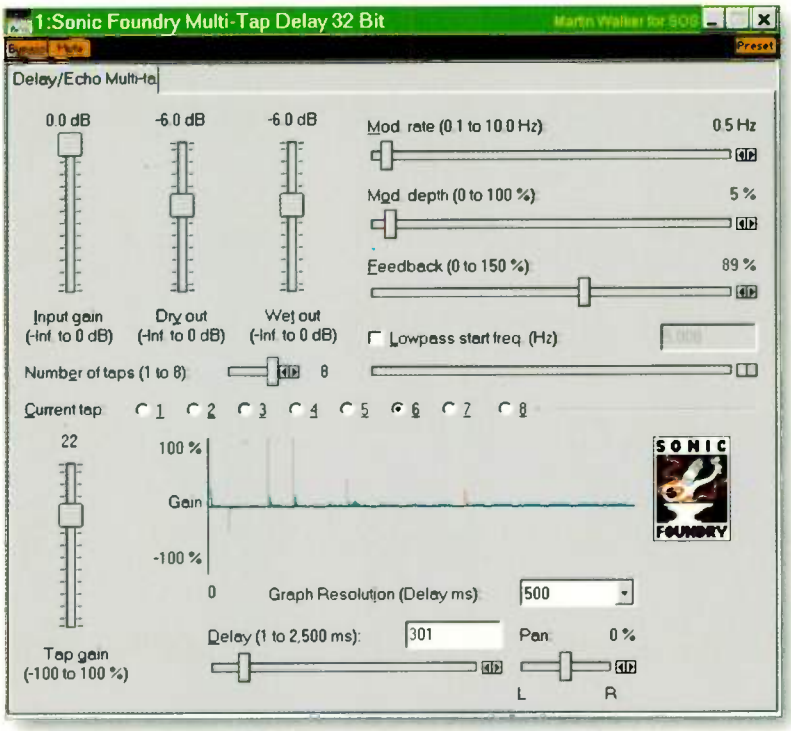

The Sonic Foundry Multi-Tap Delay (one of the range of six plug-ins provided with the XFX 1 pack) is capable of providing a huge range of delay cluster effects.

▶ since it is possible to come up with settings that cause loud 'cracks' and break-up.

Overall, the *Cubase VST* bundled effects are extremely useful, and my comments on the two reverbs should be taken bearing in mind that the excellent Waves' *Trueverb* needs a mammoth 72% of processor power measured in the same way. Of the two, Wunderverb 3 can sound surprisingly good with many sources; it's only when it's called on to act as a vocal or drum reverb that the limitations become obvious — something you could also say of many budget hardware effect units.

Cakewalk Pro Audio 6 comes with bundled DMSS effects (including 2-band EQ), and once again I used *Cubase VST* as a comparative engine to test these. The CFX 2-band EQ is the only one that you can use in real-time with *Cakewalk Pro Audio* 6 — you can process audio with more advanced options, such as parametric EQ, but only off-line. The CFX Delay/Echo takes 6%, and provides a wide variety of treatments. The CFX Reverb takes 17%, but despite the fact that it has more than double the overhead of either of the *Cubase* reverbs (partly due, no doubt, to the fact that it is DMSS compatible, rather than tied uniquely to its own program), the sound quality isn't significantly better. Switchable early-reflection settings are provided (None, Sparse or Dense), as well as a high-pass and low-pass filter, and its basic character is clean, but the ends of the reverb tails are very lumpy. The Chorus and Flanger effects are good, though. So, overall, *Cakewalk* owners have a good range of effects to get them started.

Unfortunately, *Logic Audio* 3.0 finally arrived just a day before this feature was finished, so only a very brief audition was possible, but *SOS* has reviewed the equivalent Mac version in full (see the January 1998 issue), and there will be a separate look at this PC version soon. In the short time I had to listen to the built-in effects, my favourite was the Reverb: with eight tweakable parameters, including Room Size, Decay, Density, High-Frequency Damping, and Pre Delay, this provides a wide range of sounds, although there always seems to be a slightly metallic edge at the end of longer decays. The Quality option offers four settings, from lumpy to smooth, and allows you to decide on the balance between quality and processor overhead. At the highest setting, the *Logic* reverb gives a much smoother sound than either the *Cubase* or *Cakewalk* reverbs, but it does seem to take about 40% overhead. However, the final reverb parameter is Region Gate, and this is a clever way to minimise that processor overhead — you can set a time ▶

IT'S ON THE CARDS

Hardware support is a major issue, since so many recent multi-channel soundcards have on-board DSP chips, with enough processing power to provide additional real-time EQ and effects, to help the main CPU. It should be possible for any soundcard manufacturer to provide a stand-alone utility to allow you to change EQ and effect settings for each channel of a particular soundcard. However, this seems to be a rare option, and often the only way to access any of these special features is via a purpose-designed hard disk recording program. This may come bundled 'free' with the hardware, or it may be a separate purchase. However, to add support for MIDI you need to run a separate MIDI sequencer, with the added complication of syncing the two packages together (as well as swapping between the two screen displays on a regular basis).

The beauty of using hardware DSP is that your PC can run more tracks and extra plug-ins, since a significant amount of the processing is being taken care of by the soundcard. For *Cubase* users, I suspect that a popular solution will be the forthcoming Lexicon Studio system (due in March 1988), which integrates *Cubase VST* with a multi-channel PCI soundcard and a special version of the famous PCM90 reverb. Unfortunately, soundcard DSP is always proprietary, so different code will be needed to run plug-ins on the DAL V8 card (reviewed in this issue), Ensoniq Paris (reviewed *SOS* January 1998), and so on — you can't run DMSS plug-ins using the soundcard.

Even cheaper modern cards such as the Event Gina (reviewed in the December 1997 *SOS*) have sufficient DSP power to hold out the carrot that future driver updates should be able to allow plug-ins to run directly using some of this DSP power, rather than the main computer processor. Indeed, the ultimate plan is to produce an ASIO driver that supports *VST* processing directly on the Gina's DSP.

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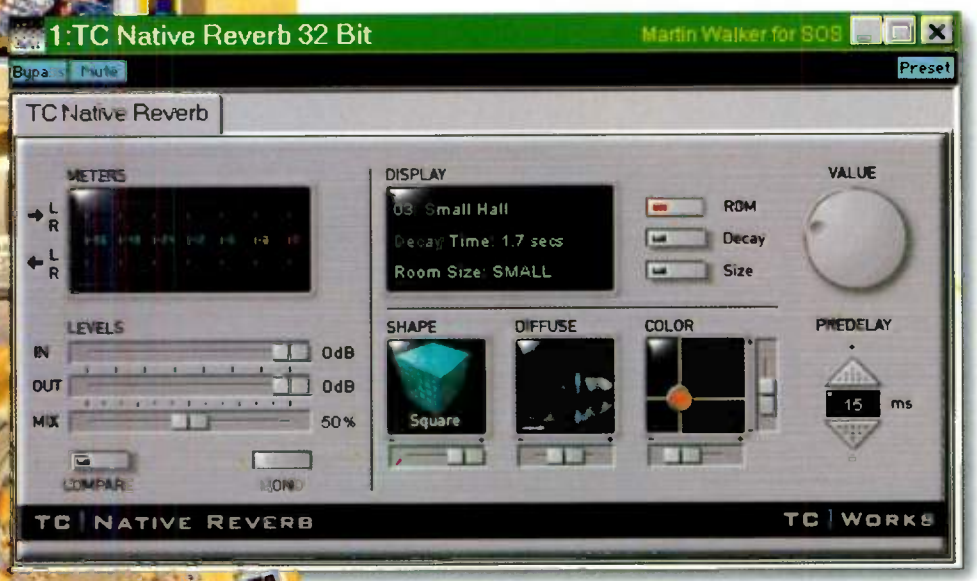
between 0 and 25 seconds beyond the audio region, after which the effect is completely cut, so that it takes no further overhead until you need it again. Setting it slightly longer than the reverb decay ensures that the effect is switched off when no sounds are present.

SONIC FOUNDRY *XFX 1* PLUG-INS

Although quite a few plug-in packs are available for mastering purposes (de-clicking, spectral enhancement, noise reduction), many people will be looking for additional general-purpose ones to swell their effects arsenal. One of the first manufacturers off the blocks is Sonic Foundry, with the *XFX 1* pack. This consists of enhanced real-time versions of a group of effects that were only previously available within the *Sound Forge* software. Because they have been re-jigged to be DirectX compatible, they can now be used inside *Cubase VST* or *Cakewalk Pro Audio*, as well as with *Wavelab* and *Sound Forge* itself.

The Simple Delay provides echoes from 1ms to 5 seconds, and has feedback and decay controls for slapback, follow-on echoes, and resonant tails. The MultiTap Delay gives you between one and eight taps, each of which can be set between 1ms and 2.5 seconds, plus parameters for global modulation rate, depth, and feedback, with an adjustable low-pass filter. There's also a graph showing the delays, which makes life a lot easier, and it's possible to set up complex treatments fairly quickly.

"DirectX seems to be the emerging standard..."



TC Works' Native Reverb sounds as good as it looks, and the user interface is very responsive, allowing you to get the exact sound you want with a minimum of fuss.

The Chorus effect provides initial delay, mod rate, depth and feedback, a low-pass filter and feedback, and options to invert the chorus or feedback phase. The chorus size can also be adjusted from one to three stages, which determines the number of times the signal is processed through the chorus algorithm. Although you can get some richer sounds from this than you can from the built-in Choirus plug-in already included with *Cubase VST*, no stereo spreading is provided (a mono channel in seems to result in a mono channel out), so the overall effect is somewhat diminished compared to Choirus.

The Reverb provides a wide range of settings, with 19 modes ranging from subtle ambiences, through a variety of rooms, halls and a cathedral, to more off-the-wall spaces such as corridors and metal tanks. There are 10 early reflection styles, plus controls for pre-delay and decay time, and fully adjustable high- and low-pass filters. A wide range of sounds is available, but they do sound a bit lumpy and grainy with more critical sources such as drums and vocals. Also, strangely, although the early reflections are capable of being spread really wide, the distant reverb is always fairly narrow — suitable for adding effects, but not as good for wrapping an acoustic around a mix.

The final two plug-ins provided in this package are Pitch-Shift and Time Compress/Expand. Both of these provide useful effects, but shifted audio suffers, as audio does with most similar algorithms, when moved a long way from its original pitch or speed.

One small disappointment is that the large selection of presets that appear when these plug-ins are run from *Sound Forge* does not seem available from within any other package (this was also the case with Waves' *Native Power Pack* until the latest update). Sonic Foundry say that this will be fixed in a free update likely to become available in January.

Taken as a batch of plug-ins, the *XFX 1* pack is good value. The most useful individual plug-ins are the MultiTap Delay and the Reverb. The latter is significantly better than the built-in ones within *Cubase*, but it still isn't really of high enough quality to use as a main reverb for drums and vocals.

The next pack in the series (*XFX 2*) is due to be released early in 1998, and again features plug-ins previously only available within *Sound Forge*. These will include Noise Gate, Graphic Dynamics, Multi-Band Dynamics, Paragraphic EQ, Parametric EQ, and Graphic EQ.

TC WORKS *TC NATIVE REVERB*

The *TC Native Reverb* is the first in a new series of plug-ins from TC Works, a new company formed by TC Electronics which will concentrate on computer-based audio workstations, on both Mac and PC platforms. TC Electronics already have an enviable reputation for their DSP technology, used in products such as the Finaliser (reviewed in December 1996), and the M2000 digital effects processor (reviewed in August 1996). All this augurs well for their first reverb plug-in; you can download a free demo (with every control locked to a single preset value) direct from the TC Works website if you want to see for yourself. TC Works distribution is being handled in the UK by Arbiter ▶

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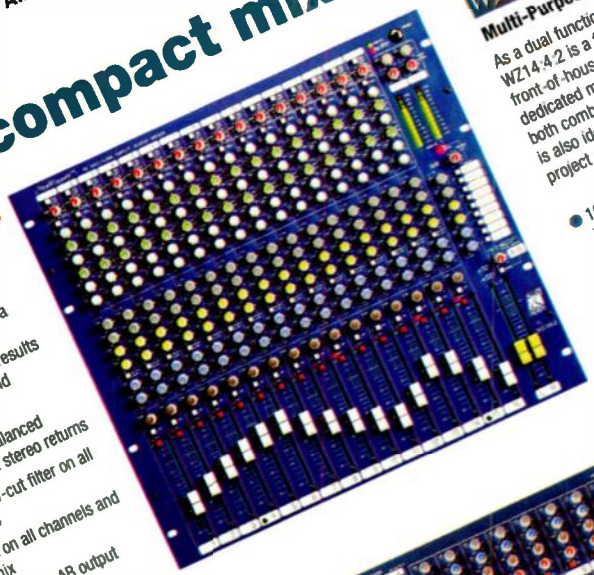

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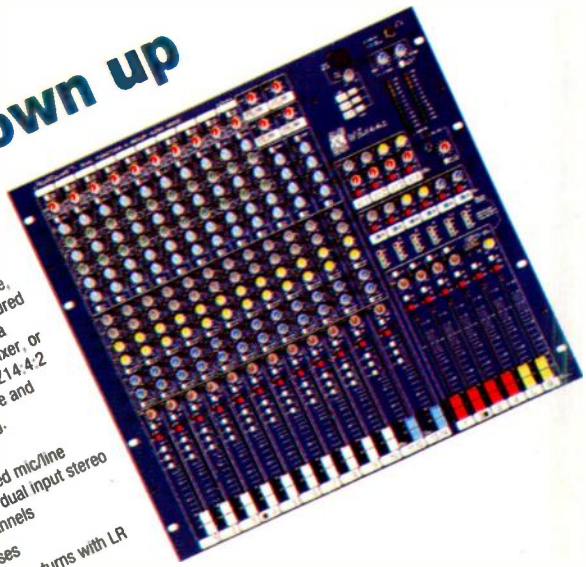

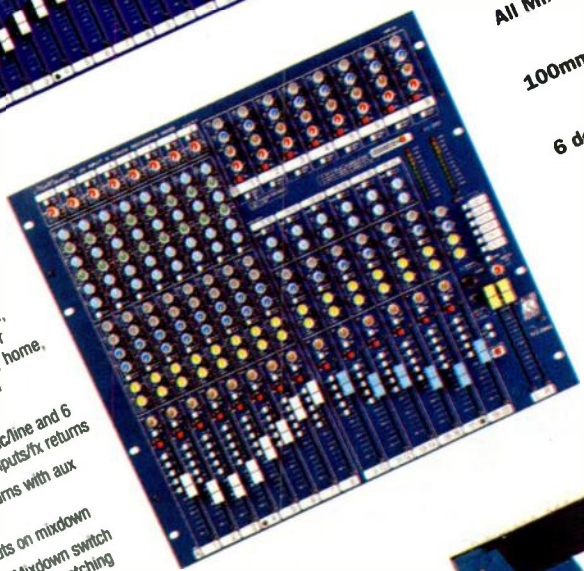

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▶ Pro Audio, who also handle the Steinberg range.

Installation is simple, but one departure from the norm is that if *Cubase VST* is detected on your PC, two extra versions of the plug-in are installed for *VST* channel and master duties, as well as the more general DirectX one (the *VST* channel version doesn't need a mix control, and so takes slightly less processor overhead).

My initial impressions were good: the *TC Native Reverb* has a very smart graphical interface, which presents every parameter in a single, easy-to-use window. There are two meters, indicating Reverb send level (adjusted by an 'In' slider), and combined Direct/Reverb output level (adjusted by an 'Out' slider). There's also a third slider, labelled 'Mix', which adjusts between full dry (0%) and full wet (100%) mix (this is blanked out in the *VST* channel version). The other half of the window hosts an extremely clever interface which, although being easy to use, provides a huge range of control options.

The display window shows the settings of the current 'ROM' preset (10 available), Decay Time (from 0.1 to 20 seconds), and Room Size (nine settings, ranging from Box, through Medium, to Huge, and including a Spring setting, which alters the scaling of the early reflection patterns). You can select each of these by clicking on the appropriate switch, and once a switch has been selected, you use the large Value dial alongside to alter its value, by clicking on its pointer and dragging the mouse up or down. I found this a bit fiddly, and there seems to be no reason why the whole dial should not be 'active' for initial grabbing, rather than the much smaller pointer. It's actually far easier to left- or right-click within the display window to increment or decrement values.

There are four more graphic controls beneath the Display.

- **Shape** (Square, Curved, or Round) affects the early reflection patterns. Most of the presets use the Square shape, but the Cathedral uses the Round one, and both the Church and the Tiny Box use Curved.
- **Diffuse** affects the level of 'liveliness' of the walls of the virtual room, by adjusting the density of reflections in the reverb decay.
- **Color** is a two-way control which seems to control high-frequency damping and EQ from top to bottom, and low-frequency damping and EQ from left to right.
- **Pre-Delay** shifts the reverb timing relative to the direct signal, and this is proportionally linked to the Room Size button, so that whatever pre-delay you select will be scaled up and down according to the chosen room size.

The Sony DPS V77 is just one of a number of effects processors that provide full digital I/O, so that you can preserve your digital path when adding external effects.

Soundwise, the *TC Native Reverb* certainly lives up to expectations, and the 10 presets offer a wide range of room types. Reverb tails are extremely smooth, wide and deep, and have no obvious coloration as they decay (unless you use extreme settings, such as tiny rooms or boxes, where ringing is intentional). The Color control provides a huge range of treatments, from rich and warm right through to cold and spiky.

If you directly compared the *TC Native Reverb* screen display to the busier one of the Waves *Trueverb*, you might initially expect that the TC plug-in would provide less scope for editing. However, each control of the *Native Reverb* does a lot, which makes it easy to quickly achieve the sound you want. Even using a Pentium 166 MMX, the *Native Reverb* only takes 44% processor overhead, due to well-optimised algorithms (TC Works recommend a minimum of a Pentium 133MHz, and for once I can believe it). The only drawback of this plug-in is its retail price of £329, which is as much as any of the sequencers that run it.

PLUGGING INTO THE FUTURE

Reverb is the one effect that almost every mix needs, and you do need at least one good one for more professional work. With a 166MHz processor, Waves' *Trueverb* could scrape through with 72% processor power, although once you have eight or more audio tracks playing back, as well as MIDI ones, you could be close to the glitching limit — TC's *Native Reverb* is much easier to use in this respect, if you can afford it. To give you some idea of normal overhead, the

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F 01706 222989.
W www.etcetera.co.uk

• SONIC FOUNDRY
£ XFX 1 plug-ins pack £199.
A SCV London, 6-24 Southgate Road, London N1 3JJ.
T 0171 923 1892.
F 0171 241 3644.
W www.sfoundry.com

• TC WORKS
£ TC Native Reverb £329.
A Arbiter Pro Audio, Unit 2, Borehamwood Industrial Park, Rowley Lane, Borehamwood, Herts WD6 5PZ.
T 0181 207 5050.
F 0181 207 4572.
E info@tcworks.de
W www.tcworks.de

• WAVES
£ EasyWaves £125; Native Power Pack £399.
A SCV London, 6-24 Southgate Road, London N1 3JJ.
T 0171 923 1892.
F 0171 241 3644.
E info@waves.com
W www.waves.com

Prices include VAT.

demo on the *VST* CD-ROM (six mono audio tracks, plus two MIDI tracks, four low-overhead channel effects on, and two Master effects) took a maximum of 30% overall, which is pretty good going. Having mentioned *Trueverb* yet again, I should also mention that the Waves *Native Power Pack* (reviewed in the June 1997 *SOS*) has recently had a price reduction to £399, and for a half-dozen top-notch effects this is even more of a bargain.

Waves' *AudioTrack* (an all-in-one plug-in which includes EQ, compression, gating, and expansion) is still being sold by Arbiter Pro Audio at a special price of £69, and hundreds have been sold since *Cubase VST* came out. Another new plug-in due from Arbiter Pro Audio early in 1998 is a software version of the Waldorf filter, for beefing up synth sounds. Full MIDI control will allow filter sweeps to be incorporated into a *VST* sequence.

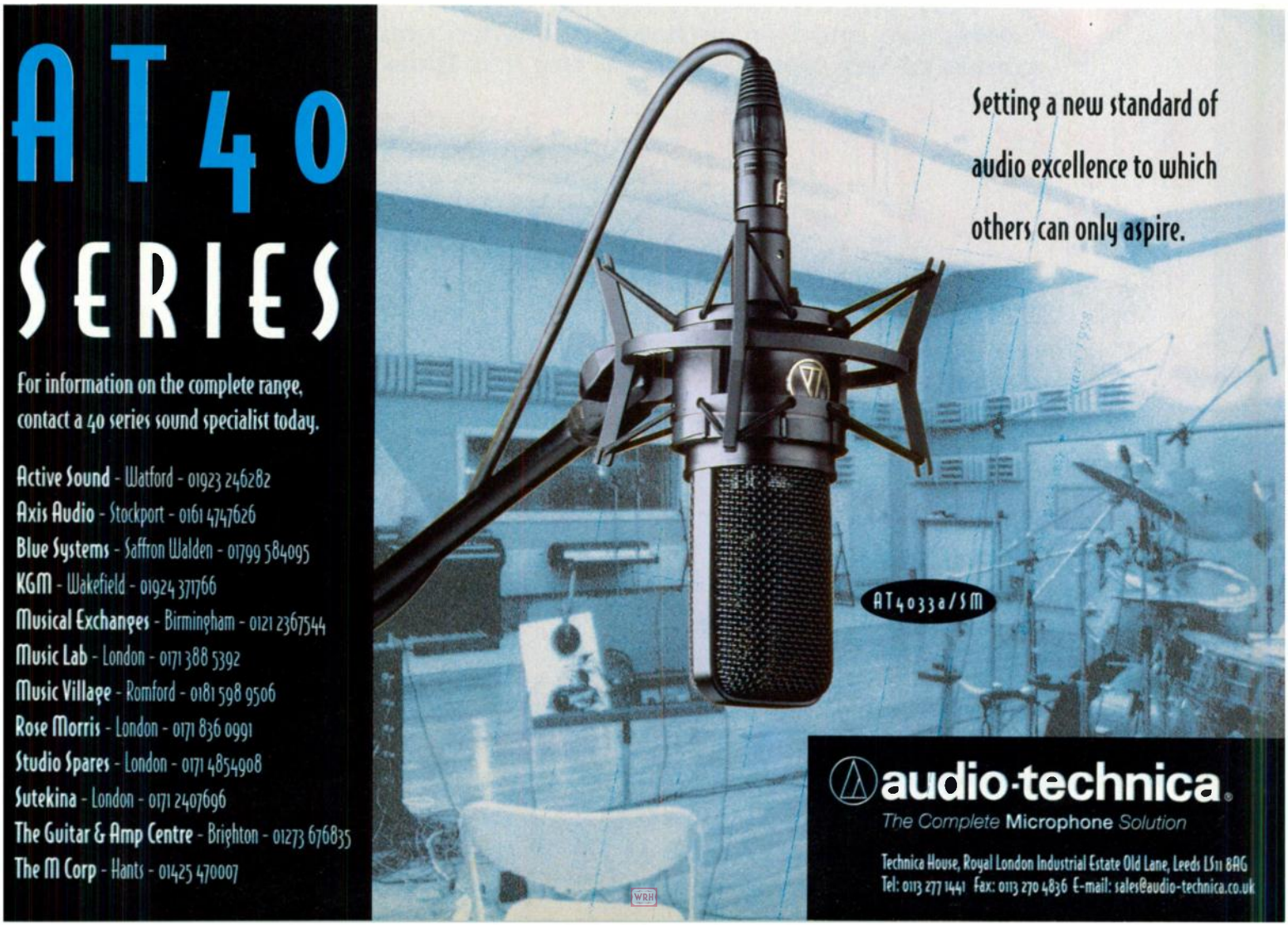
Many Mac developers are now in the process of porting their wares across to the PC. Prosoniq have announced that demos of all their plug-ins (including the *VoxCiter* and *Roomulator*) will be available in January, and the full versions by February. Traditionally, Mac plug-ins have been intended for high-end DSP farm use, with prices to match, but native versions (using only the PC processor) seem to be the norm for the PC, and prices are dropping accordingly. Even Waves have got in on the act, having just announced

"Another new plug-in due from Arbiter Pro Audio is a software version of the Waldorf filter..."

the *EasyWaves* pack, which consists of *AudioTrack* (mentioned above) and *EZVerb*, a reverb with presets taken straight from *Trueverb*. At a price of £125, this looks likely to sell and sell.

It seems that there are still a few compatibility issues, though, and no doubt by the time you read this others will have surfaced or been sorted. One of the minor annoyances is that many plug-ins are supplied with libraries of presets that only appear within certain host applications (as with the *XFX 1* pack mentioned earlier) but developers are generally sorting these bugs out fairly rapidly and making free updates available via their websites — I'll report on these in *SOS*'s PC Notes column.

With MIDI + Audio sequencers becoming more and more popular, and prices falling for the latest high-quality soundcards, the stand-alone computer studio is becoming an increasingly affordable prospect for many people, and without significantly compromised audio quality. The PC musician is no longer the poor relation in audio.



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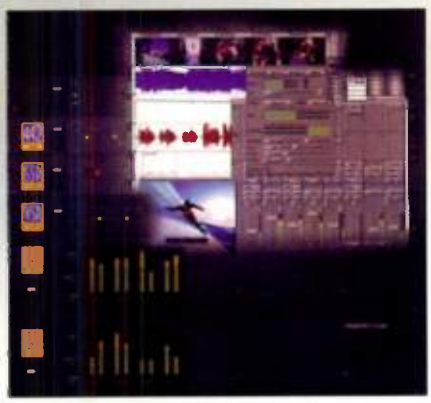

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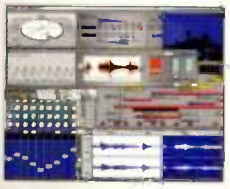

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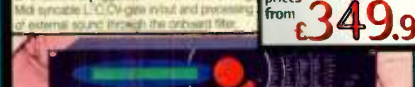

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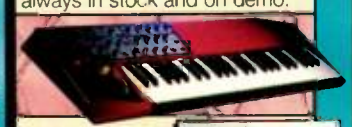

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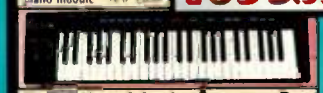

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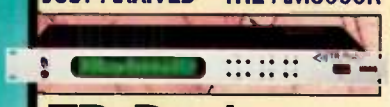

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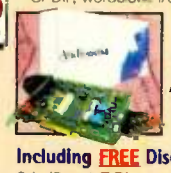

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All the power and features of the classic Akai S3000 range with the convenience of a built-in quad speed CD-ROM drive. In addition Music Village have a very special bundle deal. For just £1999 you get the CD3000XL fitted with 24Mb Ram, 4 CD-ROM discs and an Iomega Zip drive for storing your own samples. If thats not enough we also give you free lifetime membership to the Digital Village sound library.

- 10 outputs
- Built-in CD-ROM Drive
- 24Mb Ram
- FREE Zip Drive
- 4 FREE CD-ROMs
- FREE Digital Village Library Access

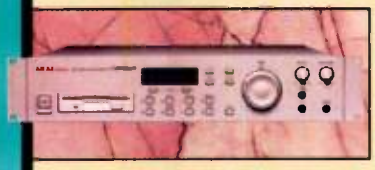
GUARANTEED £ BEST PRICE

Akai S20

Brilliant new low cost sampler

- High quality 16 bit Stereo sound
- 16 part multitimbral
- Expandable memory
- Easy to use
- Great build quality

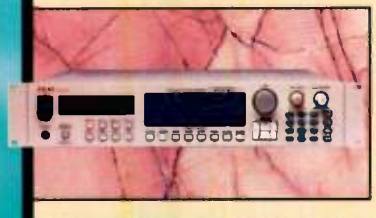
GUARANTEED £ BEST PRICE



Akai S2000

Low cost, totally expandable, exactly the same sound and quality as the S3000XL.

GUARANTEED £ BEST PRICE



Akai S3000XL

The industry standard sampler with 10 outputs, graphic waveform editing, resonant filters, SCSI, totally expandable to the spec of the S3200XL.

GUARANTEED £ BEST PRICE

Akai S3200XL

As the 3000XL but with optional IB304F filterboard and IB208T prefitted giving a third envelope, 2nd filter in every keygroup and ring modulation, distortion, delays and 4 reverbs.

GUARANTEED £ BEST PRICE

Akai MPC2000

Sequencing/Sampling Drum machine, SCSI as standard, 2Mb memory expandable to 32Mb, graphical waveform editing, rock solid timing and excellent swing function.

GUARANTEED £ BEST PRICE

FREE CD-ROM DRIVE PLUS 16 MEG WITH EVERY...

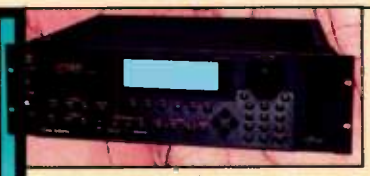
Akai EB16 Multi Effects

- Internal 4-way effects
- Works with CD3000XL, S3000XL & S2000

WORLD EXCLUSIVE ONLY £299.99

Akai SG01P Piano Module was £299

GUARANTEED £ BEST PRICE



Emu e6400

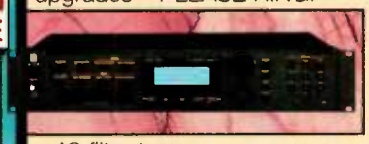
The sampler that breaks the mould!

Emu's best selling professional sampler. The filters and ease of use make this no.1 choice for Jungle and all sound and sample manipulation.

- 64 note polyphony
- 64 meg upgrade

SCOOP – Village can offer you the best prices on 64meg upgrades – PLEASE RING!

VILLAGE EXCLUSIVE £1799.99
(including FREE CD ROM Drive)



Emu ESI-4000

The latest affordable Emu with the famous E4 filters and excellent DSP for those who really want to mutate their sample. Expandable with digital I/O, 6 additional analogue outputs & FX by adding the Turbo board.

- 18 filter types
- 64 voices
- expandable to 128Mb RAM
- 4 outputs
- upgradable with Turbo option

GUARANTEED £ BEST PRICE

GUARANTEED £ BEST PRICE

Turbo Board for ESI-4000 & ESI32

The world renowned E4 filters are now available to ESI owners, and if that's not enough you now get an additional 6 outputs (taking the total to 10), digital in/out and dual FX processing (also derived from the E4). This is the upgrade ESI owners have been asking for and EMU have come through in a BIG way.

- E4 Filters
- 6 Additional outputs
- Digital in/out
- Dual FX processing

£299.99
(If bought with ESI-4000)

ESI-4000 + Turbo Board

Special Bundle Deal

GUARANTEED £ BEST PRICE

E-Synth

EMU owners have long known that their sampler has a hugely powerful synthesiser under the bonnet if only it had onboard sample ROM. Here's the Emu that really does give you the best of both worlds, all the great features of the E4X (64 note polyphonic, internal hard drive, 24bit dual FX, Digital i/o balanced outs) and now 16Mb of ONBOARD WAVEFORMS there whenever you power up the machine.

- 16MB of onboard waveforms
- supplied with fitted hard drive
- expandable to 128Mb
- up to 16 outputs
- 64 note polyphonic

GUARANTEED £ BEST PRICE

16Mb Rom Board

Turn your EMU Emulator into an instant access synth. The sound ROM adds 16Mb of permanent sample memory to your sampler while all the preset parameters can be adjusted and saved to RAM, creating your own individual presets available instantly when you switch on.

GUARANTEED £ BEST PRICE

Emu Orbit

128 more presets (beat kits, LFO presets); 40 more beats, 28 songs.

Only £799.99

Emu Planet Phatt

A massive 640 presets, easy to edit with its 32 digital 6-pole resonant filters, loads of real time control and a Beats mode not to be missed

Only £799.99

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THE OUTBOARD & STUDIO CENTRE OF THE UNIVERSE

TLAudio Classic PA2

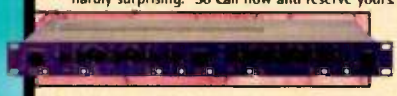
The fattest sounding stereo mic Pre and DI unit in existence!

- Classic valve sound for mics
- Balanced XLR microphone inputs
- Phase reverse switch on channel B
- Unbalanced instrument inputs with switchable sensitivity (guitar/keyboard)
- Peak LED's with variable brightness indicate degree to which valves are being driven
- For warming digital keyboards
- Balanced XLR outputs
- Continuously variable input gain controls
- Wonderful for guitar
- 48 volt phantom power

WORLD EXCLUSIVE ONLY **£229.99**

Up to 75% off TLAudio Indigo!

Without doubt, this has got to be THE processor deal of the year. Despite purchasing a huge quantity of these superb professional units, we have almost sold out of most models. Mind you, at these prices it is hardly surprising. So call now and reserve yours because this is a genuinely unrepeatable offer!



2011 2 channel, 4 band valve equaliser

With circuitry and facilities based on the original EQ-1 valve equaliser, the 2011 incorporates TLAudio's famously musical high and low frequency shelves, and 4 broad curved frequencies on each of the mid bands. Employing four ECC83/12AX7A valve stages per channel, the 2011 exhibits the wide bandwidth and low noise performance that characterises every TLA product. (Frequency response 20Hz to 40kHz +0/-1dB), your easiest route to EQ heaven, perfect for stereo mastering!

was ~~£704~~ WORLD EXCLUSIVE ONLY **£199.99**

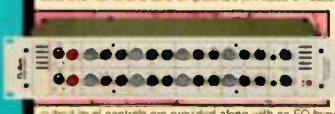
or Buy 3 (RRP £2112) FOR ONLY **£499.99**

New TLAudio Ivory Range

5001 4 Channel Valve Mic Pre-Amp

Each channel has input and output level controls, switchable +48V, phase reverse, 90Hz low cut filter and Drive and Peak LEDs which indicate how hard the valve stages are being driven. Mic inputs are on balanced XLR and Line outputs are provided on balanced XLR and unbalanced jack connectors.

£289.99



5013 2 Channel Valve Parametric Equaliser

Each channel has four band parametric equalisation with variable control of gain, frequency and bandwidth. Input and output level controls are provided along with an EQ bypass switch and instrument input on each channel. 'Drive' and 'Peak' LEDs indicate how hard the valve stages are being driven.

£459.99

5021 2 Channel Valve Compressor

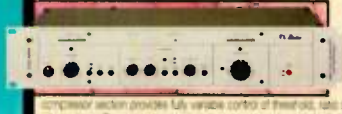
Each channel offers fully variable control of input and output gain, threshold, ratio and gain make up. Attack and Release times are switchable for 'fast' and 'slow' modes. An expander gate is provided with control of threshold. Metering is via VU meters. Works in dual mono or stereo linked mode, and a sidechain insert point is included on each channel.

£459.99

5051 Mono Valve Voice Processor

Combines a pre-amp with a compressor, expander/gate and an EQ section. The pre-amp features input gain control, +48V low cut filter and an instrument input. The compressor section provides fully variable control of threshold, ratio and gain make up. The EQ section features the same type of 4-band shelving/peaking arrangement as the Classic EQ-1.

£459.99



5050 Mono Valve Mic Pre-Amp & Compressor

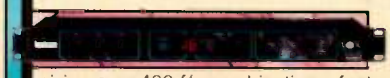
Combines a mic amp with a compressor. The pre amp features input gain control, +48V low cut filter and an instrument input. The compressor section provides fully variable control of threshold, ratio and gain make up, with a choice of 2 attack and release times. The master section includes an output gain control with LED meters showing gain reduction and output level.

£459.99

Check out these Mega Bundles!

TLAudio PA2 plus Audio Technica AT4033	£499.99	TLAudio PA2 plus TLAudio Indigo 2011	£399.99
TLAudio PA2 plus Audio Technica AT4050	£699.99	TLAudio PA2 plus TLAudio PA2	£399.99
TLAudio PA2 plus AKG C3000	£499.99	TLAudio PA2 plus Fostex DMT8VL	£999.99
TLAudio PA2 plus Røde NT1	£479.99	TLAudio PA2 plus Yamaha 03D	£2425.99
TLAudio PA2 plus Røde NT2	£629.99	TLAudio PA2 plus Sony DTC A8	£799.99

A Lexicon for under £150



Lexicon Alex
16 presets, 3 adjustable parameters

giving over 400 f/x combinations; footswitchable; legendary Lexicon quality reverb at a once in a lifetime price!

Order yours now! RRP was £429 Scoop Purchase **Only £149.99**

Lexicon PCM80

THE KING OF FX PROCESSORS!
True stereo, total editing, THAT Lexicon sound

GUARANTEED BEST PRICE

Lexicon PCM90

Featuring 2 Lexi2 chips totally dedicated to reverb. A classic that will survive generations.

GUARANTEED BEST PRICE

Lexicon MPX1

The MPX1 combines the legendary Lexicon reverbs into a true multi-fx unit. Multiple processor FX architecture featuring 2 independent micro processors – the proprietary lexichip II for the worlds best reverbs including unique ambience algorithm; separate DSP chip for multi fx; pitch, chorus, EQ, delay, modulation, reverb; up to 5 stereo effects simultaneously arranged in any order.

STUNNING SONIC PERFORMANCE

Only £739.99

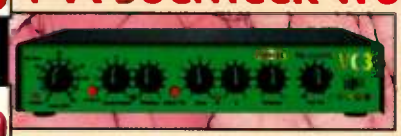
The perfect partnership – The AKG SolidTube mic + a classic optical Voice Channel from Joe Meek.

THE SOLID TUBE

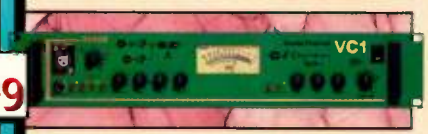
- Large diaphragm capsule
- Ground lift switch
- 20db attenuation switch
- Switchable bass cut filter
- Shockmount suspension

The SolidTube recreates that Vintage C12 sound at only **£799.99**

+ A JoeMeek from under £170



VC3 Pro-channel classic photo optical pre-amp compressor & enhancer.
RRP was £299
VILLAGE EXCLUSIVE **Only £169.99**



VC1 Voice channel rack-mount top of the range optical pre-amp compressor & enhancer.
RRP was £704
VILLAGE EXCLUSIVE **Only £399.99**

SC2 JoeMeek's flagship, best selling stereo compressor that recreates the warm and powerful sound of the 1960's.
VILLAGE EXCLUSIVE **Only £999.99**

Phone for enthusiasm and information on those and all JoeMeek products including the Meekualizer the VC2, VC4 etc.

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THE OUTBOARD & STUDIO CENTRE OF THE UNIVERSE

Boss SX700 Multi FX

- 20Hz – 20kHz bandwidth
- instantaneous program change
- easy editing • true stereo operation
- amazingly, this processor includes RSS, vocoder, reverbs, delays, pitch shift, space chorus, midi clock, tempo, 18 bit A/D & D/A, large LCD, stunning sound.

INCREDIBLE VALUE Only £329.99

Behringer Price Crash

for instance:

Composer Only £169.99

Dualfex - Dual Enhancer
Ultrafex 2 - Enhancer
Autoquad - Quad Expander/Gate
Edison - Stereo Image Processor
Ultra Curve - 64bit Dual DSP
Multicom - Quad Compressor/Limiter
Multigate - Quad Gate
Intelligate - Gate/Ducker

CALL NOW FOR THESE CRAZY DEALS!

dbx

266 Full featured, high performance dual compressor / gate using the new dbx autodynamic attack and release circuitry and gate circuitry, to deliver a truly musical and versatile unit at an unbeatable price. Only £169.99

286 Studio quality mic pre-amp combined with a compressor, de-esser, spectral enhancer and expander gate. Tremendous flexibility and now you can buy it from Music Village at an amazing... £199.99

120XP "Boom Box" Patented dbx sub harmonic synthesis gives your track the bottom end you have always wanted! Actually produces a new waveform modeled bass note, exactly an octave below the bass in the original audio. As used by top sound and film professionals. Just £249.99

1066 Stereo compressor / limiter / gate featuring selectable auto or manual compression, contour switch, over easy or hard knee compression modes, peak stop plus limiting, gold plated balanced XLR and jack ins and outs etc etc. Only £325.99

Alesis NanoCompressor

RMS / Peak Stereo Compressor / Limiter with sidechain input 1/3 rack size

NOW UNBELIEVABLE VALUE! Was £145 NOW Only £99.99

Alesis Midiverb 4

• 18 bit • 128 presets and 128 user-editable programs • superb reverbs, delays, flange, chorus, pitch shift

NEW LOW PRICE Only £249.99

Zoom 1201

- 363 presets • 24-bit processing
- 44.1 kHz sampling frequency
- Karaoke, Lo-fi & Vocoder effects
- true stereo

Only £99.99

Zoom 1204

- Up to 2 mono effects simultaneously
- Vocoder style effects
- Leslie Simulation
- Midi

GUARANTEED BEST PRICE

Digitech Mega Deals

Studio Quad – 4 ins & 4 outs

VILLAGE EXCLUSIVE Includes FREE 8 way Loom

Studio 400 Effectively 2 Studio Quads in 1 box with 4 ¼ inch jack & 4 XLR jack outputs. Plus FREE Digital I/O worth £199.99

GUARANTEED BEST PRICE

Studio 100 20 bit Multi FX unit. Dual engine processor – MIDI.

VILLAGE PRICE Only £179.99

dbx MC6 Mini Compressor

THAT dbx sound with sliding parameter controls Only £99.99

Drawmer MX30

Gate / Compressor / Limiter

A Superb new dynamics processor from one of THE names in ProAudio. Now you can have the legendary Drawmer quality for a Budget Price!

- Noise Gate
- Limiter
- Automatic Attack & Release
- Balanced In & Outs

RRP £225.99

Yamaha REV500

- 100 programs • 100 user programs
- 4 realtime control knobs on front panel
- 20 bit A/D conversion
- +4dB inputs & outputs
- true stereo

RRP £399 GUARANTEED BEST PRICE

SPL Stereo Vitalizer

- Stereo width control
- Big bottom
- Top-end mix sparkle
- Easy to use

Only £199.99

Vocalist Performer Brand new entry level machine, natural sounding harmonies, balanced mic input, stereo outs, 50 user presets with 8 variations for all music styles, reverb, auto-doubling

GUARANTEED BEST PRICE

MIDI Vocalist 4 voice detune for vocal thickening, vocoder mode, real direct control of each harmony voice, chordal mode for automatic vocal harmonies, comprehensive midi control, XLR mic input, ¼ inch line level input, bypass activation via external footswitch

Only £249.99

Vocalist Workstation 50 factory & 50 user programs, harmony types – scalic, chordal, chromatic, vocoder, pitch correct, editable reverb, gender, detune, vibrato, sconce mix, harmony range, 1 octave keyboard, faders for lead, harmony & reverb, XLR mic input & ¼ inch tip balanced +4/-10dBu selectable, ¼ inch balanced outs – Great product!

GUARANTEED BEST PRICE

Studio Vocalist Top of the range – 99 user & 99 factory programs, everything the workstation has got PLUS – dual mic inputs with 48volt phantom power, 4 individual harmony outs, aux send & return, all audio I/O except aux are XLR balanced & ¼ inch unbalanced, 2U rack, digital I/O, 5 part harmonies, pitch correction etc etc. This Pro machine at an amazing price!

GUARANTEED BEST PRICE

TC Electronic Finalizer & Finalizer MkII

The Finalizer is the machine that everyone has been waiting for. Your final mix can sound as if it has been mastered by a mastering engineer. Multiband compressor, 5-band EQ, 20-bit converters, digital in/out, phase metering, normaliser and 120 professionally engineered presets.

True quality at an unbelievable price! from £1499.99 new boxed

Focusrite Green Range

Focusrite are renowned worldwide for being the ultimate in signal processing, if a tad expensive. Now, however, the green range brings this stunning quality within range of us mere mortals!

Green 1 Dual Mic Pre Amp
Green 2 Focus EQ
Green 3 Voice Box
Green 4 Dual Compressor/Limiter
Green 5 The Channel Strip

Please call one of our Pro-Audio experts for more details

VERY LIMITED SPECIAL OFFER!

Focusrite - The legendary RED 7

The absolutely ultimate mic pre-amp/compressor

RRP £1760

VILLAGE EXCLUSIVE ONLY £1499.99

DAT Deals!

Sony A8 was £999 VILLAGE EXCLUSIVE Only £599.99

Fostex D5 – only £549.99
Sony A6 – £499.99

Always the best deals on: Tascam DA20MkII, Tascam DA30MkII, Panasonic SV3800.

36% off!!

Philips DCC730 Digital compact cassette recorder Only £159.99

up to 41% off DCC tapes!

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THE MIXING DESK CENTRE OF THE UNIVERSE!

49% off the Korg Soundlink 168RC!

- 16 digital inputs and outputs (adat optical)
- 8 analogue mic / line inputs (2 with phantom power)
- 3 band EQ (sweepable with 'Q' on mid)
- 2 superb internal fx processors
- automation – 100 'scenes', MIDI control

Yes, it's true – this fantastic price breakthrough is for real. Until now you couldn't even buy a stereo digital mixer for this price! Now we can supply this incredible 8 Buss digital desk for an amazing...

£969.99 (was £1899)

M.V EXCLUSIVE PACKAGE DEALS

Adat XT+168RC	Fostex D90+168RC	Fostex D160+168RC
only £2595.99	only £2099.99	only £2969.99

FREE TLAudio Indigo 2011 + TLAudio Classic PA2 worth £1100

Yamaha 03D

Up to 26 inputs (18 analogue standard), 18 outputs, 28 dynamics processors, 28 x 4-band fully parametric EQ, 20 bit A/D D/A, motorised faders, mouse input, MIDI machine control, 2 internal FX processors, large integral screen, 4 aux sends, surround sound.

FREE TLAudio Indigo 2011 + TLAudio Classic PA2 worth £1100 only **£2599.99**

Yamaha 02R

Up to 40 inputs (24 analogue standard), 40 x 4 band fully parametric EQ, 20 bit A/D D/A, motorised faders, 8 aux sends, large integral screen, optional meter bridge.

FREE TLAudio Indigo 2011 + TLAudio Classic PA2 worth £1100 only **£5599.99**

Promix 01 £995.99 including FREE LOOM

EXCLUSIVE!

Phonic MM122

- 4 mono channels & 4 stereo channels
- pro quality slider faders • gain control on all channels except 9-10 & 11-12 • high & low shelving EQ ± 15dB • phantom power
- 2 aux sends & 2 stereo aux returns
- pre/post switchable inserts on channels 1&2 and post fader inserts on 3 & 4
- 19" rack mountable

only **£199.99** plus FREE UM97 mic worth £50

Behringer MX32/8/2

- 24 mic inputs • 4 stereo channels
- 6 aux sends • sweepable mids
- 8 groups • 4 auxiliary returns

RRP £1495 **VILLAGE EXCLUSIVE** only **£999.99**

Behringer MX8000 Mixer Bridge for MX8000 Eurodesk in stock – £249.99 Also 'Cybernetic' automation software for PC – suitable for any desk with insert points! – RRP £499

MACKIE

A 1604 from £499.99

Unbeatable deals on SR Series, 8 Bus Consoles and 12, 14 + 16 Channel VLZ Models

Allen & Heath MixWizard WZ 20:8:2

Superb new true 8 bus mixer at an astonishing price!

- 28 inputs on mixdown • 6 aux sends
- 4 band EQ with 2 swept mids on mic/line channels
- 2 band EQ on stereo channels
- inserts on all mono channels and LR output mix
- phantom power • 100mm faders
- desktop or 19" rack mountable and much much more.

(RRP £960) with FREE 16 way Loom only **£799.99**

Soundcraft

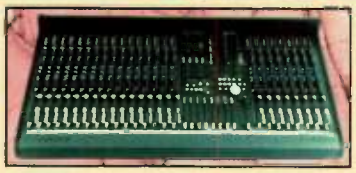
Spirit Studio

These superb mixing consoles are available in 3 configurations: 16/8/2, 24/8/2 & 32/8/2 and feature:

- In line design
- Up to 72 inputs at mixdown (32ch)
- Up to 32 discrete tape sends
- 8 Buss group section and stereo master
- Fader flip to save repatching • 6 Aux sends
- 4 Stereo FX returns with EQ
- 4 Band EQ (2 swept mid)
- EQ Switchable between signal paths
- 2 Band EQ on each group bus
- PFL soloing on all channel and monitor inputs etc.

Legendary Soundcraft quality at a fraction of the original price!

16-8-2 ONLY	£899.99
24-8-2 ONLY	£1465.99
32-8-2 ONLY	£1995.99



Ghost

LE and automated versions always available

- Ultra low noise inputs • Up to 12 aux sends
- MIDI mute automation • MTR transport control
- 4 Band EQ with fully parametric mids

GUARANTEED BEST PRICE IN EUROPE!

Folio FX16

16 channel 4 buss mixing console with Lexicon **DUAL FX!**

- Digital sound quality
- 26 Inputs to mix as standard
- 16 Mic/line inputs with ultra mic
- 4 Aux's • 3 Band EQ • Swept mid
- 4 Stereo returns
- 100mm faders throughout
- Real solo in place and PFL
- Channel group and mix inserts
- +48V Phantom power
- Rack ears optional

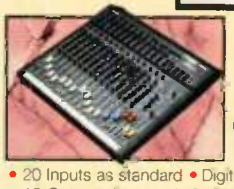
A PROFESSIONAL CHOICE RRP **£849**

Folio 10/2

- 6 Mono input channels • 6 Mic inputs
- 3 Band EQ with swept mid and hi-pass filters
- 2 Stereo channels with 2 band EQ and switchable gain
- Phantom powering for condensor mics
- PFL solo buttons • 2 Aux sends
- Separate monitor outs • Stereo tape return
- Stereo inserts across the mix

Classic Folio at an unprecedented price

WORLD EXCLUSIVE **£219.99**



Folio SX

- 20 Inputs as standard • Digital sound quality
- 18 Outputs (inc aux's & direct outs)
- 12 Mono channels with ultramic
- 4 Stereo inputs • 100mm faders
- 4 Buss structure with rear subgroups routable to mix
- Inserts on every mono channel and mix outs
- 3 Band EQ with swept mid • 3 Aux's
- Direct outputs from channels 1 – 8 for multitrack recording

GUARANTEED BEST PRICE

Folio F1

- 2 Versions: 14 & 16 input frame sizes
- Digital sound quality
- 8 Outputs (including aux's)
- 6 or 8 mono channels with ultramic
- 4 Stereo inputs
- 100mm faders
- inserts on every mono channel and mix outputs
- British 3 band EQ with creative swept mid control
- 3 Aux's with up to 2 pre or post-fader for foldback or FX
- Rackmount option

FROM ONLY **£299.99**

Folio Notepad

- 10 Inputs as standard
- 4 Mic inputs
- 2 Stereo inputs

ONLY **£149.99**

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Akai DPS12 Digital Personal Studio

Drop dead digital dozen!!

- 12 audio tracks
- 250 virtual tracks
- backlit graphic LCD
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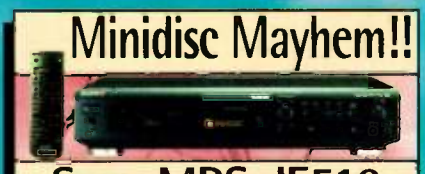

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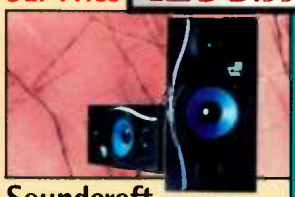

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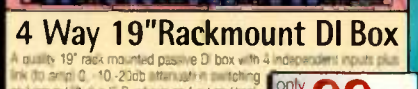

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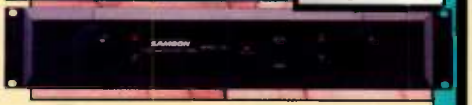

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Terra Form

TERRATEC AUDIOSYSTEM EWS64 XL PC SOUNDCARD

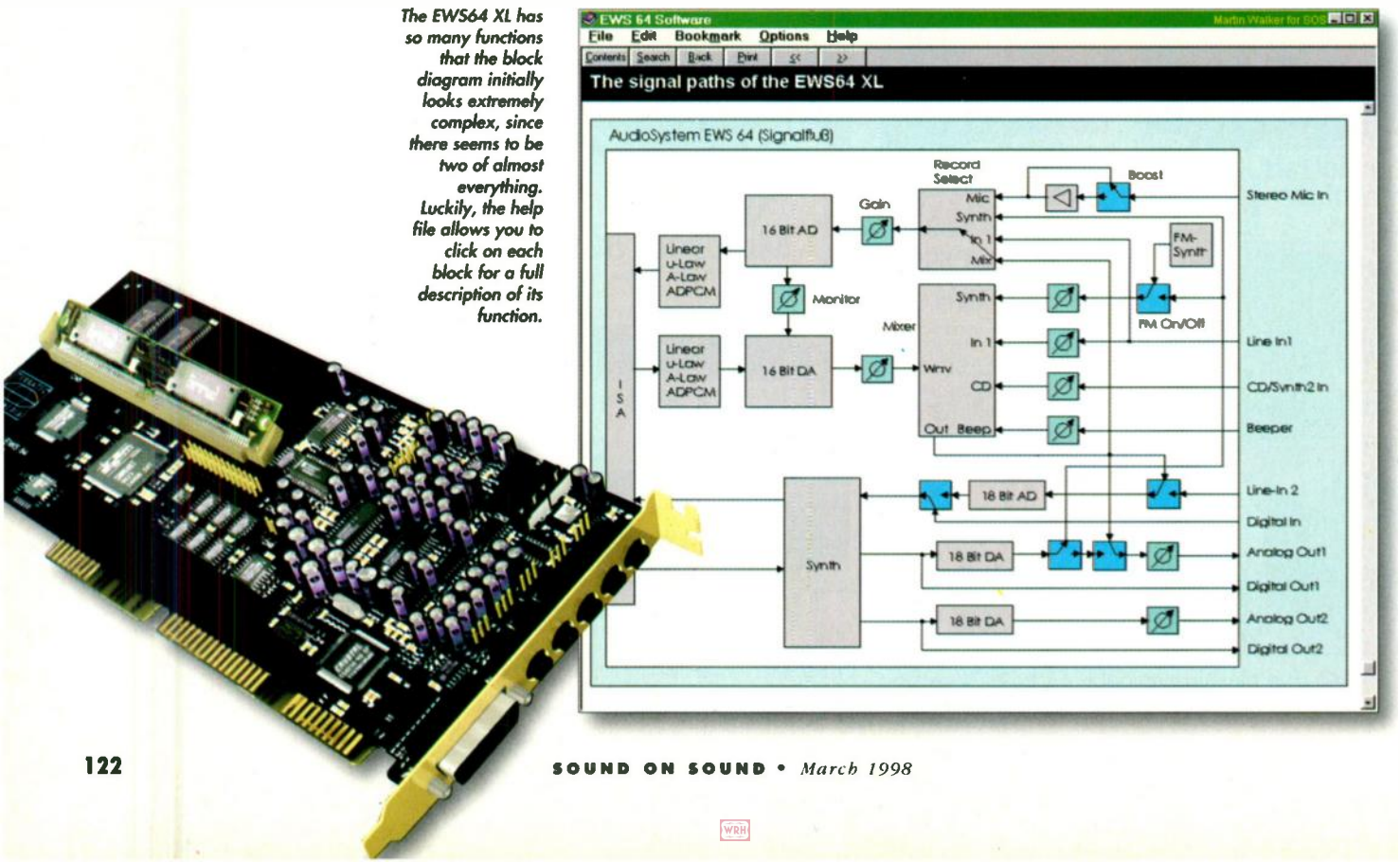
With a feature list longer than most people's arms, the EWS64 XL has whetted plenty of appetites. MARTIN WALKER dismantles his PC once again in the search for the ultimate soundcard.

There has been a lot of interest in the Terratec Audiosystem EWS64 XL — indeed, *SOS* has had more queries about the possibility of a review than for any other soundcard. It's not hard to see why. The EWS64's biggest carrot is its "studio quality" sampler, with up to 64-note polyphony, 6Mb of RAM (expandable to a huge 64Mb), 16-note multitimbrality, 24dB/octave filters, three envelope generators and two LFOs per voice, plus many of the performance features you'd expect to find in a rack unit. It also has a switched optical/coaxial digital input, two digital outs, two MIDI Ins, and two MIDI Outs, plus enough DSP power to mix up to 64 stereo digital signals, and an updatable operating system for adding more features at a later date. It's hardly surprising that people are frothing at the mouth.

With such an ambitious spec, teething troubles were almost inevitable, and the initial batch of drivers for the EWS64 (version 1.3) caused headaches for people who bought wher the card was originally launched in August 1997. On top of this, the sampler functions remained unavailable and were promised in the next software release. Version 2.00 drivers (available since before Christmas) have solved initial installation problems, but the sampler functions are still absent at the time of review, although they are promised by the time you read this. Naturally, we'll update you as soon as we've seen the sampler in action.

FEATURES

The EWS64 XL is a 16-bit ISA buss card which, at only about nine inches long, should present few physical installation problems. The origins of the card are in the games world, and it supports a large list of formats, such as SoundBlaster, SoundBlaster Pro and Adlib, as well as several MOD/Tracker sample formats (originally derived from the Amiga computer). One thing that has confused some people is that, due to the card's extensive compatibility with game sound formats, it often presents two ways of doing the same thing — one through the high-quality 18-bit A/D and D/A converters, which offer up to 48kHz sampling rates, and the other using the all-in-one Crystal CS4236B chip (which contains the SoundBlaster-compatible 16-bit A/D and D/A converters, and one of the MIDI interfaces). As you can see from the signal-path block diagram (below), there's an awful ▶



The EWS64 XL has so many functions that the block diagram initially looks extremely complex, since there seems to be two of almost everything. Luckily, the help file allows you to click on each block for a full description of its function.

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The EWS64 Control Panel certainly looks suitably hi-tech, and provides access to every possible knob and switch required. It would not, however, win any awards for ergonomics, and makes it rather difficult to follow the signal routing possibilities (the help file provides full details of the cryptic switching arrangements).

pros & cons

TERRATEC EWS64 XL £399

pros

- Clean, quiet 18-bit signal path.
- Digital I/O.
- Onboard capability for 64-voice sampler with filters.

cons

- Sampling options still not supported by software.
- Initially confusing signal path.
- Uses a lot of PC resources with all functions enabled.
- Poor quality reverb.

summary

A comprehensive and capable soundcard with a very good audio spec where it counts, and the benefits of digital I/O. The EWS64 XL has been hampered by late delivery of the sampler software (still not available at the time of review), but once this appears it will be a card to be reckoned with.

SOUND ON SOUND

lot crammed onto this board. The functions of the upper half (16-bit A/D, D/A, FM synth, analogue mixer) are largely consumer quality, and not really ideal for the PC musician in search of high-quality audio. It's the lower section of the board that's of most interest to us, since this is where the synth and the 18-bit converters are found.

The synth section itself is responsible for MIDI, Wave, and MOD processing, as well as audio effects (there's also WAV recording and playback functions at lower quality for game support). The synth/sampler component offers up to 64 voices, which emerge from Output 1 (with or without effects), while the Wave device handles up to 64 audio streams for hard disk recording and playback, and can be routed either to Output 2 or, via the effects, to Output 1. Extended full duplex is supported, and this allows recording of a single stereo input with simultaneous playback of up to eight WAV files. This is achieved in hardware, and so will use far less processor overhead than relying on software to mix multiple tracks to the same stereo output format. The MOD device deals with hardware support of Tracker files (again, a nod in the direction of the games fraternity). The effects consist of chorus (including flange and delay options), reverb, and V-space, a proprietary 3D algorithm for playback through either two or four channels.

On the audio side, the card has 2Mb of RAM permanently on board and comes with an additional 4Mb RAM card, giving you 6Mb straight from the box. You can expand this memory by discarding the 4Mb module, and plugging in one of a selection of other 72-pin types — a single-sided 8Mb SIMM, or standard 16Mb or 64Mb modules (but not 32Mb) with a speed of 60nS or better. I suspect that some people will want to expand straight away, and will be a bit miffed at having to immediately remove 4Mb, but it's not that much of a hardship, since 4Mb of RAM is now worth under £20. The operating system and the reverb and chorus use a small amount of RAM, so if you stick with the 6Mb of RAM supplied you'll be left with about 5Mb for your own sounds (or GM/GS soundsets).

Not content with filling the soundcard with features, Terratec also provide a 5.25-inch removable plug-in module, which attaches to the soundcard with two ribbon cables. This is designed to sit neatly in a spare drive bay in your PC, exactly like an internal CD-ROM drive, so that the extra facilities can be easily accessed from the front of the PC. On this panel are the two MIDI Ins and two MIDI Outs, and the digital I/O. The MIDI 1 set of sockets is connected to the internal synth, and MIDI 2 to the WaveBlaster (daughterboard) socket also found in the module. You can also use the joystick socket mounted on the soundcard itself as a MIDI In/Out, by diverting either MIDI 1 or 2 using a software switch in the supplied *EWS Control Panel* software; you'd then also need one of the standard conversion leads used by many other soundcards. There is a single S/PDIF input, but both optical and coaxial sockets are provided (selected, again, by using a software switch in *EWS Control Panel*). The two digital outputs can be used simultaneously, and each is connected to one of the two 18-bit D/A converters (although there are a variety of possible routings, normally the MIDI synth will appear on Digi 1, and the WAV file playback on Digi 2). The module also features a standard quarter-inch stereo headphone socket.

The driver and utility software supplied for review was an interim version, but by the time you read this a new CD-ROM version of the version 2.0 software will be available, with fully updated English help files.

INSTALLATION

Whenever I receive a 'full-featured' soundcard I take a deep breath, since they tend to use a lot of system resources, and this one is no exception. The manual states that, with all functions enabled, three IRQs, two DMAs, and nine I/O addresses are used.

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Korg Trinity	£call			
Korg SGPro X	£1799	£179	18 x £90	0%
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Roland KD100	£1499	£299	24 x £50	0%
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Alesis DM5	£299			
Evolution Mk149	£99			
Evolution Pro 61	£149			
Fatar 49	£79			
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Studiologic SL880 with Alesis Nanoplane	£799	£99	12 x £64.28	19.9%
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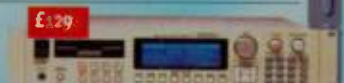

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Behringer MX2804	£309
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Zoom1204	£call
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Emu Planet Phat	£749
Ize Max X09	£call
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Novation Super Bass Station	£379
Roland Techno Card	£call
Syntechnic Tee Bee	£529
Waldorf Pulse	£319
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Waldorf Microwave 2	£849

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	Price
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Akai S2000 with 32meg	£950
Akai S2000	£549
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Behringer MX1602	£129
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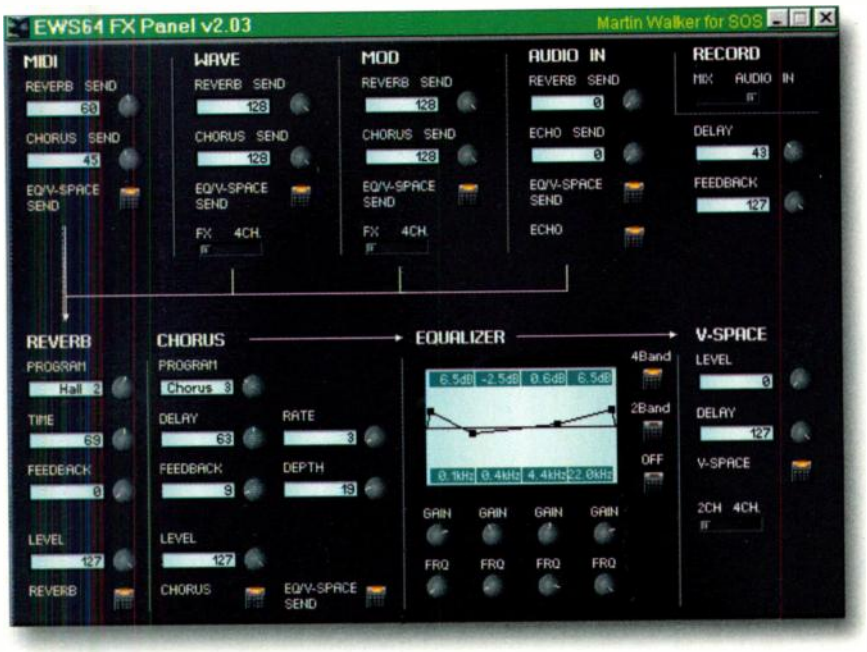

The FX Panel is easier to follow, and makes tweaking relatively painless. The 4-band equaliser is particularly well implemented, with click and drag points on the graph.

I brewed a flask full of strong black coffee and then read the manual through before I did anything else. If it's Plug and Play (as this one is), a soundcard can be simplicity itself to install, but with this many settings being managed by Plug and Play, if you have any legacy (pre-Plug and Play) devices in your PC you could be in for problems. Sure enough, after I had inserted the EWS64 XL and re-booted, my machine got partway through the install procedure, and then popped up "The CS4236 Codec was not found at the expected I/O address". When I clicked on 'OK' my PC crashed. This seemed a sure sign that Plug and Play had allocated one of the I/O addresses by default to a value already used by a legacy card (it has no idea what resources are used by these).

To find out what was causing the problem, I performed a cold boot, by pressing the hardware reset button on the front panel of the PC, then pressing the F8 key at the appropriate time during the re-boot, to bring up the Windows 95 Startup Menu (see the May '97 issue of *SOS* for my guide to PC Crash Recovery). From here I selected 'Safe Mode', which boots up into a minimal environment, and which excludes the majority of drivers (including the new Terratec ones that were causing the problem). Once inside Device Manager (from Control Panel, System), I could see what the problem was. Sure enough, the Terratec EWS64 XL Codec (the all-in-one consumer Coding-Decoding chip) entry showed in its Resources section that it was pointing at address 220h, which was also being used by my ancient Sound Galaxy soundcard. By un-ticking the 'Use Automatic Settings' box, I could then manually change this entry to 240h, which I knew was not in use. This is the huge irony of Plug and Play — if you still have any legacy devices, it's sometimes more trouble to work round it than if you had jumpers on the new card to set things up in the first place.

After I had restarted the PC, the next boot correctly installed the remaining drivers, and I emerged triumphantly into my normal desktop environment with everything functioning properly. You're unlikely to run into this problem unless you already have another soundcard in your PC with SoundBlaster support, but my experience does show how to proceed if anything goes amiss. Fortunately the software and hardware documentation are comprehensive and thorough as well.

AUDITION TIME

Once everything was working, I sat back to listen to the audio performance of the card, using a wide variety of MIDI files. The CD-ROM provided four sound banks — both GM and GS in 1Mb and 4Mb sizes. I loaded up the 4Mb GM set first, and the sounds were good, quiet and clean, although a little bland, but those of the 4Mb GS set were noticeably better, in particular the Grand Piano, which was far more rich and responsive. Both sets still came second to those of the Yamaha DB50XG daughterboard (the standard by which others tend to be judged), but this, of course, will be academic once full sampler support is available and users can fill up whatever RAM they have with their own sounds.

Of the effects (controlled from another utility), the Chorus worked well, adding life and movement to the sounds, and the 4-band (or 2-band) EQ was great for beefing up the overall mix. However, the reverb was decidedly metallic, and is better placed well down in the mix, or replaced by an external reverb. It might be possible to improve this with a future software update.

The internal synth is connected to MIDI 1, and as if acknowledging the huge number of resources taken by this card if everything is activated, MIDI 2 is de-activated by default (it takes yet another interrupt and I/O address). If you want to use the second MIDI In and Out on the module for attaching external MIDI synths, or to add a WaveBlaster-compatible daughterboard, you'll need to activate it first. This is done by deleting the MIDI 2 driver inside the Device Manager and restarting Windows, which then 'finds' the new hardware and activates the MIDI 2 driver. It's also possible to access the Wavetable synth without using yet another interrupt, but you do lose the facility of the MIDI 2 input.

On the audio side, I started by recording into input 1, and routing it through the Codec. Once I'd worked out which of the switch positions I needed on the *EWS Control Panel*, and selected the 'EWS64XL Codec Record' and 'EWS64XL Codec Play' drivers in *Sound Forge*, I tried some basic recording.

This is a 'consumer' chip, and cannot compete in the quality stakes with the other converters. Anyone who expects to use the two A/D analogue inputs simultaneously may be disappointed with the results. Sure enough, the unweighted RMS background noise was about -70dB (with peaks up to -55dB), which, while good enough for basic demos, is not really suitable for serious music work. Next I tried the same procedure using the rather better 18-bit A/D converter, routing through input 2, which also bypasses the analogue input mixer for an even cleaner signal path. I found that background noise levels were much lower

BRIEF FEATURE LIST

- Wavetable Synth/Sampler: 6Mb RAM supplied, expandable to 64Mb.
- Up to 64-voice polyphony.
- Sampler features (not available in review model): 24dB/octave filter, 3 EGs, 2 LFOs per voice.
- Effects: Reverb, Chorus, 4-band and 2-band EQ, 3D sound positioning. Available for all audio sources.
- Mic In: Wired for stereo mic (electret or dynamic). No phantom power.
- Line In 1: 8/16-bit consumer A/D, 5kHz-48kHz sampling rate.
- Line In 2: 18-bit high-quality A/D, 32/44.1/48kHz sampling rate.
- Line Outs: 2, both driven from separate 18-bit D/A converters.
- Audio Recording: Simultaneous, extended full-duplex recording (stereo) and playback of up to 8 stereo channels, internally mixed down to a single stereo output.
- S/PDIF digital I/O: optical or coaxial in, two coaxial outs.
- MPU401-compatible MIDI I/O: 2 external Ins, 2 external Outs (one connected to internal synth, other to WaveBlaster daughterboard socket).

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Key audio systems

This is what everyone is still waiting for — the Edison editor for the EWS64's sampler. This is its front panel, as shown in the software help file. The full version is expected, at the latest, by the beginning of March.

— Terratec are currently looking into the possibility of offering sample-loading direct from Akai-format CD- ROM. However, it is this 'vapourware' aspect of the card that will disappoint many people. As I write this review halfway through January (five months after the original release of the card in August 1997) Terratec are still working on the *Ed!son* (sic) Instrument Editor, which will give full access to the card's sampling functions. It's always difficult to establish exactly how long software development will take, and there have been unforeseen problems, but the Beta version is promised by the time you read this, as are several other utilities to allow users to create their own sample sets. Apparently Terratec have a close relationship with Steinberg (*Cubasis AV* is bundled with the card) and because of this, ASIO drivers for *Cubase VST* are also in an advanced state of development. A stereo driver is expected to be released before you read this, with a multi-channel version promised by the end of February. If all this happens, and Terratec UK are confident that it will, the EWS64 XL can definitely be recommended. However, it's not surprising that people who have already bought the card have been rather frustrated.

The EWS64 XL will suit those who want a good quality soundcard for audio and MIDI recording, and digital I/O, along with support for the occasional game. Its confusing aspects derive mainly from its game support, because although basic SoundBlaster support is vital for any card which is to be sold to games players, this support gives rise to a huge list of extra features and a convoluted signal path. However, once you look at the parts of the card specifically designed for musicians, the audio quality shines through, and the EWS64 XL should suit many people who want an all-round card for serious music use, as well as the odd game. Ultimately, if you want a single card that will do virtually everything, at the price there's not a lot of competition. A cautious thumbs-up. SOS

SLOT MACHINE

The synthesizer chip within the EWS64 XL contains 'virtual' devices, and since the operating system is supplied on an EEPROM (Electrically Erasable Programmable ROM), updates can be provided in the future as software downloads, to add new features and cure any bugs. The core of this chip is responsible for controlling MIDI sample playback and hard disk audio playback channels, as well as the effects and filters, and contains 64 processor 'slots' or 'units'. Playing back a MIDI sound requires the use of a single slot (and sometimes two), as does a hard disk audio channel. The Chorus effect takes three slots, the Reverb 13, and the 4-band equaliser eight. Since there are 64 slots in total, the maximum number of notes available at any time will depend on what other facilities are being used. Other restrictions are due to the ISA buss, which can theoretically achieve playback of up to 17 stereo WAV files at 44.1kHz. However, Terratec say that in practice you may manage a maximum of about eight stereo audio channels, or 14 mono ones, using the hardware mixing capabilities of the soundcard. This, of course, also depends on your hard disk recording software.

▶ (as I expected), measuring -89dB RMS (highest peak -76dB). Of the 10 soundcards I have tested to date, this excellent noise result is on a par with that measured for the Digidesign Audiomedia III, and is only bettered by the Event Gina, which measured -92dB RMS (-84dB peak). It's safe to say that Terratec have not misused the word 'professional' in connection with the EWS64 XL.

I did find the *EWS Control Panel* confusing, due to the number of different audio paths available, since labelling switch positions as 'A, B, and C' doesn't give you much idea what they do without constantly delving into the helpfile. I lost MIDI control of the synth for a while, until I realised that a switch on the *EWS Control Panel* had been changed, disconnecting the MIDI Input on the joystick adapter cable and re-routing it to the module MIDI sockets. However, once you get the appropriate signals coming out of the desired outputs and everything routed properly, it all starts to fall into place.

"Once you look at the parts of this card specifically designed for musicians, the audio quality shines through."

SUMMARY

The EWS64 XL is a truly ambitious product, and it's not surprising that there has been so much interest in it. Anyone who vaguely remembers compatibility with Akai samples being mentioned is not mistaken

Info

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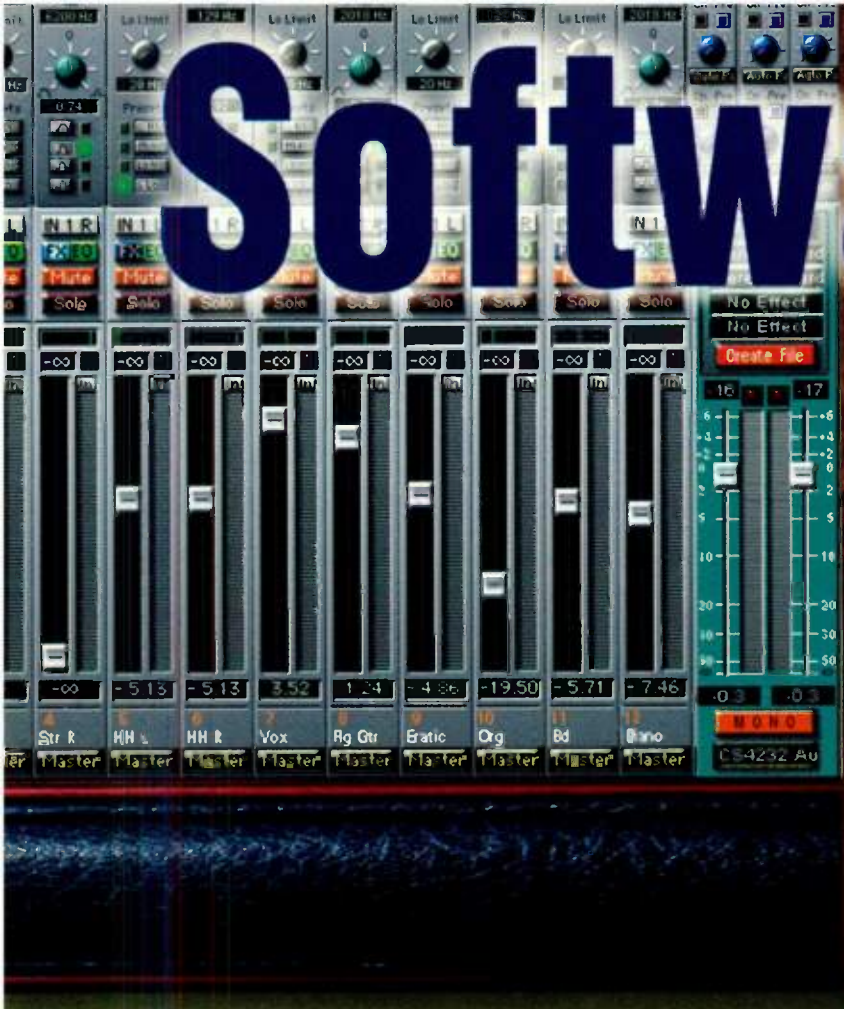

Although the answer is software, the **VST** experience lies somewhere between the two.

Steinberg's revolutionary **Virtual Studio Technology** is at the heart of the latest Cubase VST 3.5 for Mac OS and Windows platforms.

At first glance Virtual Studio Technology replaces a truckload of hardware, offering all the essential studio components in a reassuringly familiar format Mixers have long throw faders and bargraphs, effects processors have buttons, knobs and LED displays.

Plug-In to These

An ever-expanding range of Cubase-compatible software effects are available from manufactures such as Spectral Design, Waves, Arboretum and TC Works. VST for Windows supports the new Microsoft Direct X standard. Here's a couple of examples:

DeNoiser - RRP £299
Ideal for removing tape hiss or broadband noise this plug-in perform as well as equipment costing 50 times more.

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AudioTrack - RRP £169
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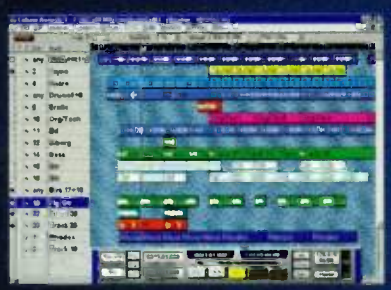
The Arrange Page

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 wi 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 on 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 recordin studio. But if you need to mix

Hardware?

But take a closer look and you'll discover an advanced level of functionality only possible in a software based environment. Like total recall of every operation and setting, the ability to arrange MIDI and audio simultaneously and specs that would simply break the bank in hardware - Try costing 32 channels of CD quality digital recording and mixing with 128 real time eq's

It's this combination of software power and flexibility with hardware sound and feel that makes VST a uniquely productive studio system.

externally then choose one of the many brand name multiple I/O cards. There is compatibility with any card complying with the current Windows MME standard and special drivers are written for the Mac platform. For each available stereo in/output Cubase will create a stereo subgroup to which every channel can be routed. Even auxiliaries can be routed allowing complete integration of external hardware. Event, Korg, Lexicon, DigiDesign,

TimeStretching & PitchShifting

If a drum loop doesn't exactly fit or a vocal note is slightly flat then simply use

the built-in DSP facilities to solve the problem and the new natural-sounding Formant Algorithm consigns Pinky and Perky to the toy cupboard forever.

Native Effect processing

Native audio processing uses the computers own processor to perform all effects functions without the need for any additional DSP hardware. Cubase comes complete with a whole arsenal of high quality native effects. Choose up to 4 simultaneous Aux and Master effects from

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Leather, teak, flightcase and light module regrettably not included!

Cubase VST 3.5 RRP £329
Cubase Score VST RRP £499

System Requirements:

Minimum: Windows 95 • Intel Pentium 100 MHz • 24Mb RAM • 256 colours 800x600 • Windows 95 compatible soundcard • Fast E-IDE or SCSI hard disc. **Recommended:** Windows 95 • Intel Pentium 166 MHz • 24Mb RAM • High colour (16 bit) 1024x768

PowerMac or compatible computer • At least PPC 601/80 processor, faster recommended • Minimum 16Mb RAM, 24Mb recommended • Second level Cache required • System 7.5.3 or higher

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Wavelab 1.6 is a dedicated audio processing and editing system for stereo mastering applications, including CD burning with PQ encoding and master listing.

Highly regarded for its ease of use and amazing processing speed, the programme has a comprehensive spec., including:
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Realtime plug-in interface with 9 effects
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Wavelab 1.6 for Windows

CUBASE VST 3.5
Steinberg

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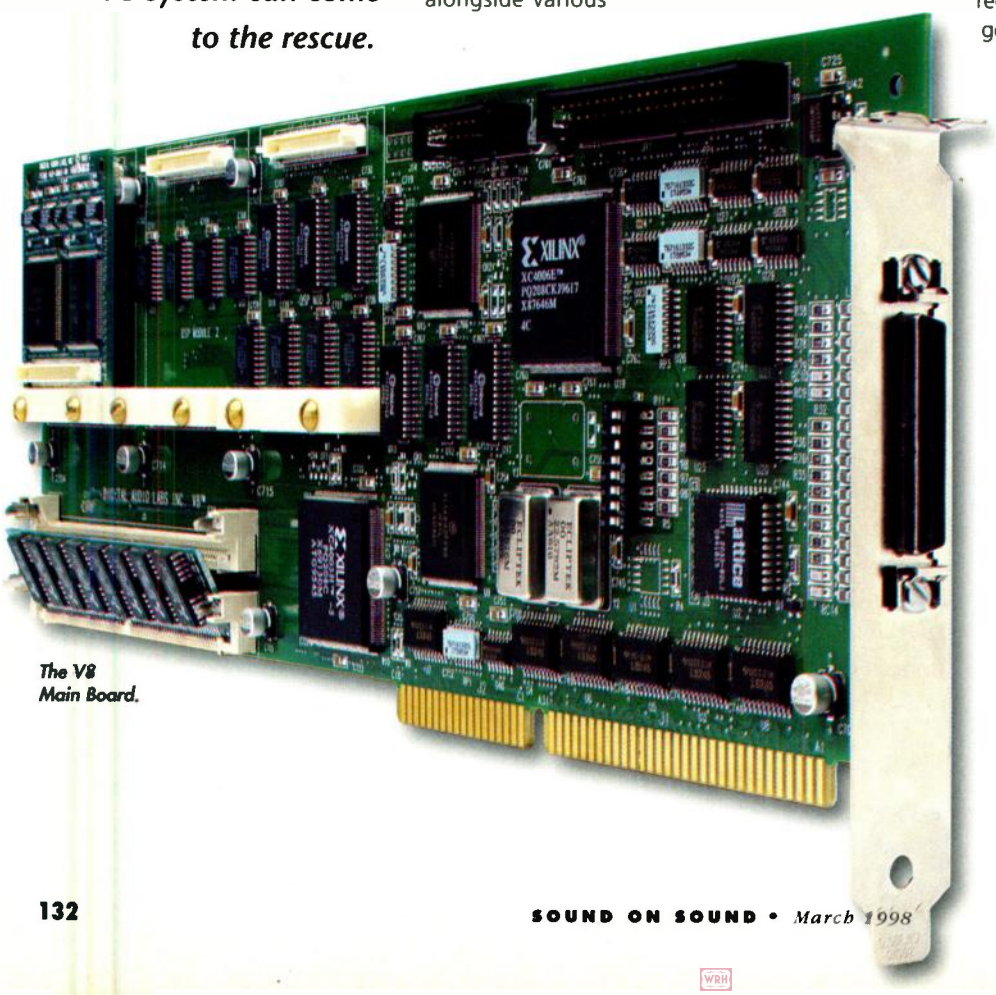
Once driven, forever smitten?

DIGITAL AUDIO LABS V8 MULTITRACK HARD DISK RECORDING SYSTEM

Hard disk recording always stretches any computer to the limit, and if you want eight simultaneous tracks or more you'll definitely need help. MARTIN WALKER finds out whether the V8 system can come to the rescue.

How would you fancy slotting a soundcard into your PC which would give you access to up to 16 simultaneous inputs and 16 simultaneous outputs, as well as an expandable onboard DSP setup that provides so much processing power that you can run loads of real-time EQ and effects from a Pentium 90MHz? This is exactly what Digital Audio Labs (DAL) claim for their new expandable V8 system, which, although it initially seems expensive, looks more and more capable the longer you examine it.

The philosophy behind the V8 system is to provide a 'modular DSP architecture' that allows you to start with an engine (the Main Board) of sufficient processing power to run alongside various other add-on expansion cards, as well as interfacing to the world of analogue via an entirely separate set of audio converters outside the PC (the Big Block). DAL's CardD+ (the original CardD was reviewed in *SOS* January 1994) has an excellent reputation for audio quality, and this has been carried over to the new V8 system. Signal-to-noise ratios in excess of 90dB are quoted, as is crosstalk between channels of below -100dB. All the analogue inputs and outputs are balanced, to make interfacing as painless as possible, and levels can be either -10dBV or +4dBu, selectable via software. Unlike the Soundscape system, reviewed in the November issue, the V8 system allows you to use any existing PC hard drive for recording, and since drivers are provided in general Windows 95 format, you can also run the V8 system from any existing Windows 95 sequencer.



The V8 Main Board.

Before you expire from excitement, I should also tell you about the on-board DSP power. Although the Main Board contains two industry-standard Motorola 56002 DSP chips, these are used to provide the basic I/O functions. However, there are three expansion slots on the Main Board, to add up to three DSP superchargers. These each contain a further two 56002 DSP chips, running at 80MHz, which give a huge boost to the total DSP power available. The idea is to provide additional horsepower which can take some of the load from the PC's main processor, so that lots more real-time EQ and plug-ins can be run. The final carrot is that these plug-ins are not to be developed at some time in the future by some previously unheard of company: some are already available, including a special version of the famous Waves *Native Power Pack*. The only drawback to these excellent plug-ins in their *NPP* format has been that a top-flight effect such as Trueverb takes something like 60% of the total processing time when running on a Pentium MMX 200MHz. With the V8 system, this overhead will be borne by the

DSP chips, leaving the main CPU lots more time to move a larger number of tracks.

Let's wipe up the pool of drool, separate fact from fiction, and see what happens in practice.

SOCKET TO ME

The Main Board is a full-length ISA expansion card that carries out all the digital duties. This is the nerve centre of the V8 system, and since it's so long it may cause problems in some PCs (see the 'Easy or Hardware' box) but should fit fairly easily into any PC with an ATX motherboard design. It contains enough horsepower to provide a maximum of 16 simultaneous Ins and Outs (connected to any combination of the associated hardware options). There's a single socket on the back of the card, and this attaches to a digital cable that runs to the outside world — there are no audio signals inside the PC. Although it looks like a 50-way Centronics to 50-way SCSI II cable, it isn't, so make sure you keep it separate from your SCSI cables, as you might damage the V8 if you plug in the wrong one. At the other end of this cable you connect one or more Big Blocks. These come in a 2U rackmounting case that is a lot more than a breakout box, since it contains all the audio converter circuitry. It has eight balanced analogue inputs and eight balanced analogue outputs, all of which are provided on quarter-inch TRS balanced jack sockets, and which feature 16-bit delta-sigma A/D and D/A converters.

Both input channels 1&2 and output channels 1&2 have their sockets duplicated on the front panel for easy access; plugging a lead into a front-panel input disconnects the corresponding input on the back panel, but the duplicated outputs are paralleled, so that you can use them both at once. Input and output levels and gains are set in software (see later) and all audio processing is carried out at full 24-bit resolution inside the PC.

Digital I/O is comprehensive, to say the least. There are S/PDIF sockets — a pair of co-axial phonos and a pair of optical TOSlink sockets on the back panel, with an additional duplicated pair of co-axial phonos on the front panel — and AES/EBU, with a pair of XLRs front and back as well. Only one of the total of five digital inputs can be active at any one time, and again this option is set in software. The outputs can also be software selected, as either AES/EBU (front- and back-panel sockets both active), or S/PDIF (front- and back-panel co-ax, as well as back-panel optical) are all available simultaneously. Also on the back panel is an IEC mains socket and a Centronics 50-way digital input socket, along with a further one to connect additional Big Blocks if you need more I/O capability (up to the maximum of 16 ins and 16 outs). The final feature on the front panel is a red 7-segment LED display that uses the decimal point as a power indicator, and the remainder of the display to show a unique ID number, used when attaching multiple Big Blocks to the V8 Main Board.

SOFTWARE

Once the hardware drivers and utility software have been installed, the Windows 95 installer will pick a suitable I/O address to be used by the hardware, which you note down before switching the PC off as requested. At this point you check the DIP switch settings on the Main Board (see 'Easy or Hardware' box) and then install the card. When you next boot up your PC, the V8 hardware will be initialised, as it will be every time you boot up your PC in future. Any connected Big Block(s) ▶

pros & cons

DAL V8 SYSTEM

pros

- Up to 16 ins and 16 outs simultaneously.
- Expandable modular design for interfacing additional analogue and digital devices.
- Excellent audio quality using Big Block external converters.
- Impressive real-time DSP processing power with an expanded system.
- Support for Waves plug-in bundle from day one.

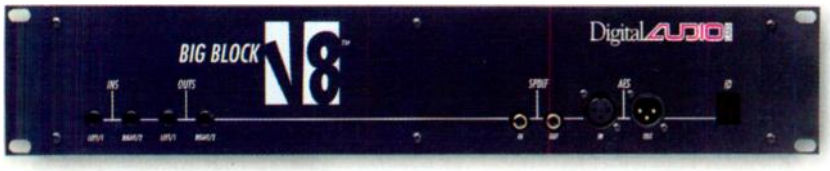
cons

- Motherboard manufacturers are beginning to slowly phase out ISA expansion slots.
- Full-length card may not fit in all PCs.
- Only *MxTrax* software can currently access all the V8 facilities.

summary

This is an impressive-sounding system, with excellent theoretical possibilities for further expansion. However, its high cost, as well as its multiple ISA-card structure, makes it more suitable as a complete PC turnkey system than for an end-user DIY approach.

SOUND ON SOUND



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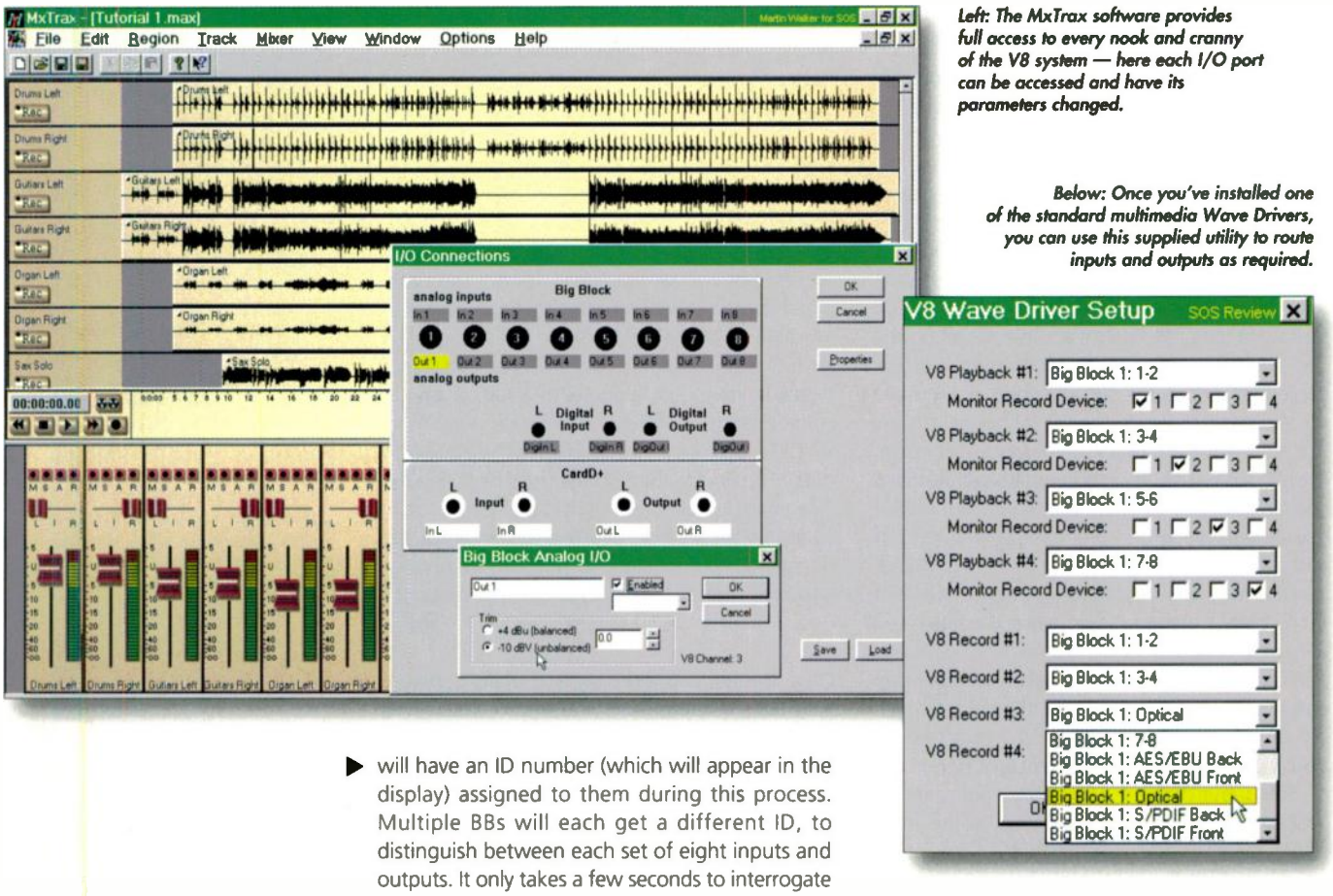


Left: The MxTrax software provides full access to every nook and cranny of the V8 system — here each I/O port can be accessed and have its parameters changed.

Below: Once you've installed one of the standard multimedia Wave Drivers, you can use this supplied utility to route inputs and outputs as required.

▶ will have an ID number (which will appear in the display) assigned to them during this process. Multiple BBs will each get a different ID, to distinguish between each set of eight inputs and outputs. It only takes a few seconds to interrogate the hardware. The Main Board finds all attached peripherals and options, registers them, and then makes them available to the software.

The Big Block analogue I/O box can also be fully configured using software; individual inputs and outputs can have their sensitivities altered to suit -10 or +4 levels, and all inputs and outputs are actively balanced, although, once again, this can be software-adjusted on a project-by-project basis (to suit the external equipment attached at the time).

The DAL website suggests that you could set inputs 1-4 unbalanced at -10dBV levels, and 5-8 as +4dBu balanced, to suit a particular project. However, during my efforts to make the V8 work in my PC, I discovered that these adjustments can only currently be made using V8-aware applications, and not by the Windows 95 *Wave Driver* software. It seems bizarre that no separate utility is provided, since the V8 advertising specifically mentions being able to use your favourite audio software. It's a bit like being invited to buy a swimming pool, and then being told that you can only use the shallow end.

If you opt to buy V8-aware software, there's a package called *MxTrax* available, which is specifically designed for the hardware and written by the same people who gave us *FastEdit* for the CardD soundcard. There are various other 'V8-compatible' applications too, and these directly call the V8 software drivers. Currently, apart from *MxTrax*, the latest update of *Cakewalk Pro Audio* 6.01 is V8-compatible, as are Emagic's *Logic Audio* 2.6 and a new version of *Samplitude* 3.0 from SEKD. If you already use these applications, it would be wise to check just what extra V8 facilities they can access.

To allow V8 to work with other standard Windows 95 applications, you can also install a 'Wave Driver', by using the Add New Hardware section within Control Panel. The manual provides step-by-step instructions on the procedure. Once installed, the V8 system is seen by standard Windows 95 software as four separate stereo soundcards, providing access to all eight channels of a Big Block. If you expand your system, up to four

EASY OR HARDWARE

Before you decide whether the V8 system will suit your requirements, you'll need to check inside your PC to see if it will accept a full-length expansion card. Although the newer ATX motherboards allow full-length cards in nearly all slots, many 'baby-AT' motherboards have severe limitations when it comes to fitting any full-length expansion card. The Main Board is an ISA expansion card, and at just over 13 inches long is the biggest I've ever seen! Fortunately, one of the four ISA slots inside my PC could manage this — of the remaining three, one was blocked by a loom of wires connecting the front-panel switches to the motherboard, and another two were obstructed by the processor heatsink and fan. Frankly, few mainstream expansion cards are more than three-quarter length nowadays, so it's not surprising that many PC motherboard manufacturers don't view this as a problem.

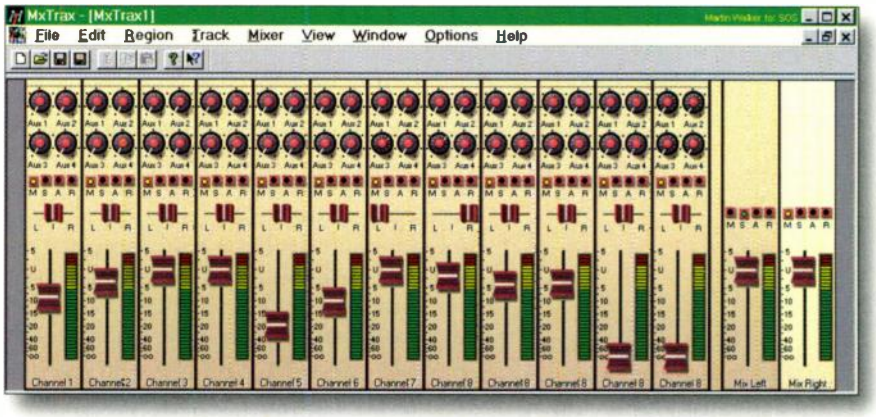
At first I seriously thought I'd have to admit defeat and wouldn't be able to get it plugged in at all, but eventually I managed to shoehorn the Main Board into my PC by bending the card slightly along its length, and wrapping a sheet of paper around it where it pressed against other components on the motherboard. I must admit to having my fingers crossed when I first switched on, but it passed every one of the hardware diagnostics tests. The three DSP modules were still well out of the way of anything else, but the supplied SRAM induction module ended up touching the CPU heatsink, only separated by my sheet of paper. This is not the fault of DAL, but a limitation of some motherboards. However, unless you're happy ferreting about inside your PC, this is one card that may need a practised pair of hands to install.

There's also a set of DIP switches to set, for selecting a single I/O address — the default setting is 300h (hexadecimal), but mine came from Et Cetera set to 240h, which is probably a better option for most people, as it is more often unused in most PCs.

such Wave Drivers can be installed, each giving access to another eight ins and outs. The big distinction is that only V8-aware applications can access the real-time DSP power and software-configurable options — other packages can access all the ins and outs, but nothing else. DAL are trying to make it as easy as possible for other software developers to produce V8-aware versions, and any product that does fully support the more interesting parts of V8 will earn a 'Gearhead Approved' symbol.

IN USE

Rather than going right in at the deep end with the supplied *MxTrax* software, I decided to start by trying the V8 with the audio applications already on my hard disk. It was here that I began to encounter problems. The most I could get out of any application when playing back audio was a couple of strangled squeaks, despite the fact that the supplied hardware diagnostics utility passed all its tests with flying colours. I downloaded a newer set of drivers from the DAL website and installed these, but still no joy. I also re-installed the hardware with a different I/O setting (by changing its jumper switch settings), re-initialised the drivers, and tried several different available IRQ and memory settings. Finally, I removed a total of three other expansion cards from my PC, just in case anything was conflicting that didn't appear on the comprehensive print-out of resources already used by my PC. Nothing cured the problem, and in the end, despite the best technical efforts of Et Cetera (the UK distributors) by telephone to get the system working in my PC, they had to send me a complete PC with V8 already installed. This is what they had wanted to do in the first place, but when the system is advertised as a series of components at individual prices, this does suggest that users ought to be able to personally install the system. I have never encountered any such problems with eight other soundcards that have been installed in my PC.



Above: The mixer in MxTrax is fully configurable, and even Automation is available, which allows fader and pan control movements to be recorded and played back.

Once the Et Cetera PC system arrived, things went more smoothly, and I could finally listen to the audio quality and run the *MxTrax* software. The Wave Drivers certainly worked with everything I tried, and using *Sound Forge* I measured the noise level of an analogue input at -88dB (unweighted), which is very respectable. Sound quality was clean and warm (delta-sigma converters do tend to have this reputation) but I did notice a delay of a second or so before playback began. This didn't cause any problems but was long enough to make everything feel rather sluggish.

MxTrax has been designed from the ground up to work with the V8 system, and therefore provides access to every possible hardware adjustment, as mentioned previously. The mixer section (see screen shot) is also fully configurable — you create the mixer of your dreams by dropping faders, pan controls, aux sends, EQ modules and mute/solo buttons onto a blank mixer panel, using the Components Toolbox. Once you've finished designing a single channel, it can be duplicated to build a complete console. The input and output connections to each send and fader are configurable, so you can assemble as ▶

SPEC CHECK

The first thing I noticed about the V8 soundcard was that it contains two chips from Xilinx, a company specialising in FGPA (Field-Programmable Gate Arrays) that I first discussed in detail as part of the Digital Wings Audio review in the December '97 issue of *SOS*. However, since all the audio circuitry resides within the Big Block, it is this specification that is most relevant to the musician.

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"This is a system with an impressive specification, and great expansion possibilities."

▶ many busses as you like, to suit your way of recording. Full ADAT transport control is also on offer if you have added the MDM Custom Interface card (see 'Expansion Possibilities' box), and real-time effects can also be patched in if you have extra DSP power added. Each design of mixer can be loaded and saved to hard disk, and you can save a particular mixer with the project data. This all worked well, and seemed very comprehensive, but *MxTrax* is currently the only piece of software that can fully access the power of the V8 system, and it may not suit everyone.

CONCLUSION

This is a system with an impressive specification and great expansion possibilities. However, unless you have a PC dedicated to audio use (and this is a sensible idea), you may find your ISA slots already too well populated to take full advantage of the possibilities. Most people should be able to fit the Main Board, but as for adding the other expansion cards, such as the MDM Custom or Deuce Coupe (see 'Expansion Possibilities' box), you'll need a fairly empty PC to start with. Et Cetera feel exactly the same — they are proposing to distribute the V8 through a few selected dealers, and primarily as an already-installed part of a complete PC system package. This cocoons the end user from potential installation problems, which, judging by my teething troubles, is probably a good thing. Buying a complete system will appeal to those who want a turnkey solution, so suitable software will need to be pre-installed as well. Currently, only the *MxTrax* package directly supports the V8, to provide access to the juicy DSP bits, and although this software is comprehensive, it is unlikely to suit everybody. With any luck, other software developers will produce additional support for the V8 system, which will make it a much more attractive proposition.

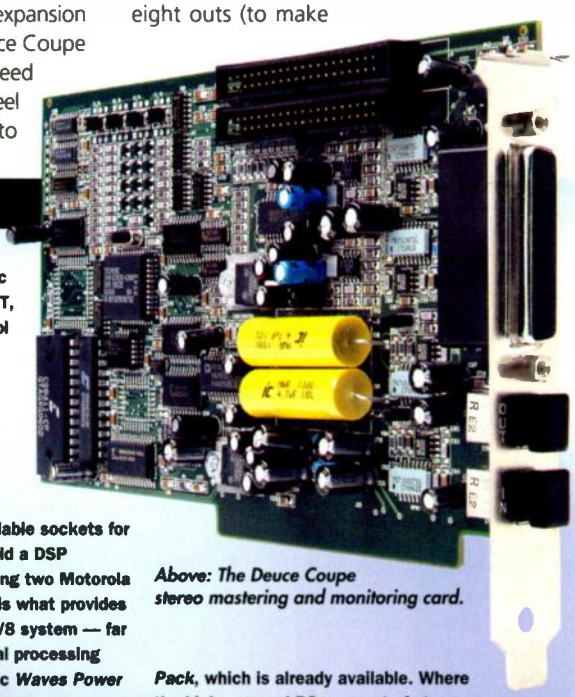
For a system that includes the Main Board, Big Block and *MxTrax*, the total price would be around £3700. This system gives eight simultaneous ins and eight outs. If you have an ADAT digital 8-track machine, you can add another eight ins and eight outs (to make

EXPANSION POSSIBILITIES

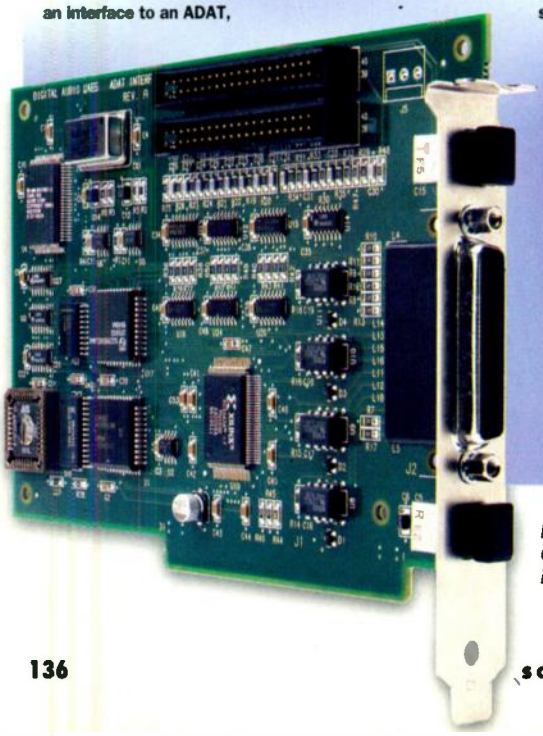
The V8, as you've probably already gathered, does a lot more than providing the engine for the eight ins and eight outs of the Big Block. It can run up to 16 simultaneous inputs and outputs across the V8 buss, which means that more Big Blocks can be attached if required. The V8 can also support additional internal cards, which are available in several forms and connect to the Main Board using internal ribbon cables. The Deuce Coupe (not supplied for this review) is a stereo analogue, stereo digital card that also fits into an ISA slot. Its main function is to provide separate stereo mastering and monitoring facilities, but existing owners of a CardD can also integrate this into the V8 system in a similar way. Multiple Deuce Coupe cards are supported by V8.

The MDM Custom is another 8-bit ISA card that integrates with the Main board. This provides an interface to an ADAT, with 8-channel optical input and output, as well as a 9-pin to 25-pin sync cable which locks the V8 with the ADAT, and which provides full transport control of the ADAT from V8-aware applications (such as *MxTrax*), as well as sample-accurate sync. Again, multiple MDM cards are supported by V8, as long as you have spare expansion slots.

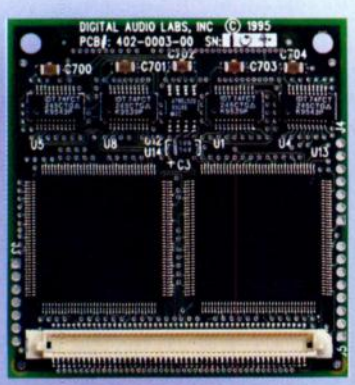
One reason why the V8 card is so large is that there are also three available sockets for DSP expansion, each of which can hold a DSP Supercharger module (£449) containing two Motorola 56002 chips running at 80MHz. This is what provides one of the main attractions of the V8 system — far more real-time power to run digital processing software, such as the V8-specific *Waves Power Pack*, which is already available. Where the high-powered PC runs out of steam, a V8 system will still be going strong. Finally, the RAM Induction Module (£449) adds 128Kb of fast SRAM for "enhanced time-dependent algorithms", and this is used to enhance the performance of delays and reverbs.



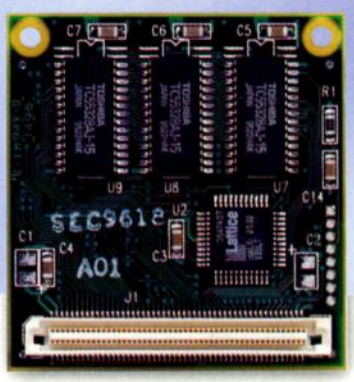
Above: The Deuce Coupe stereo mastering and monitoring card.



Left: The MDM Custom ADAT interface.



Above: The DSP Supercharger module.



Left: The RAM Induction module.

full use of the potential power of the 16-channel Main Board hardware) by plugging in an MDM Custom card (total system cost £4250). Alternatively, adding another Big Block (total system cost £5400) would give 16 analogue ins and outs, which would be ideal for recording a complete band with live drum kit. Additional real-time DSP power for real-time effects would require one or more DSP modules, at £450 each.

You get the picture — this is not a budget hard disk recording system. You really need to spend at least £4000-5000, plus the cost of your PC, to get a fully-fledged system — but then you'd have an extremely powerful setup. Of course, one of the beauties of the V8 is that it is modular; you could start with a basic system (Main Board and a single Big Block) and expand as required in the years to come. However, with this projected total outlay, any potential purchaser will have to consider the possible long-term future of the V8 system. It must also be said that ISA buss cards do seem to be slowly being phased out, but I understand that DAL are already investigating the possibility of PCI alternatives. They do have a long-term commitment to developing the V8 system over a number of years, so it will be interesting to see what future developments occur.

Certainly, there is great potential, and it is encouraging to see that Waves have already produced a V8 version of their plug-ins, but until some more software developers get behind it, this is not a PC equivalent of Pro Tools for the Mac. I never thought that I'd end up recommending that people look at a Mac system, but I suspect that anyone interested in a complete system at this sort of price will also have a Mac equivalent on their shortlist, and Digidesign already have huge support from other software developers.

I wish DAL well with the V8 — it's a brave venture, and producing a high-end PC system like this is to be applauded, especially with an engine capable of 16 simultaneous ins and outs. However, for high-end audio hard disk recording, the PC needs a totally reliable solution to recommend it to professionals, so buying it as part of a complete PC system would seem more sensible than attempting the DIY approach. The bottom line has to be that if this is the sort of spec you're looking for, go to a participating dealer, and see and hear the V8 in action for yourself. If it does what you want, and is within your budget, put it on the shortlist. SOS

> "One of the beauties of V8 is that it is modular — you could start with a basic system and expand as required in the years to come."

info

£ V8 16-channel soundcard £1399; Big Block 8-channel external interface £1499; Deuce Coupe stereo analogue/digital internal interface £549; DSP modules £449; SRAM module £449; ADAT interface £549; *MxTrax* software £499. Prices include VAT.

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- Zero harmonic distortion even at low frequencies
- Unnecessary level scaling and limiting thus improving signal to noise ratio
- Release free operation avoiding unwanted pumping artifact
- Overall improvement in signal to noise ratio

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CHRIS PORTER: Producer -
George Michael, Take That, Pet Shop Boys

"Duy have produced an array of plug ins which are elegant in their simplicity and useful in many situations."

BILL PADLEY: Wise Buddah Music Radio

"If you've never heard of DUY I suggest you make it your business to... We do a lot of music for our BBC Radio One sessions here and the Valve plug in has sent many a guitarist away happy"

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"I am greatly impressed with the quality & useability of all the DUY plug ins, Shape being my current favourite."

Pro Tools 24

- **Integration with Mackie Designs' new Hui Controller** - which is now available and on demo
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- **New d24 card** - Supports up to 16 channels of I/O providing the core system with up to 24 channels using the 8-channel I/O connectivity of the DSP Farm

DUY DSPider

A modular synth TDM plug in! Waveform generators, filters (with resonance) and waveshapers are just a few features of this groundbreaking software.

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SOUND ON SOUND

PC Soundcard Buyer's Guide

PART 2: MULTI-CHANNEL CARDS

If you want to move to the heady heights of true multitrack hard disk recording on your PC, there are plenty of rival systems on the market. MARTIN WALKER looks at what you need to consider in making your purchase decision, and rounds up the alternatives.

Emagic's Audiowerk8.

When you begin to consider upgrading from a comparatively simple PC hard disk system based around a stereo soundcard to one incorporating a multi-channel card, a whole new confusing world opens up before you, full of different companies with designs on your money. So why, you might ask, would you want to get involved with multi-channel cards at all?

Well, as we saw last month, stereo-only cards can be used with modern multitrack sequencers, but your PC's processor needs to be able to cope with the strain of mixing down your multitrack audio data to a single stereo pair in real time when you play back your recordings. Herein lies one of the advantages of a multi-channel card; along with more hardware channels, the multi-channel soundcard often comes with extra DSP (Digital Signal Processing) power to help with the workload and provide extra features, leaving your PC's processor in a far happier state. However, this does give rise to confusion where high-end soundcards are concerned, since access to all these extra facilities may be provided in various ways.

THE MIDI MINEFIELD

Before we get as far as narrowing down the multi-channel audio options, we need to consider the subject of MIDI support. Many manufacturers bundle their multi-channel soundcards with proprietary software for handling digital audio, so that every audio function integrates and performs well. However, few of these software packages provide MIDI support as well as audio, meaning that if MIDI is essential to the way you work, you have to run a MIDI-only sequencer alongside the audio software.

Whilst many people achieve this quite successfully, and you are unlikely to have major problems sync'ing the two applications together in theory, there is plenty of scope for timing problems. Judging by the number of people having trouble keeping MIDI and audio together in *Cubase VST* (where everything is under the control of a *single* application), the thought of running two completely separate programs may put some people off. Running two applications also means that you are likely to be constantly weaving and dodging between two sets of windows, which some people find tricky without resorting to a huge monitor screen that allows both application windows to be seen at once.

EXTERNAL HARDWARE

The only case where running separate audio and MIDI applications on a PC causes no problems at all is where dedicated audio hardware runs independently of the PC processor. Soundscape's SSHDR system (latest version reviewed back in *SOS* November '97) and Studio Audio and Video's SADiE are both examples of this professional stand-alone approach. In both cases, the PC is only used to update the screen display and send the occasional command to the free-running hardware, so that the bulk of the PC's processing power is still available to synchronise a MIDI sequencer if required. This sort of professional self-contained audio system is recommended to those who would prefer not to rely on the power of their PC's processor for audio. However, I consider such systems beyond the scope of this roundup; the multi-channel PC soundcards included this month all rely significantly on the processing power of the PC, whether or not they help it out by providing on-board effects.

THE ALL-IN-ONE APPROACH

To ensure maximum compatibility and a minimum of problems, many manufacturers provide a complete hardware *and* software system to handle audio recording and editing. This is sensible, given the problems that PC musicians can encounter getting certain combinations of audio hardware and software to work together. However, this approach does rely on the manufacturer getting the audio software right from day one. These complete packages have the advantage that the software component knows exactly what the hardware is, and can be optimised accordingly, but if you buy a complete proprietary system, you are then tied to the support provided by that manufacturer, and are reliant on them to continue adding support for other features not present in the initial release. If you need MIDI support, you also need to make sure that your sequencer of choice can be successfully synchronised to the proprietary audio software.

Sadly, all too often, as companies rush to recoup their large initial investment and suffer the pressures of setting up hardware production lines, enthusiastic marketing people pressurise the R&D departments into releasing software before it is truly ready. Although the bulk of the functions may work, early purchasers often find 'greyed out' menu items (indicating functions that have yet to be implemented) or help files littered with promises that certain vital features will be included in the next free update.

SIDE BY SIDE

If you'd rather not synchronise separate audio and MIDI applications, you can of course opt for one piece of software that combines the two functions (a MIDI + Audio sequencer) and add another company's multitrack audio I/O hardware to give you extra facilities, as well as potentially taking a significant load off your PC processor. However, this approach also requires care. Although some I/O hardware is designed to integrate well with a particular MIDI + Audio sequencer (for example Emagic's *Logic Audio* with their own Audiowerk8 hardware, and Steinberg's *Cubase VST* with the forthcoming Lexicon Studio System), many other systems only currently provide access to advanced audio handling features (such as on-board EQ and effects) when the hardware is used with the company's own proprietary audio software. Ensoniq's PARIS (reviewed in *SOS* January '98) is, at the moment, a completely closed system; audio can only be dealt with using the supplied software. DAL's V8 system [reviewed on page 132 of this issue] does have some audio support in *Cakewalk Pro Audio 6*, but you cannot currently access any of the EQ or effects unless you use the supplied *MxTrax* software for audio recording at an additional £500 (although this situation will probably change as third parties provide other software support). This is often the case — if the hardware is capable of exotic features, you usually need special (often proprietary) software to access them.

As a result, anyone wanting to expand into the world of multi-channel cards who is determined to stick with an *existing* MIDI + Audio sequencer will find more 'open' soundcard hardware better suited to their needs, at the expense of some of the specialised features. Event's range of multi-channel cards, for example (Darla, Gina and Layla) provide an extremely open approach, which makes it very easy to use them with most MIDI + Audio sequencers, but there are no special effects on board the cards (although these are mooted for a future driver release which will run specifically with *Cubase VST*). In general, unless the soundcard specifically claims compatibility with your chosen MIDI + Audio sequencer, you should tread very carefully.

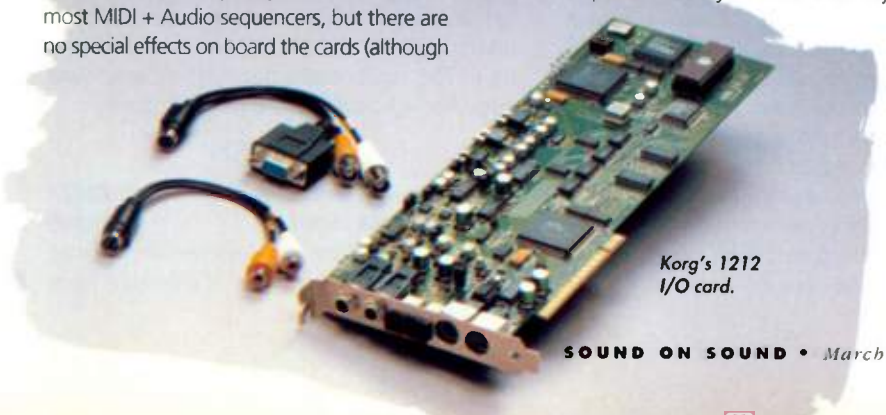
OTHER SOLUTIONS

Since so many 'closed' systems have limited compatibility with a large number of MIDI + Audio sequencers, it would be extremely useful if some manufacturers provided utility mixer software that at least allowed you to change soundcard EQ and effect settings from a separate application window (much as most of us do with synth editors already), so that you could carry on with your favourite sequencer without missing out on the juicy bits. Some soundcard manufacturers are already working closely with MIDI + Audio sequencer developers to add more specific support along these lines in the future, and the current situation for specific combinations of soundcard and MIDI + Audio sequencer may well change as new drivers are developed. I will try to keep you informed of such changes in the PC Notes column, although the Internet is also a good place to keep abreast of the latest developments.

In general, any card that includes MME driver software can be accessed from any Windows 95 MIDI + Audio sequencer, and this support includes any digital inputs and outputs (see the 'Digital I/O' box elsewhere in this article). If the entry in the table at the end of this article reads 'Multi', then all audio channels can be accessed as multiple pairs of stereo drivers. The 'Stereo' entry for the Emagic Audiowerk8 card is because only a single stereo pair of tracks can be accessed from standard Windows 95 software.

THE FINAL CHOICE

Many of these systems can be expanded at a later date, although sometimes this may mean adding another soundcard running in sync, which may cause you difficulties if your PC is already well populated with expansion cards. Running multiple soundcards (along with the separate sets of drivers required for each) may indeed be possible, but watch out for any warnings of potential long-term timing drift between MIDI data and your digital audio, and check that you still have enough PC resources to cope. Some cards offer single drivers that can run several cards, and these will be much easier to set up, but buying a card with sufficient channels in the first place is always a safer bet. Try ▶



Korg's 1212 I/O card.

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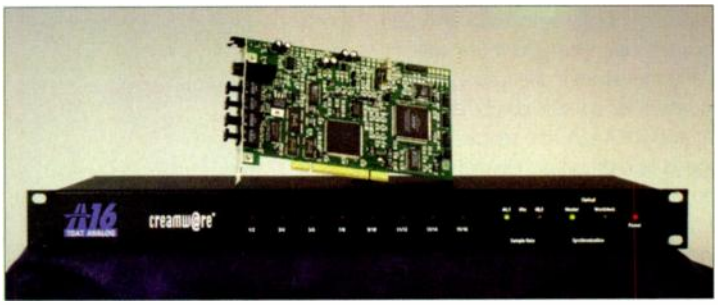
to anticipate future requirements, rather than attempting to expand on an *ad hoc* basis, and you shouldn't go far wrong.

The entries shown as expandable systems in the table at the end of this article are those that have a powerful engine on the soundcard that already supports more I/O channels than initially supplied with the package, and which can be expanded by plugging in additional converters or interfaces. One thing to watch out for with manufacturers' specs is that complete software/hardware systems often quote the maximum number of output channels, but fail to mention that these are actually mixed in software or hardware before emerging via a single stereo hardware output. Since this can also be done by a standard stereo card with a package like *Cubase VST*, I have tried to compare like with like by giving figures in the table for hardware I/O outputs, so that you can see just how many separate sockets there will be.



Creamware's TDAT 16.

On the input side, many people only need to record a maximum of a single mono or stereo performance at once, so two input channels may be quite sufficient. If you ever envisage a time when you will need to record several musicians simultaneously onto discrete channels, or record a multi-miked drumkit, then you will require more simultaneous inputs. At the multi-channel level, digital I/O is a must for many people, as it allows you, at the very least, to transfer your recording to other media, such as DAT, without loss of quality, as well as affording you the possibility of adding more exotic digital outboard devices later. However, you can still back up your recordings to removable-cartridge hard drives, or burn direct to CD-R, without exiting the digital domain, so S/PDIF or AES/EBU digital I/O may not be a necessity for everyone.

ADB

Multi!Wav Digital PRO24 **£499**

The AdB range is distributed in the UK by Et Cetera, who seem to handle everybody except the Spice Girls. This card aims for ultimate audio quality by providing a full 24-bit audio transfer path and shielded audio transformers, as well as an option to upgrade to 96kHz operation. It is one of several cards that basically provide digital I/O facilities, along with a single D/A converter for monitoring purposes, rather than a full-blown recording and playback system. This is ideal for those who prefer to have their A/D conversion work done outside the PC, using a DAT recorder or stand-alone converter box. AES/EBU, optical and co-axial formats are supported, as is word clock. A special Quad output mode lets you separate the analogue and digital outputs for 2-In/4-Out capability. Real-time digital format conversion is also supported, from optical to co-axial, or S/PDIF to AES/EBU (or *vice versa*). The card comes bundled with Steinberg's *WaveLab SE*, which supports full 24-bit digital editing, as well a modified version of Sonic Foundry's *Sound Forge XP*. If you want a professional card with lots of digital options, but only need stereo analogue monitoring facilities, this should be on your shortlist.

CREAMWARE

MasterPort **£599**
TripleDAT **£1290**
TDAT 16 **£1695**

Creamware products are distributed by System Solutions, whose Atari support has an excellent pedigree. Strictly speaking, both the MasterPort and TripleDAT cards should have been included in last month's stereo card roundup, but they end up here since they are advertised as 4-In/4-Out devices. In fact, these four channels consist of a single stereo in and out, and a single stereo digital in and out. They are both complete solutions, since they come with software, and the actual soundcard is identical in both systems. The first, the less expensive MasterPort system, provides real-time 4-band parametric EQ, as well as many off-line effects such as compression, limiting, expansion, delay, and pitch-shifting. MIDI users will have to sync up a sequencer to run alongside the proprietary software, but MME drivers are also provided, so you can run any MIDI + Audio sequencers. TripleDAT is an altogether more comprehensive system intended for mastering applications, with integrated CD-writing software also included as part of the suite. In addition, up to 256 software channels are available, as opposed to the 16 of the MasterPort.

Since both systems use the same card, there is an upgrade path for MasterPort owners to the full TripleDAT package. It is also likely that the hardware may become available by itself for anyone solely interested in running an existing MIDI + Audio sequencer.

The third Creamware system, TDAT16, is a 16-channel PCI solution, and each of the two digital optical I/Os can be switched between S/PDIF and ADAT format. In ADAT format the full 16 channels are available, and you could either connect an ADAT machine or an D/A converter box to either connector (Creamware have the A8 and A16 D/A rack boxes in their range). The onboard DSP provides real-time sample rate conversion as well as a wide range of real-time effects, and the supplied software allows up to 256 virtual audio tracks. The Creamware range has a good reputation for audio quality.

DIGIDESIGN

Session 8 + 882 Interface **£2677**
Session 8 + 888 Interface **£3840**

The Session 8 system was reviewed in *SOS* way back in July 1993, and is still available from

DIFFERENT FLAVOURS OF ZEROES & ONES — DIGITAL I/O

When it comes to digital I/O, there are several standards. The consumer S/PDIF variety (Sony/Philips Digital InterFace) is either optical (aka Toslink, mentioned last month) or electrical (aka co-axial, using phono sockets), and each socket can support a single stereo channel at up to 24-bit resolution. The more professional AES/EBU format is also electrical, but at higher voltage levels. A more advanced optical solution comes in the form of the ADAT optical I/O, which sends eight channels of digital audio down a single optical cable, and this format is ideal if you already have ADAT machines (or other hardware which can operate via this interface, such as Korg's 1212 I/O card and 168RC digital mixer, or Alesis' Q2 effects processor) and want to master on a hard disk recording system. TDIF (Tascam Digital Interface Format) is another 8-channel standard, used by the Tascam DA family of stand-alone digital recorders (DA88, DA38, and DA90), and uses a single 25-pin D-type connector for input and output signals.

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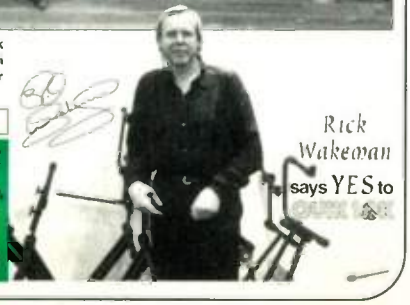

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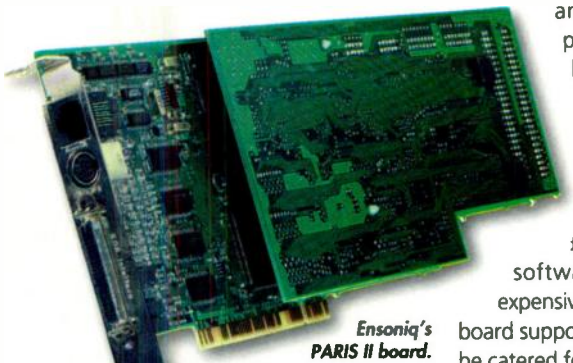
> "...if the hardware is capable of exotic features, you usually need special (often proprietary) software to access them."

Digidesign, whose Pro Tools systems for the Mac are an industry standard. Both of the Session 8 systems quoted here provide eight channels of analogue inputs and outputs, but the more expensive 888 Interface has more extensive digital I/O, with an extra four AES/EBU In/Outs in addition to the single S/PDIF provided by the 882 interface. The Session 8 hardware consists of two ISA cards, and the supplied software provides access to the on-board parametric EQ, as well as Level and Pan automation. Integration with existing sequencers was well catered for by Steinberg's *Cubase*, but only in its XT version, and this software has now been superseded by *Cubase VST*. Still, Digidesign have been hinting at developments recently that may yet put this system back in the running — watch this space!

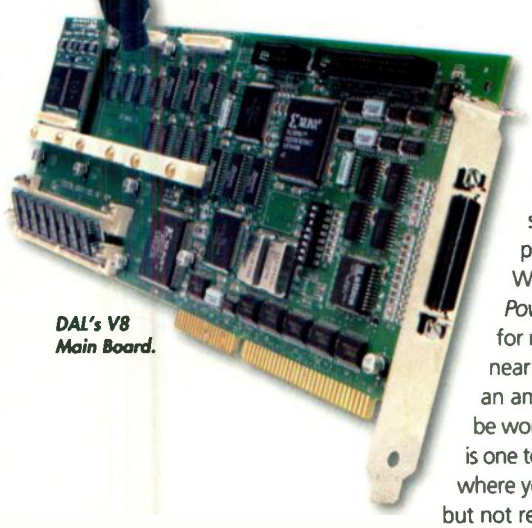
DIGITAL AUDIO LABS

CardD+ Digital I/O **£249**
Digital only CardD **£299**
V8 **£3700**

The CardD+ was covered in last month's stereo card roundup, but there is a digital only add-on card available for this (the I/O version), as well as a stand-alone digital-only CardD. For many people, this has proved the ideal quality stand-alone solution for several years, although DAL's cards have a reputation for sometimes being difficult to install. However, once sorted, there are no problems with audio quality, although this range is beginning to look a bit long in the tooth nowadays.



Ensoniq's PARIS II board.



DAL's V8 Main Board.

The V8 system is an extremely ambitious expandable hardware package, which in the package quoted here provides eight analogue Ins and eight analogue Outs, as well as AES/EBU, co-axial and optical digital I/O (the quoted system price above, by the way, is reached by totting up the following: V8 Main Board, £1499; Big Block £1699, *MxTrax* software £499). While this might seem expensive for an 8-track system, the V8 main board supports 16 Ins and Outs, which may either be catered for by an additional Big Block, or by an ADAT interface at £549. There is enough DSP capability on the Main Board to provide extensive EQ and effect options, which currently can only be accessed through the custom-written *MxTrax* software (a package rather like the one supplied with the Ensoniq PARIS system). However, basic support is provided by *Cakewalk Pro Audio 6*, and Waves have ported a version of their *Native Power Pack* for V8 use. DAL are also hoping for more extensive third-party support in the near future. An ISA buss card doing all this is an ambitious prospect, and DAL will probably be working on a PCI version at some stage. This is one to see demonstrated as a complete system, where you can see it being run through its paces, but not really a DIY solution.

EMAGIC

Audiowerk8 **£499**

I'm sure everyone has heard of this card, but its idiosyncrasies bear repeating. This was one of the first PCI 8-channel cards to appear, and as it is manufactured by the same company responsible for *Logic Audio*, it integrates seamlessly with that application, providing a system that would ideally suit those weaned on the *Logic* range. However, months after its launch, there is still only a Beta version of a standard Windows 95 driver available, and this only gives access to a very basic single stereo pair of channels, making the Audiowerk8 totally unsuitable at the present time for any other MIDI + Audio package. There are eight analogue outputs, and a stereo input, along with co-axial digital I/O. Recently, a new package bundled with *Logic Audio Discovery v3.0* called the Audiowerk8 Home Studio Kit has been launched, and for a limited time this is priced at £499. If you like *Logic Audio*, this is the card for you. If not, don't even think about it unless a full driver emerges.

ENSONIQ

Ensoniq PARIS I **£2199**
Ensoniq PARIS II **£2499**
Ensoniq PARIS II **£2849**

The PARIS II system was reviewed in the January issue of *SOS*, and is impressive from the hardware standpoint, featuring a control interface with faders and knobs, and a range of analogue interface solutions, from a basic 2-In/4-Out box (PARIS I) to the expandable rackmounting cage of the PARIS III that accepts a variety of I/O options. The card supports up to 24 simultaneous digital audio data streams at 24-bit resolution, and any combination of 16 simultaneous tracks split between recording and playback.

The software looks very nice, but provides no MIDI support; you have to run a sequencer alongside for this. The initial software release is not quite complete, with some options greyed out, and there are irritating deviations from standard operating system methods, particularly in the Mac version. However, the crowning glory is a six-DSP implementation of the Ensoniq DP/Pro effects unit. Once the software is further polished, this is a system that will suit those who primarily want audio recording, and are not worried by the prospect of no integrated MIDI support.

EVENT

Darla **£299**
Gina **£499**
Layla **£899**

Of the three cards in this range, Darla and Gina have been available since late 1997, with the long-awaited Layla due for release by the time you read this. All feature at least eight analogue outputs: Gina and Darla have their D/A converters on the soundcard itself; Gina uses a breakout box with quarter-inch jack sockets, at the far end of a 1-metre shielded audio cable, and Darla has a

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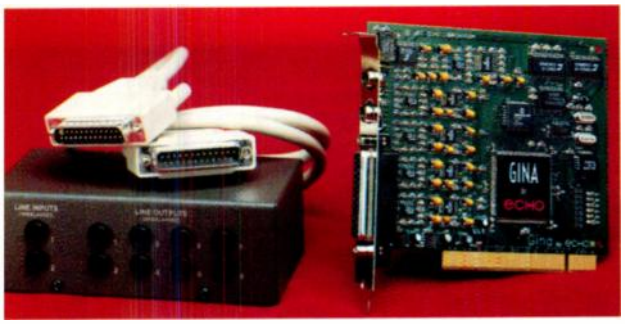

Event's Gina.

small plug-in box with phono sockets attached to the card itself. All three have excellent audio quality. Darla is analogue-only, but Gina adds an S/PDIF digital I/O socket pair. Layla houses its converters in a rackmounting case, and also has word clock I/O, as well as an additional two outputs for Left and Right Monitor duty (10 in all), eight inputs, and a single In/Out/Thru MIDI interface on board. It also features balanced or unbalanced audio I/O which is switchable between +4/-10 levels.

FRONTIER DESIGN

Frontier Design WaveCenter **£498**

The WaveCenter is marketed as a low-cost digital 8-In/8-Out card, which makes it suitable for those who need to record whole bands (or a fully miked-up drumkit, for that matter). A versatile option exists, which allows the optical input and output to function in either stereo S/PDIF or 8-channel ADAT format, along with a pair of phono sockets supporting electrical digital I/O (see 'Different Flavours of Zeroes & Ones' box for more details on electrical digital I/O). A single MIDI input and three independent MIDI outputs are also available.

This is an ideal solution for those who want to interface an ADAT (or ADAT XT) to a MIDI + Audio sequencer. In this case, you will already have converters in the ADAT for analogue monitoring, but for more general-purpose applications you will need to add an external converter box. Compatibility is claimed with all digital audio software applications.

KORG

1212 **£599**

Korg are quietly getting some solid support for the 1212, and its *Cubase VST* ASIO drivers are the first to be released for the PC from any manufacturer. Although it only provides a single stereo analogue I/O (for monitoring), the most interesting feature is the ADAT digital optical I/O, which provides a further eight channels of inputs and outputs, and a further co-axial S/PDIF I/O, adding up to the 12 Ins and 12 Outs of its name. A 9-pin ADAT sync connector is also provided for full synchronised ADAT editing inside *Cubase VST* (complete with chase lock), and word clock I/O. It is possible to run two or three cards in one PC if 24- or 36-channel I/O is required. If you don't use ADATs in the studio, external rackmounting converters are available: the 880A/D and 880D/A provide eight of the appropriate 20-bit converters.

GADGET LABS

Wave/4 **£299**

The Wave/4 is not the cheapest 4-In/4-Out card (that privilege is held by Midiman's Dman2044), but at only £50 more, it does include a 1-In/1-Out MIDI interface, and a daughterboard socket for smaller WaveBlaster-compatible cards, but not the larger ones such as Yamaha's DB50XG. If you want multiple analogue channels, but don't need digital I/O, this could be just the job.

LEXICON

Lexicon Studio System **£2799**

This is yet another system that has people drooling in advance — the latest word on official release dates puts the on-sale date sometime this month (March '98). The Studio System's main claim to fame is that its DSPs run an official software version of the famed Lexicon PCM90 reverb. However, the Studio will also bypass any potential problems associated with running proprietary hard disk recording software, by being designed from the start to integrate with *Cubase VST*. I suspect that this will greatly add to its appeal, since *VST* is already extremely popular, and any hardware support it gets will allow it to achieve more real-time channels and effects.

The so-called Core32 system card allows up to 32 channels of I/O, and the LDI-12T interface is a rackmounting box containing 12 channels of simultaneous I/O, which consists of stereo analogue, 8-channel ADAT, and S/PDIF optical/co-axial. The best bit is the PC90 daughterboard, which clips onto the Core32 to provide two discrete Lexicon reverbs using exactly the same architecture as the award-winning PCM90. ASIO drivers for *Cubase VST* (both Mac and PC) are very close to completion. This promises to provide true hardware support for an established industry standard MIDI + Audio sequencer, and ought to result in huge sales.

MIDIMAN

Dman 2044 **£249**
Midiman DiO **£249**

The DMan 2044 is the cheapest card of the 4-channel variety, and you can pay more for many stereo cards. It provides four Ins and four Outs from a breakout box with quarter-inch jack sockets, and the converters are of the seemingly now standard 20-bit, 128x oversampling type. An onboard DSP provides reverb and chorus, and there is compatibility with all audio software packages. All it lacks is a digital I/O facility, and this is catered for separately by the so-called DiO, which provides both AES/EBU and co-axial sockets, and a DSP which ensures minimal overhead on your main PC processor.

SEKD

Arc44 **£478**
Prodif24 **£330**
Prodif32 **£330**
Prodif Gold **£352**
Prodif96 **£626**
Arc88 **£745**
Arc88 ADAT **£923**

With such a comprehensive range, thankfully the names say it all. The Arc44 provides a 4-In/4-Out analogue solution (using quarter-inch audio jacks), for those who don't need digital support. The

A BIT OF EVERYTHING

All soundcards will record with 16 bits (which fills about 5Mb of hard disk space per channel minute). A few cards allow 20-bit recording, and occasionally even 24-bit, but both these bit depths will need three bytes of hard disk space to store a single point on the waveform, rather than the two needed to store a 16-bit value. This immediately expands the hard disk space used by 50% in both cases, and your hard drive will be being called upon to work 50% harder as well. If you aspire to greater than 16-bit recording, talk to a specialist dealer, as you are likely to need professional support.

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▶ Arc88 extends analogue to eight Ins and eight Outs, connected via a breakout cable to a bank of phono sockets, along with a single optical S/PDIF In/Out. Multiple card support is available, and sync between cards is achieved using an internal patch cable. Both cards are provided with Windows 95 drivers that allow all channels to be accessed as multiple stereo pairs. The Arc88 ADAT also provides an 8-channel optical digital I/O.

"If you aspire to greater than 16-bit recording, talk to a specialist dealer."

If you aspire to more than 16 bits, the Prodif24 will allow you to record and play back at up to 24-bit resolution. Both AES/EBU (on quarter-inch stereo jacks!) and S/PDIF (optical Toslink) formats are provided. The output can be monitored through an 18-bit D/A converter, and once again any Windows audio application can be used, although there are only a few, such as *WaveLab*, that currently support the full 24-bit resolution. The Prodif32 still operates at 16, 20, or 24 bits, but also allows a high-speed 32-bit transfer mode that is less hardware-intensive than the 3-byte 24-bit transfer mode. It also removes the analogue monitoring, leaving it at the same price as the Prodif24. The Prodif Gold is also a digital-only card, but can either operate as a stereo I/O, or switch to 8-channel ADAT mode. This sort of spec may be ideal for those with ADATs who wish to edit inside the *Cubase VST* environment. The Prodif96 is a high-end version of the Prodif32 that further extends the 24-bit signal to a maximum sample rate of 96kHz (64 and 88.2kHz are also supported).

ZEFIRO ACOUSTICS

ZA2 **£399**

Zefiro have got a very good reputation for audio quality, and the ZA2 can also perform some nifty tricks courtesy of its 24-bit DSP. Real-time sample rate conversion is possible, and for many people this can be a vital part of the recording process, especially if they regularly master other musicians' DAT tapes, either back to another DAT tape or straight to CD-R. Any rate from 5kHz to 60kHz at 8, 16, or 20 bits can be handled. Other DSP functions include decoding of MPEG audio and EQ. Digital I/O is AES/EBU, optical and co-axial, and all three can be used simultaneously, effectively giving you a mini digital patchbay. A single 16-bit stereo analogue output is also provided for monitoring, but there is no analogue recording capability — this card is intended mainly for digital use. Two cards can be locked together for 4-track work if required. SOS

MANUFACTURER	MODEL	PRICE	NUMBER OF ANALOGUE OUTPUTS	NUMBER OF ANALOGUE INPUTS	CARD TYPE	A/D & D/A CONVERTERS
TWO CHANNELS						
Korg	1212	£599	2	2	PCI	20-bit delta-sigma A/D, 18-bit D/A
Creamware	Masterport	£599	2	2	ISA	18-bit 128x
Creamware	TripleDAT	£1249	2	2	ISA	18-bit 128x
FOUR CHANNELS						
Midiman	DMan 2044	£249	4	4	ISA	20-bit 128x
Gadget Labs	Wave/4	£299	4	4	ISA	A/D 16-bit 64x, D/A 18-bit 128x
SEKD	Arc44	£478	4	4	ISA	16-bit
EIGHT OR MORE CHANNELS						
Digidesign	Session 8 + 882 I/O	£2677	8	8	ISA	16-bit
Digidesign	Session 8 + 888 I/O	£3840	8	8	ISA	16-bit
Emagic	Audiowerk8	£499	8	2	PCI	18-bit equivalent
Event	Darla	£299	8	2	PCI	20-bit 128x
Event	Gina	£499	8	2	PCI	20-bit 128x
Event	Layla	£899	10	8	PCI	20-bit 128x
SEKD	Arc88	£745	8	8	PCI	16-bit 64x
SEKD	Arc88 ADAT	£923	8	8	PCI	16-bit 64x
EXPANDABLE SYSTEMS						
Ensoniq	PARIS I	£2199	2	2	PCI	20-bit 128x
Ensoniq	PARIS II	£2499	4	4	PCI	20-bit 128x
Lexicon	Studio System	£2799	2	2	PCI	24-bit
Ensoniq	PARIS III	£2849	4	4	PCI	20-bit 128x
DAL	V8	£3700	8	8	ISA	16-bit delta-sigma
DIGITAL ONLY						
Midiman	DIO	£249	–	–	ISA	–
Frontier	WaveCenter	£498	–	–	ISA	–
SEKD	Prodif24	£330	2	–	ISA	18-bit
SEKD	Prodif32	£330	–	–	PCI	–
SEKD	Prodif Gold	£352	–	–	PCI	–
SEKD	Prodif96	£626	2	–	PCI	20-bit
Zefiro	ZA2	£399	2	–	ISA	16
AdB	Multi!Wav Digital Pro 24	£499	2	–	ISA	18-bit
Creamware	TDAT16	£1695	2	–	PCI	–

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DIGITAL I/O	DSP EFFECTS	MIDI I/O	WINDOWS 95 MME SUPPORT	PROPRIETARY AUDIO SOFTWARE	*SOS* REVIEW
ADAT, co-axial	No	No	Multi	No	Jul 97
Optical, co-axial, (AES/EBU optional extra)	Yes	1 In, 1 Out	Multi	Yes	Oct 97
Optical, co-axial, (AES/EBU optional extra)	Yes	1 In, 1 Out	Multi	Yes	Dec 96
No	Yes	No	Multi	No	–
No	No	1 In, 1 Out	Multi	No	–
No	No	No	Multi	No	–
co-axial	Yes	No	Multi	Yes	Jul 93
co-axial, 4 AES/EBU	Yes	No	Multi	Yes	Jul 93
co-axial	No	No	Stereo	Yes	Jul 97
No	No	No	Multi	No	Not yet
co-axial	No	No	Multi	No	Dec 97
co-axial, word clock	No	1 In, 1 Out	Multi	No	Not yet
optical	No	No	Multi	No	–
ADAT, optical	No	Yes	Multi	No	–
No	Yes	No	No	Yes	Not yet
co-axial, word clock	Yes	No	No	Yes	Jan 98
ADAT, co-axial, optical	Yes	No	Multi	No	Not yet
co-axial, word clock	Yes	No	No	Yes	Not yet
AES/EBU, co-axial, optical	Yes	No	Multi	Yes	Mar 98
AES/EBU, co-axial	No	No	Yes	No	–
ADAT, optical, co-axial	No	1 In, 3 out	Multi	No	–
AES/EBU, optical	No	No	Multi	No	–
AES/EBU, optical, co-axial	No	No	Multi	No	–
ADAT, AES/EBU, optical, co-axial	No	No	Multi	No	–
AES/EBU, optical, co-axial	No	No	Multi	No	–
AES/EBU, optical, co-axial	Yes	No	Multi	No	–
AES/EBU, optical, co-axial, word clock	No	No	Multi	No	–
2 ADAT/optical	Yes	No	Multi	Yes	Feb 98

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Making Arrangements

A ROUGH GUIDE TO SONG CONSTRUCTION AND ARRANGEMENT

PART 4: This month, BIG GEORGE persuades more famous musicians and arrangers to give you the benefit of their hard-won wisdom.

DEBBIE WISEMAN

Apart from being one of Great Britain's top film composers (see interview starting on page 152 of this issue), Debbie Wiseman also does all her own arrangements and orchestrations. She spared me a nanosecond of her time to explain a few of the arrangement techniques she used while she was scoring the forthcoming film Tom's Midnight Garden.

"I tend to orchestrate as I go; there's no point in writing something high and frivolous for a cello which will eventually be played by a piccolo. Planning out what different members of an orchestra are going to play is similar to picking a football team. It's no good having a centre-forward playing in goal, but sometimes you do want a defender to make an attacking run.

"It's most important that every single line you write for a section should be a workable line in its own right. The strings are the heart of any orchestra — a perfect section would comprise 16 first violins, 14 second violins, 10 violas, eight celli, and six double basses. If you use a smaller section you have to be careful, as every little intonation and bowing shift will be more exposed. The more strings you have, the richer the texture, and the more expressive you can be harmonically. A section of eight first violins, six second violins, four violas, four celli and two double basses is a big enough canvas to work with to achieve a fully symphonic depth to the sound, but you will have to tailor the harmonies so as not to leave any part exposed. If I'm writing primarily for a string ensemble, I might start with the melody played by the first violins, followed by the melody accompaniment played by celli and the basses. I don't tend to double the celli and the basses together very often, as that can make the texture sound heavy and lumpy. I have the basses coming in and out to emphasise different passages, either playing arco or pizzicato. As the piece develops, the violas might take on the melody and the second violins' counter-melody might meld into the first violins' figure. The role reversal will be different for every arrangement I do — there really are no hard and fast rules.

Debbie Wiseman.

"Sometimes the strings are there only as a bed for the woodwind. If you only have a small violin section — say, eight players — you can give the sound a real boost by doubling their part with a flute. If you want the flute to take a lead role in the piece, on the other hand, it's important to clear the rest of the orchestra out of its tonal range. Otherwise the sound becomes muddy and indistinct, and you can lose the flute's definition.

"As for developing an arrangement, I'm composing a solo flute piece at the moment, and prior to the cadenza (the flamboyant solo section) I've kept the arrangement quite sparse. Then, at the end of the flute's moment of glory, when it's time to start up the orchestra again, I've eased them in and then voiced the first and second violins in and around the flute's melodic line, to strengthen the figure. I've also included answering passages between different instruments to add an extra element to the arrangement. Oboes and bassoons work well together in this way, as do flutes and clarinets. But the main thing with orchestral arrangements is this: if something is going to happen, like a soaring woodwind line exploding out of a quiet section of the piece, it's worth milking the moment prior to it happening. In other words, keep them waiting.

"I know a lot of composers use orchestrators, but

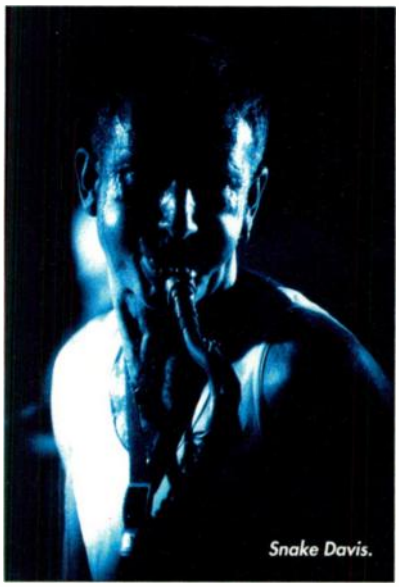
I do it all myself. I find orchestrating goes hand in hand with the actual compositional process. I will write for a specific instrument as I'm composing, rather than sort it out at the end."

SNAKE DAVIS

Chris 'Snake' Davis is about as cool a musician as it's possible to be in Great Britain. Apart from being live musical director for international pop icons M People, his CV reads like a Who's Who of chart-topping turns, from George Michael to the Spice Girls, the Pet Shop Boys to Primal Scream, Mark Morrison to Take That, Sir Paul McCartney to Ray Charles — and so on. As either head of a wind section or the entire section himself, he always leaves a recording session sounding infinitely groovier than it did when he arrived.

But just how does he go about arranging live versions of hits like 'Search For The Hero Inside Yourself' for M People?

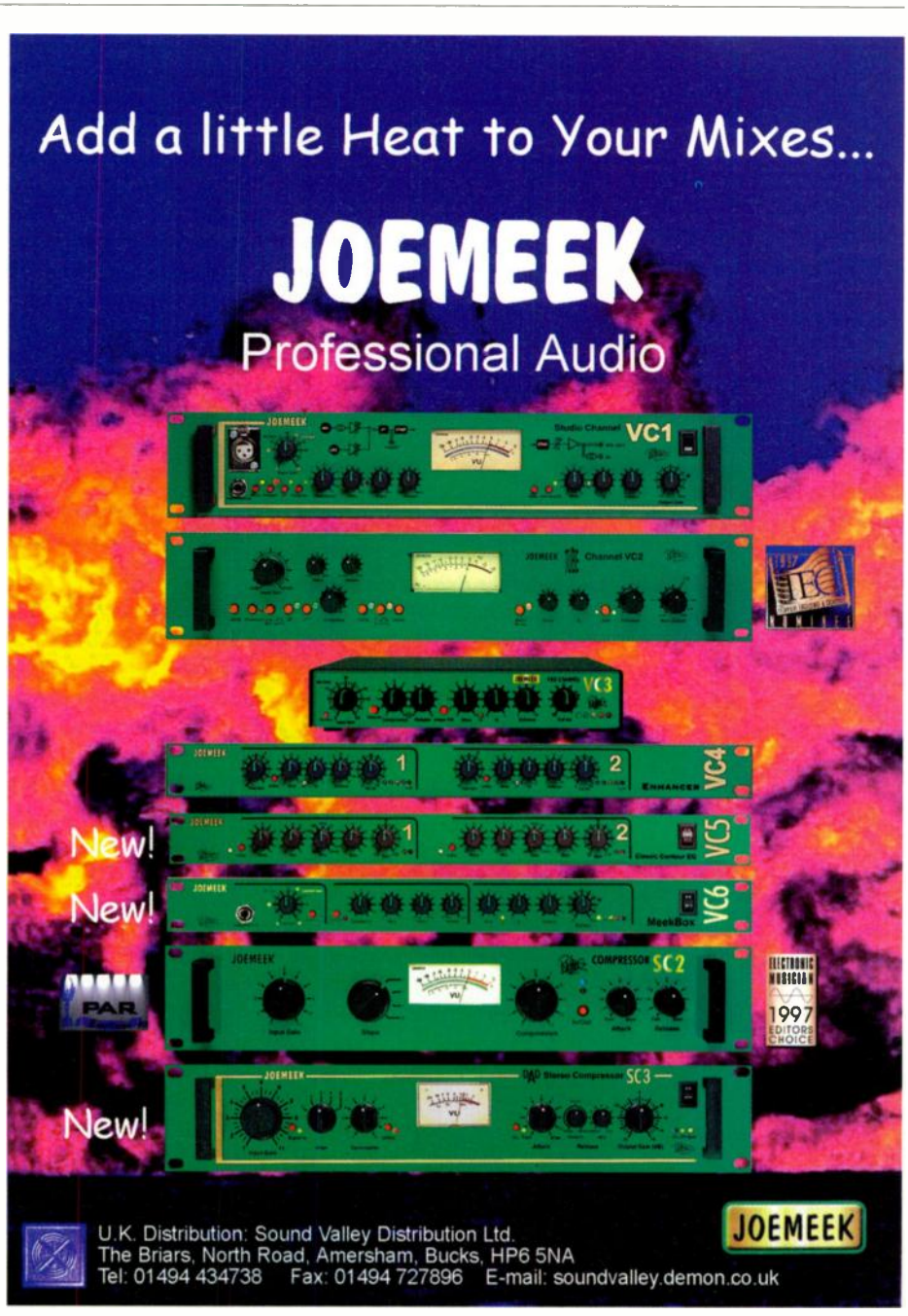
"When we go on tour it's important to give the fans what they want, which is longer, interactive versions of the hits. I'll look for sections that can


Snake Davis.

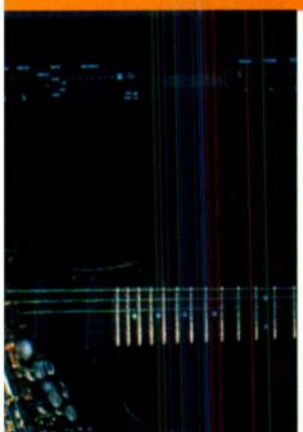
break down, or somewhere we can stick a solo in, that will groove along for a couple of minutes. With 'Hero', in particular, we re-arranged it so that during the chorus the whole band stops, and we get the audience clapping and singing along for 16 bars, then the drummer kicks back in, and then the rest of the band follows. We also changed the dynamics, replacing the snare for a rim-shot for the intro and first verse. It made the chorus thunder in, which gave the song another dimension.

"Typically, endings need to be sorted out, as on records they usually fade out. You can spend bloody ages trying fancy chords and dead stops and intricate little fills, but nothing works better than a nod and everyone stops. At the end of some songs we'll go round the chorus quite a few times, with someone blowing over the top, the audience joins in the singing, and it cooks.

"Rehearsing for tours these days involves a lot of pre-production, just the same as albums do. We'll start with Paul Heard, me and Merv (our programmer), in a room for two or three days getting the structure of the songs together. Then we'll take what we've got into a dingy rehearsal room and work things out with the rhythm section for a week or so. This is for tracks that, on record, might have had a lot of time spent on getting a keyboard bass part and sequenced rhythm together. The bass player and drummer will take it live, as there are loads more options with live players to get a killer groove to evolve, and that's when things start to happen on stage. Live, we use sequencing in a very small way, and if there are things that can't be recreated live we prefer to ▶



Debbie Wiseman:
"If you only have a small violin section, you can give the sound a real boost by doubling their part with a flute."



Pete Thomas.

▶ put them into a sampler so the keyboard player, with the simple push of their index finger, can produce 10 Snake Davises playing the hook. I'll also use my EWI [Akai wind controller] to play large sections live. In truth, it often doesn't hurt to leave out a string section that may have taken a week to record in the studio. I'm a great believer in things being different on stage than on the record. To me it's not a compliment if fans come up afterwards and say, "that sounded just like the record". I prefer it when they say it was different from the record, or better.

"Coming up with fresh arrangements for different tours is something we like to do. On a single like 'Sight For Sore Eyes' there are an extra five remixes which were done by other people, and we'll take elements from them to include in the stage versions. The Brothers In Rhythm remix of 'Open Up Your Heart' was one we particularly liked, so we basically arranged their completely sequenced version for a live band. It also had a two-minute intro which really built up musically before Heather [Small, lead singer] came in singing, which allowed her time to go off and change her dress.

To hear Snake Davis in action, pick up any one of a hundred hit records over the past 10 years. You might even have caught him a few years ago as the sax player on Jonathan Ross's TV show. Alternatively, there's a Snake Davis Band live album called *Reaching Out*, available mail order from Andrea Parker, 50 Oxford Road, Carlton-in-Lindrick, Worksop, Notts S81 9AZ.

PETE THOMAS

Pete Thomas has spent the last 20 years securing his place in history as one of the all-time great British rock drummers, first coming to international prominence as the engine-room for Elvis Costello, from '(I Don't Want To Go To) Chelsea' right up to his latest album All This Useless Beauty. *His career has covered a vast area; he's worked with such artists as Latin kings Los Lobos, Suzanne Vega, Squeeze, Bonnie Raitt, Tom Jones, Sir Paul McCartney, Tasmin Archer, Matthew Sweet and The Waterboys, right up to the latest Bond theme sung by Sheryl Crow.*

His career started long before punk rock, when, after a two-year stint with pub rock legends Chilli Willi and the Red Hot Peppers (while still a teenager) he moved to the West Coast of America to join the country-rock giant John Stewart (best known for writing the Monkees hit 'Daydream Believer'). While out there he learned to play red-hot country guitar, and if he wasn't such a freak for the drums he could probably have made it as a Nashville Picker. Increasingly these days he is called upon for his unique flair for thumping the best out of guitar-strung singer/songwriters.

"The first thing I do when I get to a session is get the artist to play the song to me, all the way through on guitar or piano. I've got a shorthand way of writing the arrangement out, by simply sketching the structure (for example, 4 bars intro/8 bars verse/16 bars chorus, and so on). It only takes me once through the song to write it out, unless there's something I don't understand — then I'll always ask to go over that bit again, for as long as it takes. That's usually enough to get going, but if it's a tricky one, with loads of accents and weird bar lengths, having a shorthand version makes dividing up a sheet of manuscript and writing out the parts in full a hell of a lot easier.

"What often happens with singer/songwriters is that they've got a great song, with great lyrics and perfect chords, but they've only 'sort of' worked out the arrangement, and there are some bits that go all squirmy, so this is the best way for me and them to get to know exactly what happens throughout the tune. So when I start to play the song I've got an accurate map to tell me what's going to happen and when. As for the pattern I'm going to play, I usually get them to mouth the beat they can hear in their heads, or they'll play it on their knees. I don't ever try and get clever with it — if that's what they hear, that's what they'll get. If I'm going to get a bright idea it'll occur as we're playing the track.

"Another thing I do early on is tune my drums to the musical key of the song. If the drums are in tune with all the other instruments, it's going to sound right to begin with. I find it mad when studio engineers try and get a drum sound before they've even heard the song. It's definitely going to change, depending on the pitch I'll tune the toms to and what snare I'm going to use.

"A lot of the time it's just me and the rhythm guitar/singer, maybe a bass and sometimes a keyboard. The main aim is to get the drum track down with all the intensity needed to support whatever the producer might want to pile on top of it later. As long as the drums go down, everything else can be patched up or replaced. But it's best when there's a full complement of players. Then if someone's doing a great solo I'll think, 'How can I lift this part of the song and make it more exciting?'. The ride cymbal is the first place I look to, and if it's a storming performance I'll give the bell end of it a good old whacking.

"Working with Elvis Costello on over a dozen albums and a million tours, I'm used to a singer singing at full tilt every time he opens his mouth, whether it's the first time through a song, or at a sound-check, or a live TV performance in front of an audience of billions. So when I'm recording I like to have the singer doing a guide with all their emotion coming out. That way I can feel where something might need a little push, or alternatively where something needs a bit of space." SOS

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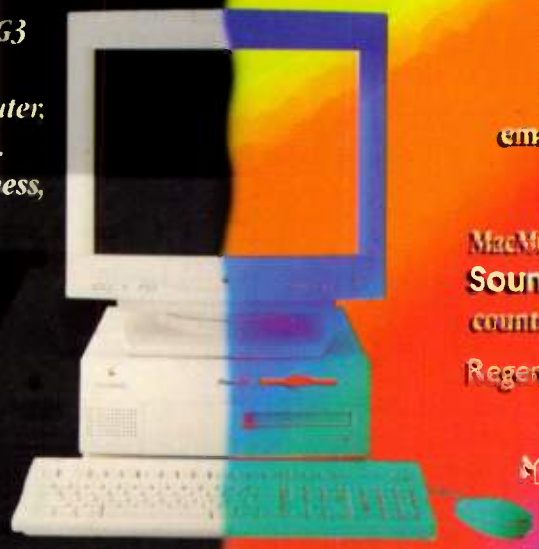

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LITTLE ITALY

VISCOUNT GAMMAVERB REVERB

With their latest super-mini effects processor, Italian manufacturer Viscount goes head to head with the Alesis Nanoverb on looks and the Zoom 1201 on price. TOM FLINT grabs a pizza the action...

The Viscount Gammaverb is an 18-bit/44.1kHz digital signal processor aimed at the entry-level market. In concept, it's closely modelled on the Alesis Nanoverb (reviewed August 1996), and is comparable in size, function and control options. However, the Gammaverb is one of the cheapest effects processors around, joining the Zoom 1201 rack in the sub-£100 bracket, which is good news for anyone on a tight budget. Those needing more flexibility might like to check out the Gammaverb's big brother, the VFX100, which offers a degree of programmability and MIDI control. Gammaverb is a strictly preset-only device with no MIDI control, and unlike the Zoom 1201, with which it obviously competes, is not rackmounting.

THE BOX

On the front panel of the chunky steel case are just five control knobs, the first three of which adjust the input level (monitored by a red clip LED), dry/effect mix and output level. A fourth rotary switch selects the 16 effect types. All the usual reverbs and delays are present, from halls, rooms and plates to flangers, tap delays, and combinations, but there's also the unusual addition of a resonator — more on this later. The final control is another 16-way rotary switch, which accesses variations on each of the basic effects types, giving 256 effects programs in all. A power LED concludes the front-panel tour.

The rear panel has a pair of unbalanced jack sockets for the Left/Mono and Right inputs, plus a further pair to carry the stereo output. As the labelling suggests, mono inputs can be plugged into the left jack socket, which is normalised to the right socket. Last up is the PSU socket, which has a lead clip to discourage accidental disconnection.

THE EFFECTS

All 256 effect variations are fixed, with no other adjustment available other than wet/dry mix. The halls and rooms cover every size of performing space, from a small pub to Earl's Court. 'Virtual' provides specific reverb modelling, ranging from a small cubicle to a large lecture theatre, with damped or reflective walls, while 'Non Linear' supplies reverse and gated settings, with delay times varying from 50 to 200 milliseconds. Some of the gated samples are particularly good when used with rhythm sounds, turning flat drums into a chugging percussive engine. The flanger family also produces some good results, ranging from a slow sweep to a regular pulse.

Chorus/reverb and delay/reverb provide a selection of preset combination effects with both series and parallel routing, combining single examples from the other families. The chorus and delay are also selectable individually from within their own family groups, without the reverb.

Last up are the resonators, which simulate the effect of sympathetic string vibrations. Settings 1 to 12 are each tuned to just one note of the chromatic scale, while the remaining four chromatic variations resonate on all 12 notes at once. These effects successfully emulate the technique of pointing your amp at a piano, putting a brick on the loudness pedal, hanging a mic inside the piano lid and recording — something I've tried doing the hard way before now.

I found the Gammaverb particularly good for treating piano and harpsichord patches, and it offers considerable scope through its more extreme settings. As with other reverb units, turning the mix pot to the full wet mix gives the effect you usually hear on entering the foyer of a concert venue whilst the band sound-check to an empty hall! (A nice Gammaverb patch to use for this effect is Hall 2). The wet setting is particularly effective when used with the vocal patches, producing a swimming pool type of reverb.

THE CONCLUSION

Though this is a budget unit and limited in terms of its processing power, Viscount seem to have succeeded in making the Gammaverb a useful all-rounder in the small studio. I think it's fair to say that some effects are better suited to keyboards than vocals or guitar, but there's plenty of variety. The basic selection of reverbs is good enough for most jobs, but as you'd expect for this price, they're hardly exceptional. However, the resonators, gated reverbs and the more extreme flangers give the Gammaverb a unique quality — though it's still going to be a tough sell against the well equipped and similarly priced Zoom 1201.

There are a few quirks which let the Gammaverb down. For example, the click generated when selecting a new patch is annoying, though the brief delay until the next effect is loaded is to be expected. The omission of a bypass footswitch is less forgivable, as this effectively rules out live use for many musicians. In all other respects, the Viscount Gammaverb is a basic, easy to use, compact effects unit at an attractive price, and the more quirky effects, such as the resonators, are a definite bonus. SOS

pros & cons

VISCOUNT GAMMAVERB £90

pros
- About the size of a cheese sandwich.
- Resonator effect.
- Easy to use, with a wide selection of effects.

cons
- No bypass footswitch or on/off switch.
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summary
A versatile and inexpensive entry-level effects processor that's also very easy to use.

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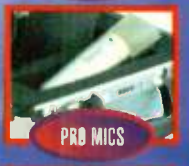

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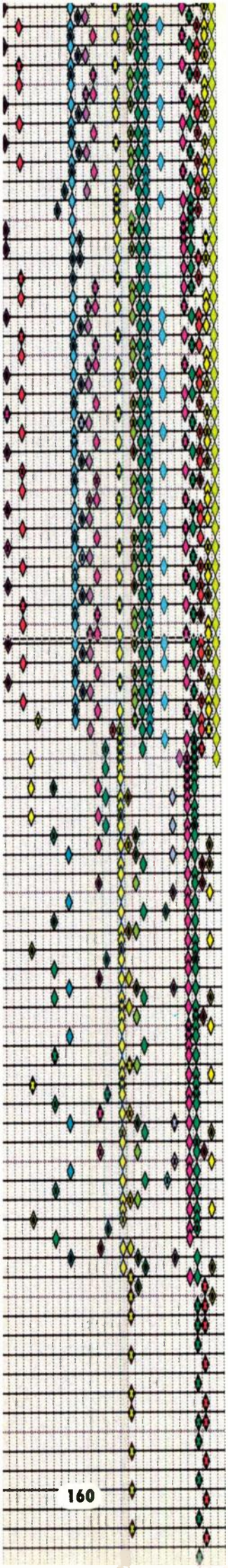

The Rhythm method

EFFECTIVE DRUM PROGRAMMING

PART 2: The debate's been going on for as long as drum machines have been around: can they really sound human? NICHOLAS ROWLAND takes jazz drumming as his test case and tries to find out...

In this month's nail-biting instalment of The Rhythm Method, we're going to investigate various techniques for making programmed patterns sound more 'human', as well as looking at some short cuts to generating rhythm tracks with an apparently improvised feel. While the focus of our attention will be jazz patterns, the subtext is all about injecting the milk of human kindness into beat boxes in general. So even if you think that jazz is something musicians only do when they get too old to play music that people actually want to listen to, stay tuned.

On the face of it, jazz drum programming appears to be a contradiction in terms. Jazz music is supposed to be all about the spontaneous expression of heart and soul, while drum machines and sequencers are soulless machines, the very opposites of spontaneity, creativity and having a good laugh down the boozer after the gig. That was certainly true 10 years ago, when drum machines simply didn't have the technical facilities to compete with humans on a jazz tip. First, the sounds themselves were often not realistic enough to be appropriate for jazz (though, to be fair, this was more an attitude of mind than a valid technical issue). Second, and more importantly, early drum machines just didn't offer the necessary control over dynamics and quantisation which are necessary if you want to emulate the subtle nuances of a live drummer in full flow.

These days, there are no excuses. Armed with the most basic GM module/workstation and the humblest of computer sequencers, you can produce jazz patterns that not only sound convincing, but swing with the best of them. The only real limit to your creativity is your time. Sequencers and drum machines only put out what you put in. If you want to create a rhythm track based around the idea that each bar is different from the next, then you'll have to be prepared to program every single variation yourself. From my own experience, I know it can take many hours to recreate the kind of spontaneous-sounding jazz track that any drummer worth their salt could lay down in a single take. Be prepared.

TO ERR IS HUMAN

One question which is perhaps worth spending a few lines considering is what exactly differentiates a rhythm played by a human from one created by a machine. Setting aside the issue of sounds and ambience for the moment, can most people actually tell the difference between a recording featuring a real drummer and one driven by a beat box? It was probably easier to distinguish in the early days, when a combination of lazy programming and a lack of onboard memory meant that drum machines gave themselves away by undue repetition. The lack of control over dynamics also meant that drum machines really did sound like metronomes — not so much because of the regularity of timing, but because of the total consistency of the sounds. What makes music 'human', on the other hand, is the minor inconsistencies in the playing, in terms of timing, dynamics and the variations inherent in acoustic instruments. There's also this ephemeral notion of 'interpretation' — which can, perhaps, be defined as an ability to creatively bend the rules to enhance the emotional pleasure of the music. Or to put it another way, if it ain't got that swing, it don't mean a thing.

DYNAMIC DUELS

As I mentioned last month, dynamics (the relative MIDI velocity levels of the different instruments) are crucial to creating a sense of movement within any style of drum pattern. Creating convincing jazz patterns requires even more attention to detail in this matter. Obviously, the easiest way to achieve a human feel is simply to program your rhythms in real time, using a velocity-sensitive MIDI keyboard, drum pads or drum machine buttons. I'd recommend this as your standard approach with cymbal parts, which often provide the fluidity of movement within a rhythm. (In jazz, it's the ride cymbal which is the dominant time-keeping instrument, as opposed to the hi-hats). Most sequencers offer a mixture of pattern-based and linear recording, so it's easy enough to build up a basic track from a series of step-time created patterns, then go back and record a new 'live' cymbal line over the entire track. Try also setting the quantise function to a very fine resolution, or turning it off altogether. You can normally go back and correct any really wayward beats after the event, using the over-quantise function.

TIME, GENTLEMEN, TIME

What originally *really* used to get up people's noses about drum machines was the fact that they kept 'inhumanly' strict tempo — a charge which is still levelled at sequenced music *per se*. There are two issues here. One is about variations in tempo across the whole track — in other words, the fact that people naturally speed up and slow down during different bits of a song. There's no reason why sequenced music shouldn't also speed up and slow down, and thanks to the wonder of sequencer tempo maps it's very easy to build this kind of variation into a song. In fact, whatever the style of music, one trick is to nudge the tempo up by a couple of beats when you hit the chorus or playout, and take it down a few notches in the bridge from the introduction to the first verse, or the bridge from the middle eight to the next verse, and so on.

The second issue concerns the minuscule variations in timing that occur within a pattern. Here we're touching on a human foible known in drumming circles as playing behind or in front of the beat. The fact is that the majority of human drummers (and, for that matter, most other musicians) rarely hit the notes right on the button. Some will have a natural inclination to play slightly early, others will play slightly late; some can go back and forth as the music demands. Playing behind the beat will drag the song back and make the track sound slightly slower than it actually is. You notice this in a lot of slow blues and funk numbers, where often the whole band hits everything slightly late. Playing ahead of the beat gives the song real urgency, making it sound faster even though the tempo hasn't actually changed. Again, this is easily replicated on most sequencers (and some drum machines), which allow you to shift patterns or entire drum tracks by a specified number of MIDI ticks. It's worth experimenting with this function, particularly on the snare when you've got a regular beat on the two and the four. But don't overdo it, or your drummer will just sound out of time.

> "...thanks to cut and paste, you can quickly generate drum tracks which have an apparently improvised feel."

Some sequencers and drum machines take this a stage further, with intelligent quantise functions which alter the MIDI velocity of certain beats, while also shifting the timing of certain beats by tiny amounts. But whereas early applications of this function imposed the changes randomly, it's now based on more careful analysis of the rhythmic pulse of particular styles of music. Personally, I think these functions work best when they're applied sparingly — for example, to a fill or particular drum phrase rather than across the entire track. (See the examples box for further discussion of this.) Otherwise the drumming just sounds wrong rather than 'human'.

TIMBRE LAND

As most people are aware, an acoustic drum doesn't just get louder when it's struck harder, it also changes timbre, rising in pitch and exhibiting more pitch-bend. Cymbals will also change timbre according to where they are struck on their surface, and also how rapidly they are played. Some drum machines and sound modules simulate this through multi-sampled voices which will change according to MIDI velocity. If a sampler is the source of your drum voices, you can also easily set up velocity-sensitive cross-fades between different pitches of the same sound or, indeed, different sounds.

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A similar effect can be achieved with more humble equipment. For example, the standard GM kit offers a choice of two ride cymbals, plus a more 'clangy'-sounding ride 'bell'. As a matter of course, I would use at least two of these sounds within a jazz ride pattern, if not all three. It really does make a difference. Similarly, when programming two bass drum notes in quick succession, try using a softer, more rounded one for the first beat and a sharper, heavier sound for the second.

RANDOMISATION

So far, so good. But while technology may be on our side in terms of making individual patterns sound more human, I appreciate that not everyone has the time and patience to laboriously trawl through a drum track beat by beat, instrument by instrument, tinkering about with individual velocities, timing values and so on. However, thanks to the power of cut and paste, you can quickly generate drum tracks which have an apparently improvised feel.

The process starts with the creation of a 1- or 2-bar 'master' pattern. With a jazz track it might be the archetypal jazz cymbal rhythm, underpinned by a basic bass and snare figure. This is then copied to several pattern locations — an easy enough job whether you're using a stand-alone drum machine or a computer-based sequencer. You then call up one of these copies and start deleting, adding or moving a couple of cymbal beats here, a couple of snares or basses there. Maybe just delete every fifth cymbal note — whatever. The trick is not to think too hard about what you're doing, and for this reason I often work in step time, because then it's hard to second-guess the end result. What you should end up with is a family of 1-bar patterns, all based around the master rhythm, yet each one slightly different. When chaining these together to form the song,

JAZZ AGE: THE EXAMPLES

Your starter for 10 is a cluster of four jazz patterns based around the archetypal jazz cymbal pattern. In rhythmic terms there's nothing to blow your socks off. What I'm more interested in here is illustrating some of the techniques explained in the main article. Before we get into that, though, some basic house rules: whereas rock and pop rhythms are based on even-length notes, jazz rhythms are divided into uneven sections based on combinations of quavers, dotted quavers and semi-quavers.

The archetypal jazz hi-hat/cymbal rhythm (you'll know it when you hear it, honest) is based on a quaver/dotted quaver/semi-quaver combination. However, this is played with a triplet feel, so in programming terms it's easiest to program in triplets. So the patterns this month were all created using a quantise value of 8th-note triplets (that is, 12 steps to the bar.) You'll see that a few examples actually use 16th-note triplets, but for the sake of making the grids easy to understand, I've kept the grids quantised at 12 steps to the bar.

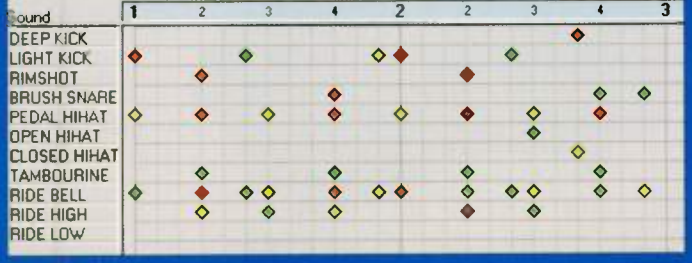
Last month we had three dynamic levels, but this month I've used four. And instead of giving them absolute MIDI velocity values, I've suggested a range of dynamic levels to play with. Ideally, you would tweak each beat/instrument, so that no consecutive values are the same. Finally, while this month's examples are all based on jazz patterns, the general points covered in the main body of the text are equally applicable to any style of music where a human feel is required.

◆ = hard (MIDI velocity range 100-127)
◇ = medium (range 80-100)
◇ = soft (range 60-80)
◆ = ultra soft (less than 60)

JAZZ PATTERN A — Tempo = 100-120bpm

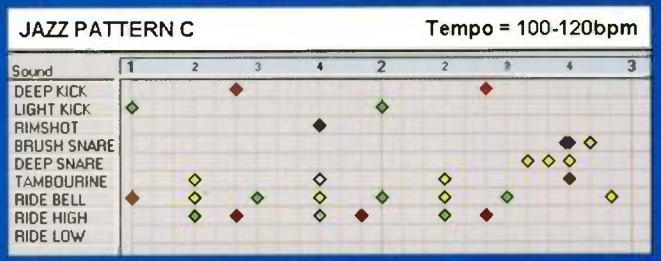
JAZZ PATTERN A — This is the archetypal (some might say cliché) jazz rhythm, played using the ride cymbal. Note, though, that even with a simple pattern such as this, we're using the ride and ride bell sounds to add a little extra interest to the rhythm.

JAZZ PATTERN B — Tempo = 100-120bpm



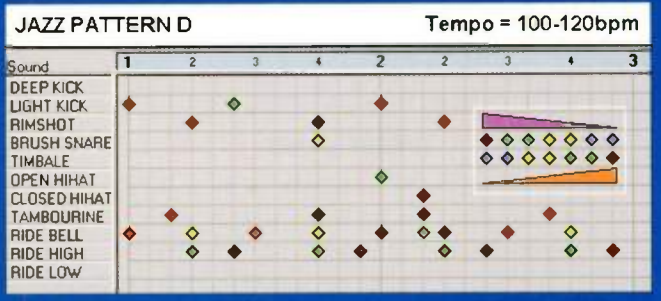
JAZZ PATTERN B — With more blobs on the grid you can see that this is a more intricate version of pattern A. Again we're mixing the ride bell and ride cymbals to give more interest at the top end. I've also doubled up the tambourine with the pedal hi-hat to add emphasis to the second and fourth beats in each bar.

JAZZ PATTERN C — Tempo = 100-120bpm



JAZZ PATTERN C — The snare fill towards the end of the second bar uses a mix of two snare sounds to simulate the changing timbre of an acoustic drum. The 'double diamond' (brush snare, fourth beat, second bar) is a flam, when two notes are played close together.

JAZZ PATTERN D — Tempo = 100-120bpm



JAZZ PATTERN D — This example mixes sounds again — bringing in the metallic sounds of a timbale over the top of the brush snare during a short roll. The psychedelic wedges are supposed to indicate the fact that one gets louder and the other gets quieter — but I guess you'd probably worked that out for yourself. Timbale sounds are often quite strident, so you might have to play around with the relative volumes of the snare and timbale to get the most pleasing effect.

simply assemble them in a random order. Hence the first verse might consist of patterns 1/2/3/4, but the second would be 2/4/2/3, and so on. Again, don't try to second-guess the result. When played end to end, the finished rhythm track might sound a bit iffy, but once you've got the rest of the instruments in place the result should sound more coherent.

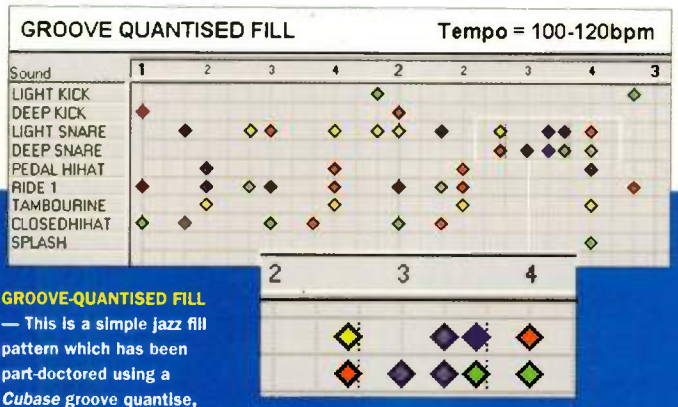
With a sequencer, applying this technique is even easier. For example, in the edit page of a program like *Cubase* you can easily sub-divide your master and variation patterns into smaller sections — half-bars, or even quarter-bars, for instance, and then use these smaller building blocks to build up the complete drum track.

Once the other parts are in place, it's worth going back to the drum edit page and tweaking the patterns to better fit the structure of the track. For example, there might be places where the insertion of a crash cymbal would provide an accent or mark the division of a bar.

Et voila! What you now have is a rhythm track with a large element of unpredictability about it — almost as good as a having a machine with its own mind!

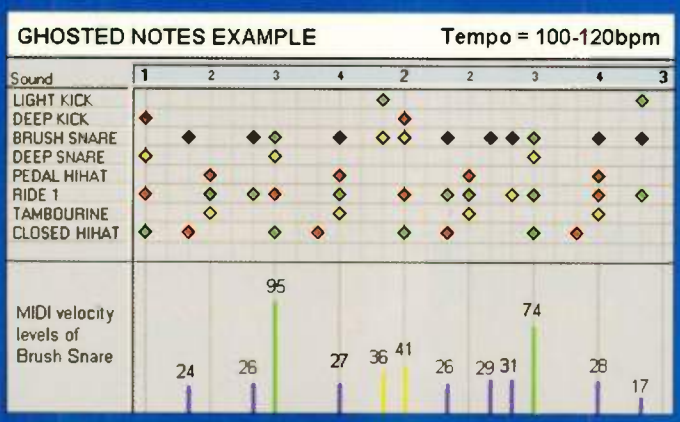
SOS

"Dynamics are crucial to creating a sense of movement within any drum pattern."

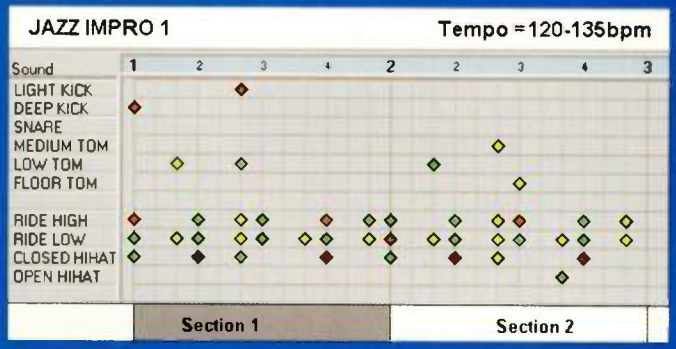


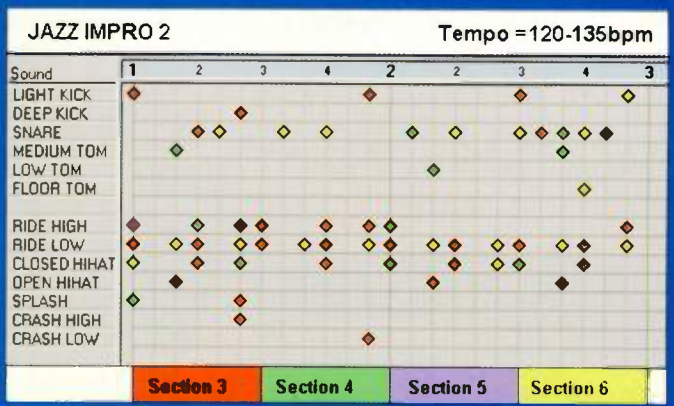
GROOVE-QUANTISED FILL — This is a simple jazz fill pattern which has been part-doctored using a *Cubase* groove quantise, although only the bit contained in the white box. The results are shown more clearly in the enlarged section. The result is a lazy, lumpy snare fill which sounds very human indeed! I would probably apply this quantise to any other instruments which were playing at this time, so that the whole 'band' sounds locked in together, even though they're all 'out of time'. Rather than applying these quantise treatments wholesale across a song, I tend to use different treatments in different parts of the song. There are times when you want things to sound tight and absolutely locked into the groove, other times when you want to 'push' a chorus, or 'pull back' a verse. This may sound corny, but think of the different character of each part of a song, then look at how you might enhance them through playing about with the micro-timing of beats.

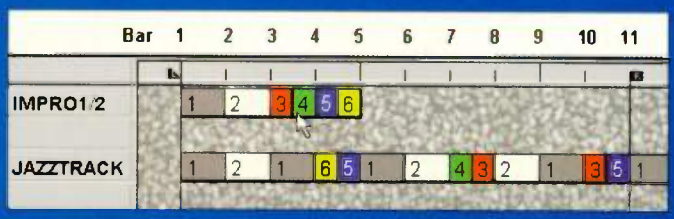
You can also try a reverse approach. A lot of people will quantise the rhythm track to death while being happy to input the rest of the instruments in real time. What you can consider is copying instrumental tracks to the drum tracks, then using the note-ons of the melodic parts as the basis for quantising the drums.



GHOSTED NOTES — If you watch a jazz drummer playing, you'll notice a lot of tapping away at the snare drum in between the main beats or accents. These are often known as ghost notes and, while you often can't hear them when a band is in full flight, they add a characteristic background wash to a recording or live performance. The purists out there might consider even taking all the attack off the ghosted sound and then feeding it through a short reverb back into the main drum mix. This also goes some way towards simulating the way that the snare will vibrate whenever other drums in an acoustic kit are struck.







JAZZ IMPRO 1, 2 & 3 — You've probably already got the idea from the main body of the text, but here's a couple of patterns which have been chopped up and reassembled.

The toms in Jazz Impro 1, especially in Section 1, give the pattern a strong theme, so when putting the track together I've used this as the first bar in each four-bar section.

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The Power Of N

KORG N5 MUSIC SYNTHESIZER

MARTIN RUSS looks at Korg's affordable new synth and finds it takes him back a few years...

After a long period during which the straight polysynth seemed to have been superseded by the workstation, the last couple of years have seen the return of affordable instruments in the 'around £700' area. In close association, the arpeggiator and real-time 'live' front-panel controllers have reappeared too. The technology may have changed radically, but we seem to be returning to the days of the Roland JX3P and the Korg PolySix and Poly 61.

Reworking an existing product into different variants is as old as manufacturing itself. For some time we've been seeing the sound engine extracted from a workstation and turned into a rackmount expander, after which a keyboard is added to the guts of the expander to create a synthesizer. Often, the operation of removing and adding bits is done with a certain lack of subtlety, with the result that the derived expander and keyboard versions feel inconsistent. So you'll be as pleased as I was to discover that the N5 is not just an NS5R with an added keyboard, or an N364 without the sequencer and disk drive. Instead, it's a coherent and well-thought out S&S (Sample & Synthesis) polysynth, with 64-note polyphony, a 61-note keyboard, an arpeggiator to play around with, and real knobs to tweak! For those who like a bigger keyboard, there's the N1, an 88-key version with extra sample ROM (18Mb instead of 12) and two extra audio outputs.

STRUCTURE

The key to using any modern instrument is getting your head around how the sounds are put together. Back in the 1970s this meant selecting a patch and knowing that there were oscillators, filters and envelopes underneath. Nowadays, there's a lot more to cope with. The N5 shares the same split personality as most keyboards with a 'rapidly-becoming-a-standard-on-entry-level-products' PC/Mac computer interface. It has two modes of working: one based around playing it as a performance instrument, and another where it's used as a multitimbral sound source. Avoiding any ▶

pros & cons

KORG N5 £725

pros
- Resonant Filter effect.
- PC/Mac interface and editor software.
- 64-note polyphonic.
- Four real-time control knobs.
- Arpeggiator.
- Reasonable price.

cons
- Only two audio outputs.
- No ROM expansion port.
- Numeric keypad!

summary

A lot of synthesizer, a lot of polyphony, and a lot of real-time performance capabilities — for not a lot really!

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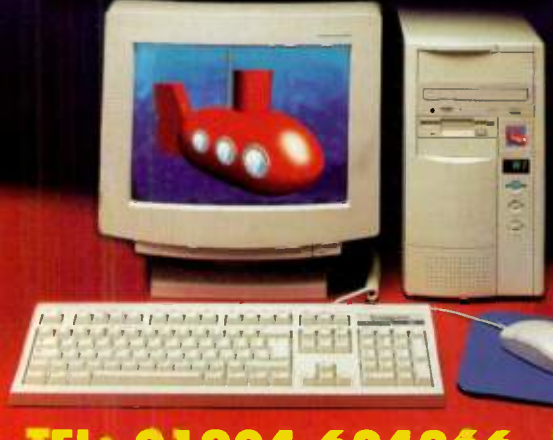

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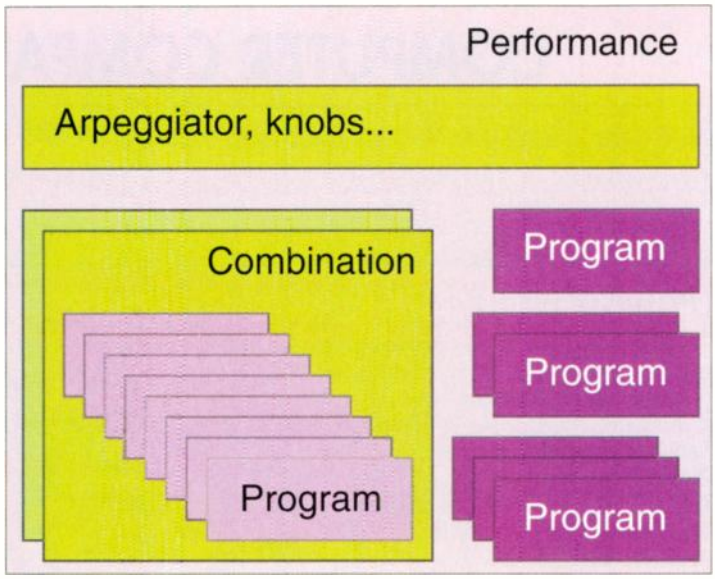

hint of techno-babble, Korg call these Performance Mode and Multi Mode respectively.

The basic underlying sound-generating element is called a Program, and this contains the oscillators, filters and envelopes of the usual S&S (AI² in Korg-speak) voice architecture. If you assign programs to MIDI channels, and set volumes, pan positions, effects sends and returns with the on-board 'mixer', you create a Multi, with up to 32 parts (Programs), and ideally suited to use with a computer sequencer. If you take a Multi and cut it down to eight parts, driven by the keyboard, you have what Korg call a Combination, which provides stacks, layers and splits to help you use up all that polyphony. Add in a snapshot of the front-panel controls, the real-time knobs and the arpeggiator, and you get a Performance.

The N5 powers up in Performance number 01, and it's very tempting to just choose Combinations or Programs and play them using this set of front-panel control settings, but it's almost better to go through the 32 Performances first, because they show the instrument to its best advantage.

ARCHITECTURE & SOUNDS

The N5 uses Korg's AI variant of S&S synthesis, providing audio samples which can be processed with a filter and envelopes, and then have effects applied to them. It's a well-worn technique which is capable of producing some very effective and useful sounds. Synthesizer purists criticise S&S for its 'painting-by-numbers' approach, arguing that it is little more than sample replay. But Korg's strength has been in the programming of sounds for its instruments, from the ubiquitous M1 of 10 years ago through to the present day, and once you get past the GM, GS and XG sounds, which are predictably very much in the sample replay vein, there are plenty of sounds which exploit the full capabilities of the architecture.

AI synthesis provides single or double oscillators, as well as the special-purpose 'drum' mode, where individual keys on the keyboard can have samples assigned to them. Using two oscillators halves the polyphony, of course, but having two samples available in double-oscillator mode provides considerably more scope for clever programming. The weak link in Korg's S&S synthesis has always been the filters, and the N5 has the same rather tame 'Colour Intensity' control where other synthesizers have a more useful 'Resonance' control. Korg have addressed this in the N5 by providing an effect called Resonant Filter, which enables you to create those clichéd, synthetic-sounding band-pass filter sweeps.

There are 47 other effects types, split into single, series and parallel categories, and two independent processors, which means that you can have a maximum of four independent effects simultaneously. The N5 only has two outputs, so all these effects are mixed down to just a stereo pair. As usual, the effects should be used in the context of a Performance, Combination or Multi rather than an individual Program, and their quality is very good, with the now almost standard set of effects types: Reverb; Early Reflections; Delays & Echoes; Chorus; Flanging & Phasing; Exciter; Distortion; Tremolo and Rotary Speaker; and Parametric EQ. Series and parallel combinations of these are also provided, and the N5 allows you to use MIDI Controllers or aftertouch as modulation sources for controlling wet/dry effects mix.

The raw sonic material for the synthesis engine to manipulate is actually a mix of samples and multisamples. Korg provided, the samples required for the GM sounds, plus a large number of additional ones: 527 instrument samples and 285 drum samples. Included are some bass synth sounds with built-in resonant filter sweeps, quite a lot of

FACTORY SOUNDS

It's traditional for reviewers to include a few of their recommended sounds. Here are my faves:

- CmbA:00:Megatron. Big, brashy and bouncy comping sound.
- CmbA:30:FreeTime. Echoey, ethereal and eastern in feel.
- CmbA:40:Vectoring. Bound to be used as an intro...
- CmbA:43:Sting&Wind. Gorgeous plinky plucks and synth flute.
- CmbB:30:First*Snow. Typically S&S pad. Soundtrack fodder.
- CmbC:13:Percolator. Split for show-offs.
- CmbC:59:THE Deep. Multisample soundtrack & pads.
- CmbC:62:HumanBeam. Neat plink and pad combination.
- PrgU:90:WaveSweep. Complexity from simplicity.
- PrgC:70:PolySix. So I'm not the only one who thinks...

Don't forget to try out the Performances too!

WITH KNOBS ON

The four assignable control knobs might be seen by some as a knee-jerk reaction to the Yamaha CS1x/AN1x, but don't forget that this is an old idea — the Alesis Quadrasynth is a modern example of a synth with four control knobs, and if we go back to the Oberheim OBXs and OBAs of the '70s, the whole front panel was full of real-time control knobs!

The cycle of user control styles seems to be returning to knobs, after a long period where parameter dials, increment/decrement buttons and selector switches were predominant. Of course, the ultimate expression of this was in Yamaha's 'one slider, many buttons' DX7 user interface, and some people liked the two-handed approach to parameter changing that this dictated. But whilst this method of changing sounds is fine for people who change many parameters and then move their hands to the keyboard and play, it's much less suited to people who play, then make a minor tweak; play again, tweak again; and so on. It looks as though the knob-twiddlers are in the ascendancy once more.

Technically speaking, there's an interesting corollary to this 'knobs versus parameter access' cycle. Scanning large numbers of control knobs to determine their values in an analogue synthesizer uses quite a few chips and quite a bit of processing. In the '70s this was a major contributor to the price, whereas a single slider and parameter buttons enabled Yamaha's DX7 to concentrate on its custom FM ASIC chips and still deliver what was, at the time, a gob-smacking polyphony and sound quality. In these all-digital days, the processing to do the scanning and analogue-to-digital conversion is built into fast, cheap microcontroller chips, so the cost of providing synthesizers bristling with real-time control knobs has fallen considerably — which is why they're now back on the agenda. As an aside, the microcontroller chips incorporate these scanning and conversion features because mass-market consumer products like video recorders require them, not because a few synthesizers can make use of them!

inspired TASCAM

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■ **Extensive "up-top" control surface** with multiple faders and controls, provides maximum degree of functionality at any time, while optimum use of assignability provides deeper access to functions and parameters when required. ■ **Synchronization and control**; direct digital interfacing (TDIF, AES/EBU, S/PDIF) and full function transport control (TASCAM sync I/O, Sony P2, MMC) enable desk and recorders to operate seamlessly. ■ **High resolution A/D convertors**, high-performance mic-amps and balanced line inputs. ■ **Programmable** level, EQ, pan, aux, solo/cue and dynamics' processing operate under snap-shot scene automation, with on-line dynamic automation software also available. ■ **Full scale monitor and comms** facilities.

LCD console/channel status and parameter values display, and full analogue and digital I/O metering give the TM-D8000 an operational status superior to far more expensive analogue recording and post production consoles.

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'noises' (scrapes, clinks and clunks, plus the essential 'Pole' metallic clang), a 'probably fixable in the mix' bagpipe sound, a very chiffy 'Doo' sound, some rather restrained applause contrasted with a huge stadium roar, FX as per GM and beyond, and lots of single-cycle timbres and loops. There's plenty for programmers to get their teeth into, especially given the N5's 64-note polyphony and up to eight parts per Combination.

The N5's GM sounds are actually pretty good — very close to the standard GM set, but high quality. The non-GM sounds are wide-ranging and highly usable, including glossy and sparkly pads, bright, stand-out comping sounds, distorted guitars in all flavours, tinkly pads with moody solo sounds, instant soundtracks, brash synth monsters, orchestral moods, and more... It's difficult to find fault, actually. It's the sounds that sell S&S synthesis, and there are many excellent ones crammed into the N5.

EDITING

Finding your way around an instrument is very important. Basic tasks such as selecting Combinations or Multis are very straightforward on the N5. Getting around Performances is slightly less obvious, requiring button-presses to move back and forth between the display page, where you choose a Performance, and the page where you can see which Combinations or Programs make it up. Named (rather than numbered) Performances and a slightly different single-screen layout (with smaller text, perhaps) would have been so much better!

To move between editing pages and modes, the N5 uses a mixture of presses of the Perform or Multi buttons, cursor buttons and the Part/Page buttons. Actually getting into Program Edit mode can be confusing until you get the hang of the Program/Combination/Performance hierarchy. And I must confess to not liking the numeric keypad at all. But these are minor points that you grow used to in time.

COMPARISON

The obvious contender in a comparison race might appear to be the Yamaha AN1x, but the Yamaha CS1x, Alesis QS6 and Quasimidi Raven are actually closer in their synthesis technology. The CS1x is cheaper but has only 32-note polyphony and lacks GS compatibility, whilst the Raven is more expensive and has a more comprehensive arpeggiator, but has no computer interface and is arguably in the next price bracket upwards. The QS6 (reviewed *SOS* January 1996) is the closest fit: it has the same polyphony and a computer interface, but has a smaller display.

And don't forget the Korg N1, the N5's big brother, with 88 keys and more sample ROM.

I just keep nagging away on the subject of user interfaces, in the hope that one day...

When editing Multis, changes that you make to the volume, pan, keyboard range, transposition, filter cut-off, LFO speeds, envelope settings, and so on, are stored as offsets rather than changes to the underlying Programs, so the Program itself stays unchanged. This is excellent for those people who want to make changes to a mix, but who do not want to make minor changes to Programs and have to save all the slight variations.

PLAYING

Enough about editing. What's the N5 like to play?

Well, the keyboard is one of those you either love or hate. I'm not a great fan of this type of very springy keyboard, but the aftertouch transition is very smooth. The tops of the white keys on the N5 are slightly convex, which feels strange to my fingers after years of flat-topped keys — but it does have the advantage that if you hold your head about half a metre above the keys, you get a perfect reflection of your entire head on each of about an octave's worth of keys. Someone's going to use this in a music video — and if they weren't, they are now!

The Korg-style pitch-bend and modulation wheels are smaller than I'm used to, since I was raised on Minimoogs, and the spacing between them is a little wider than on many other synths. But I adapted quite easily, and I'm sure the extra exercise for my left hand's little finger will do it good. Portamento is one of those performance effects that faded away when digital came in many years ago, and which you only notice you've missed when it comes back!

The four real-time control knobs are simplicity itself to use. With only two sets of parameters to choose from (Attack, Release, Filter Cut-off, FX; or Upper/Lower balance (splits), Panpot, Portamento time and Mod 2) unless you re-assign them yourself, you rapidly start to use them as extra controls over the sound, and you can save them as part of a Performance.

The Arpeggiator is cleverly designed to squeeze the absolute maximum from the available facilities. There are 11 up, down, random and other arpeggio patterns, and though this doesn't sound like many, there's an extra control that allows you to choose octave jumps — set it to 1 and you'll arpeggiate just the notes you're holding down, but set it to 2 and you'll get those notes in the first repeat, but those an octave higher in the repeat after that, and then back to the first set of notes. Beyond these basic patterns, there are also two sets of extra patterns, prefixed with B and D. The

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Definition

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

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

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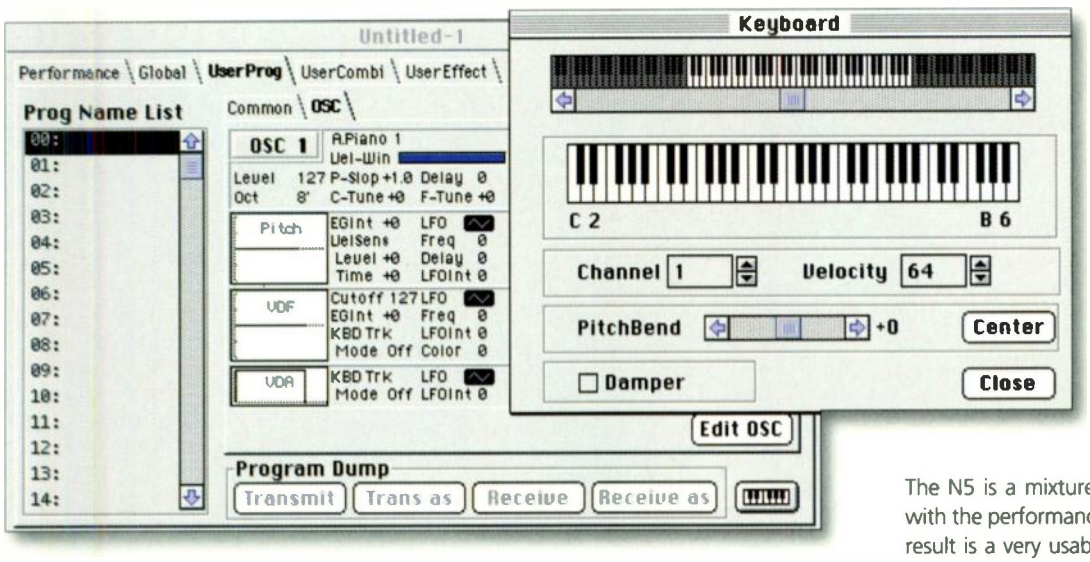
Korg N5

five in the B set are designed to produce walking bass patterns, and here the octave selection is very effective when set to 2, because it then provides an alternate-bar octave jump — and of course, because this is an arpeggiator it tracks note changes, and so gives you a simple 'hold-down-a-bass-root' auto-walking bass feature.

The four patterns in the D set are intended for use with the multisampled drum kit programs, and these work best with the octave jump turned off. The drum patterns are designed to work with the lowest key on the keyboard (and this is built into some of the performances — try that lowest C!) so you get Emu Orbit-style transposed instrumentation variations if you play any other note. These 'pattern-based' features aren't as trite as they might sound, and they allow you to try out ideas quickly and simply on a single keyboard. (If you like one of the patterns, you could always record the arpeggio at the MIDI Out and edit it using an external sequencer.)

It's the way that the settings of all these controls can be recalled, by selecting a Performance, that makes them easy to use. One final thing about the front-panel controls: it's a measure of the success and ubiquity of the Sony Walkman that you now find a 3.5-mm stereo headphone jack socket where not that long ago you might reasonably have expected a quarter-inch stereo jack (and on the N1 you do find one!). I was pleasantly surprised by the available volume too.



The N5 comes with basic PC/Mac editing software.

N5 SPECIFICATION

- 61-note velocity- and monophonic pressure/aftertouch-sensitive keyboard
- 64-note polyphony
- 32-part multitimbrality
- 4-part multi-effects (2 processors)
- 12Mb internal ROM samples
- 527 instrument samples
- 285 drum/percussion samples
- 32 Performances
- 302 preset Combinations
- 100 user Combination memories
- 1169 preset Programs
- 100 user Program memories
- 48 effects types
- 39 drum kits
- Poly portamento!
- Arpeggiator
- 4 real-time control knobs
- GM, XG, GS compatibility mode
- Mac/PC computer interface with 05R/W emulation mode
- External PSU

THE MANUAL

The A4 110-page manual is from the 'describe each screen and function' school, and only has a little bit of deeper material in the form of hints and tips. I kept hoping that I'd find a section that pulled me to one side and explained why there's an Off position for the Pan controls with a music 'rest' symbol, or why the normally orange LCD backlight flashes green and orange during the demo songs, but only allows you to set it to change colour when receiving GM, XG or GS messages...

The manual devotes quite a lot of its back pages to the setup of the N5 with a computer, and a floppy disk containing Mac and PC support software is also supplied: this comprises an N5 sound editor, MIDI driver software and a MIDI file format converter, plus an OMS driver for the Mac. The catch is that the serial cable you'd need for connecting the synth to your computer is not included — so make sure you buy one with the N5 if you want to use it as your computer MIDI interface and sound generator.

AND FINALLY...

The N5 is a mixture of '90s digital S&S synthesis with the performance controls of the '70s, and the result is a very usable synthesizer that has a wide breadth of sounds coupled with a lot of playability — I really enjoyed using it.

In fact, the N5 strongly reminded me of the old Korg PolySix — I think it's mainly the knobs and the typeface used for the front-panel text, and the single-function buttons, that trigger the nostalgia. And although this is a sparsely-populated front panel, the LCD need not be the complete focus of your attention, largely *because* those buttons mostly have only one function — and you can use them live. I imagine that some people may well ignore the Performances and just set up the arpeggiator on the fly — rather like doing patch changes on analogue monosyths.

As so often happens these days, the external casing doesn't reflect the power and opportunity lurking inside. The N5 is a big synth disguised as a small one — add it to your audition schedule! SOS

info

E N5 £725 including VAT; N1 £TBA.
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D880	•															
D880S	•															
C1000S	•	•	•	•	•	•	•	•	•		•	•	•	•	•	
C3000	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•
SE300B/CK91		•			•	•	•		•			•	•	•	•	
C411					•		•									
C416		•	•	•												•
C418									•		•			•		
C419								•							•	
D81						•										
WMS51HT	•															
D3700WL	•															
D3800WL	•															
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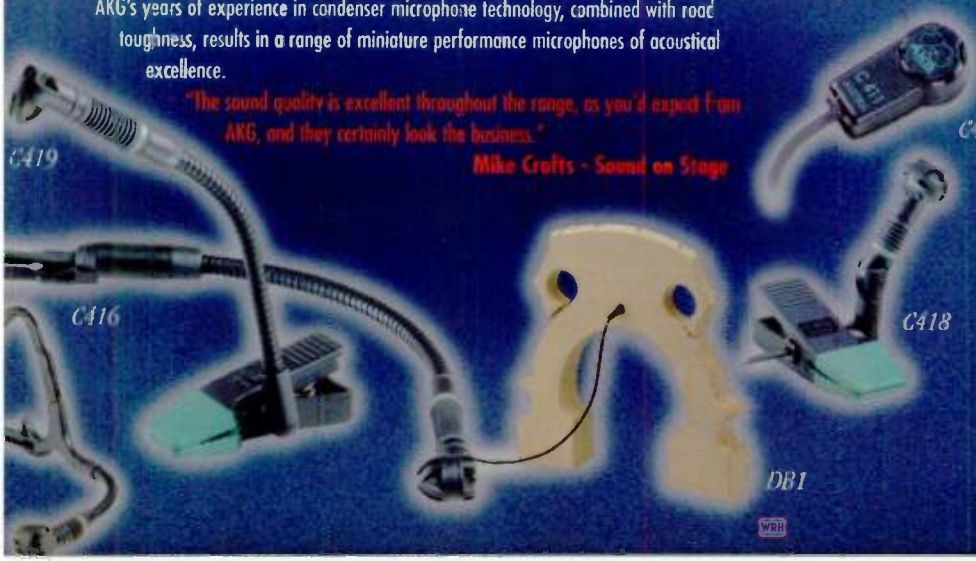

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ELECTRIC DREAMS
Giorgio Moroder

With 200 gold and platinum discs to his name, techno-pop pioneer Giorgio Moroder can afford to sit back and take stock of his amazingly successful career. RICHARD BUSKIN talks to him about it, from early days working with disco diva Donna Summer, to the present.

"I don't really have time for my old records," says Giorgio Moroder. "It's not that I don't like them, but if I listen for too long I get nervous."

That's right — this influential composer and producer, whose name is synonymous with mid-'70s disco music and early '80s techno-pop, is not above a spot of reappraisal and self-criticism when it comes to reviewing his past achievements. Not even 200 gold and platinum discs, three Oscars and three Golden Globe Awards can muffle his finely-tuned sense of hearing.

During a career that has spanned nearly three decades, the roster of artists Giorgio Moroder has worked with is impressive, to say the least: David Bowie, Van Halen, Janet Jackson, Elton John, RuPaul, Cher, Pat Benatar, Chaka Khan, Roger Daltrey, Jon Anderson, Graham Nash... The list goes on and on, and it's also worth noting that about 95% of Moroder's workload has comprised his own compositions.

Perhaps his most famous collaboration was with Donna Summer, the original Disco Queen whose recordings projected modern dance music into the pop mainstream two decades ago. 'Love To Love You, Baby' was the breakthrough hit, and after that there was no turning back for either Summer or Moroder.

BREAKING THROUGH

"At that time I was in Munich with my assistant Pete Bellotte," Moroder recalls. "Basically, Donna Summer was one of the girls in a backing band that we used on a record, and we liked her voice and the way she looked."

A native of northern Italy, Giorgio Moroder had started out during the '60s playing guitar and then bass in a covers outfit which toured nightclubs around Europe. By the end of that decade and into the start of the next he was dividing his time between Italy and Germany, and it was shortly after he'd started enjoying his first modest hits as a composer that Donna Summer entered his life.

Summer had relocated to Munich to take a part in the local stage production of *Hair*. Moroder and Bellotte subsequently recorded two singles with her, 'The Hostage' and 'Ladies Of The Night'. Then, in 1975, came 'Love To Love You, Baby', the then-controversial number which has been widely credited for helping to ignite the disco craze, as well as, shortly afterwards, 'I Feel Love', which pioneered techno-pop. Moroder, who produced both records, in addition to composing the music and co-writing the lyrics with Summer, did not foresee their impact at the time.

"We really just thought of 'Love To Love You, Baby' as a bit of fun," he says. "At one point I'd suggested doing a sexy song, almost like the Serge Gainsbourg hit 'Je T'aime', and one afternoon Donna came to the office and said she'd come up with the title 'Love To Love You, Baby'. That sounded good to me. Back then I had a studio in the basement of my Munich apartment building, called Music Land — which later became famous when acts such as The Rolling Stones, Led Zeppelin and Elton John used it — and it happened to be empty that afternoon, so I went straight down there and composed the song. Then, a day or two later, Donna came in and we did a very rough demo.

"The way I demo'd back then wasn't much different to the way I work now. In 1974 the first cheap little drum machines came out, so I would use one of those, and I also had a real drum loop with several different tempos. I would put up a tape from a 24-track and I would have a mic for the vocal, as well as some sort of keyboard — a Fender Rhodes, maybe. Having established the tempo of the song, I would just record the rhythm, along with a guide vocal, and then go from there."

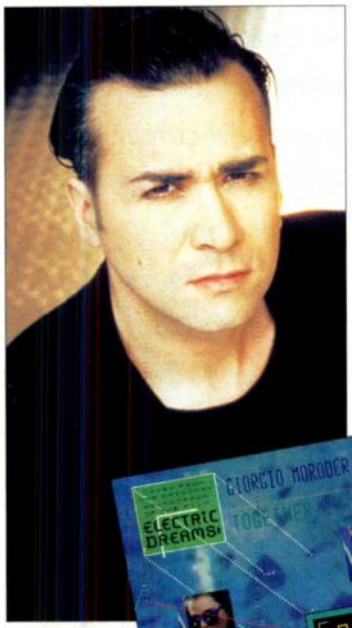
A few days after recording the demo for 'Love To Love You, Baby' Moroder was able to play it to people attending the MIDEM show in the south of France. "The reaction was absolutely incredible," he recalls, "so we went back to Germany, re-recorded the song and presented it to Neil Bogart of Casablanca Records. He took it, and then a few weeks later he phoned me at 3 o'clock in the morning with the idea of extending the number to cover the whole side of an album! So that's what we did, over the course of about two weeks."

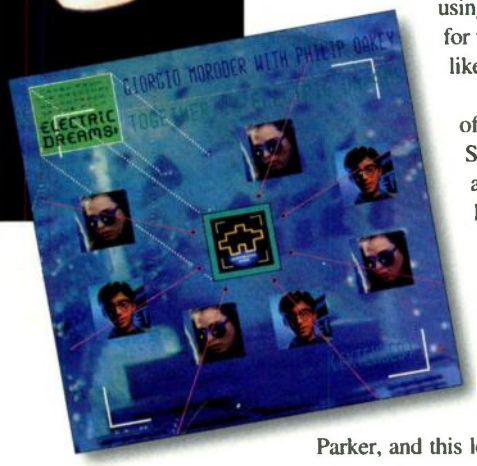
Courtesy of Summer's sexy lead vocal, complete with climactic groans and heavy breathing, the record caused a fair amount of controversy on its release, yet today Moroder not only claims not to have set out to cause any kind of a stir, but also to have been largely unaware of the reaction.

"I wasn't really in touch with what was going on in England and America," he says. "I got some feedback about how the record was selling through the music papers, but I was never one for going to ▶

JANET & GIORGIO

It's easy to forget that the best-selling vocalist Janet Jackson was once just the younger sister of her more famous brother Michael, just about to record her 1984 debut album, with Giorgio Moroder taking on half the production duties. Though she clearly had potential, the project wasn't all plain sailing for Moroder: "Obviously, at that time she wasn't such a good singer as she is now. She was about 16, and my big mistake was that I was so busy working on movies and so on that I didn't really give all of my attention to the project. I regretted that later. I mean, there was some pressure from A&M to record everything fast, but we could also possibly have chosen some better songs and been more careful with regard to how we recorded the voice. After that album she took vocal lessons and she was singing every day, but, with hindsight, when I worked with her she probably wasn't ready. In fact, I have to say that I don't think the second album was much better than the first, so maybe that vindicates me a little bit! Overall, however, the whole production wasn't that great, and so basically it was my fault. I didn't do a good job."





▶ the discotheques. I maybe visited [New York's] Studio 54 once or twice, but I didn't follow the scene and the trends too much. At the same time, Donna originally didn't want to do dance music at all. I mean, I knew her as a great singer with an incredible voice, so when we did the demo for 'Love To Love You, Baby' it was very different for her to be singing in that soft, breathy way. She hadn't sung that way for me before, and she wasn't too interested in disco. Ballads and musical numbers were more her style, but then that record took off and we had a bit of a problem.

"For the second album — which was moderately successful — we wanted to record disco tunes and we wanted to use her proper voice, but we didn't want to change the formula too much. She therefore stayed sexy but a little less so, while using a little more voice, and then for the third album she really sang like we knew she could."

On the strength of the success of 'Love To Love You, Baby', Summer returned to the States and was followed there by Moroder (who would eventually base himself full-time on the West Coast). Continuing to produce Summer's albums, Moroder also composed more hit singles in the same vein. 'I Feel Love' attracted the attention of film director Alan Parker, and this led to Moroder composing and producing the score for the highly acclaimed 1978 movie *Midnight Express*, which gained him his first Academy Award (for Best Original Score).

Other films whose soundtracks Moroder has worked on include *Scarface*, *Superman III*, *American Gigolo* and *Beverly Hills Cop II*. He has won two Best Original Song Academy Awards for Berlin's 'Take My Breath Away', from *Top Gun*', and Irene Cara's 'Flashdance — What A Feeling', from *Flashdance* (each of which also garnered him Golden Globes). Moroder was also responsible for restoring and scoring Fritz Lang's 1926 silent classic, *Metropolis*. This included the hit songs 'Here She Comes', by Bonnie Tyler, and Freddie Mercury's 'Love Kills'.

Another prominent UK artist who collaborated with Moroder was Human League's Phil Oakey; the result was the 1984 single 'Electric Dreams' (featured in the movie of the same name) which was followed up with a full album.

GIORGIO MORODER RARE SYNTHESIZER COLLECTION

US sample CD manufacturers Hollywood Edge produce a sample CD featuring Moroder's favourite synths. *Giorgio Moroder Rare Synthesizer Collection* contains 970 patches from vintage synths including the OSC OSCar, Korg Mono/Poly, Sequential Prophet 5, ARP 2600, Moog modular, Multimoog, TB303, Oberheim 4-voice, Roland Jupiter 8 and Juno 60, Moog Taurus, PPG 2.3, and the Buchla. It's available on CD-ROM in Akai, *SampleCell*, and Ensoniq formats. If you're interested, Time & Space, the UK distributors for Hollywood Edge, should be able to get hold of it for you, though it's not an item they carry in stock. *Derek Johnson*

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SYNTHS: IN THE BEGINNING

Much of Moroder's reputation was forged by his synth-based sound. He first discovered Moog synthesis at the start of the '70s and utilised it to good effect on his own 'Son Of My Father' (which was covered in the UK by Chicory Tip).

"In 1970 an engineer I knew, called Robbie, introduced me to a classical composer in Munich who had this incredible new instrument," he recalls. "It was a humungous machine with cords everywhere, and he played me this composition which just consisted of a bass tone that kept changing every half minute. That was his composition! He was using this huge machine to create what was known as 'musique concrete'. There were no rhythms, no effects, and it wasn't too interesting, but then, when he wasn't around, Robbie took me aside and said, 'Look, with this synthesizer you can create more than just a low note.' He showed me a few things and I thought, 'Wow, this is great!'

"I was immediately fascinated by the possibilities and the different kinds of sounds it could produce. It was two or three weeks later that 'Son Of My Father' became the first of my records to feature a synthesizer, but, although I had several small hits in Europe with other records that used it, I eventually began to lose interest. You see, first of all it was quite a pain in the butt to use, because the Moog in question was the only one around and the classical composer who owned it wasn't too happy about people using it as a popular instrument. He guarded it jealously, so we kind of had to sneak in when he was away. That's how it was for a couple of years, before synthesizers became more widely available."

THE DAWN OF DIGITAL

As well as being in on the early days of synthesis, Moroder was also one of the first producers to give digital recording technology a chance, on the rare 1979 album *E=MC2*, as he revealed last year in an interview with Troy Matthews on the Streetsound hi-nrg website (www.streetsound.com/post30/hinrg/moroder/intmoro/html).

"That was very costly; it was the first album recorded live to a 2-track digital machine." Some sequencing was used, but much of the music was played live: "We had four or five piano players playing live, the drummer live, the melodies were recorded, and I sang live to the tracks. It was a bit of a mess. The cost was something like $15,000 per day — enormous. I'm not Billy Idol or Led Zeppelin; I got nervous because of the new technology. Certain things weren't happening the way I wanted them to."

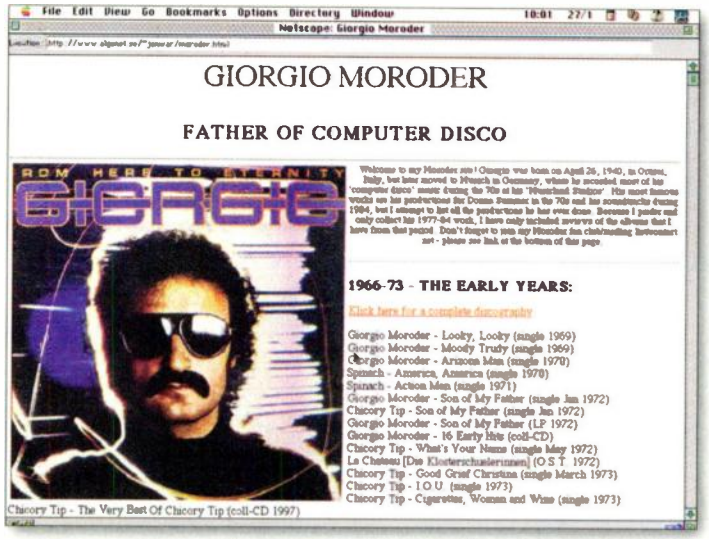
Moroder is enthusiastic about current technology, however: "It's absolutely astonishing. With the computers and the cheap mixing desks now you can have a complete digital recording studio for $30,000 and do absolutely fantastic records. With $30,000 to $40,000 you can do anything. In my house I still have the old SSL and two 24-track Sonys, which I like, but they're 10 years old and were $120,000 back then. That's the great thing now with the technology; it allows whoever has the talent and inspiration to go out there and, for a little money, do things that were literally impossible 10 years ago." *Debbie Poyser*

When they did become more widely available, and in the years since, Moroder made use of them, and his favourites can be heard on the *Giorgio Moroder Rare Synthesizer Collection* sample CD-ROM (see box for more details).

UP TO DATE

Having established a trademark techno sound in the pop arena and attained a level of diversification through his movie work, Moroder gradually began to branch out in terms of his chart-oriented productions. Blondie's 1980 international chart-topper 'Call Me', while still boasting the electronic dance rhythms that characterise much of Moroder's work, also placed more emphasis on the guitar. From this point onwards he continued to move more into the rock arena, while never really betraying his techno roots.

"During the late '70s and early '80s I always worked with great musicians," he recalls, "and I was also assisted by engineers, although I knew how to operate the Harrison desk that I had. Then, until the late '80s, I also had my own big studio in the [*San Fernando*] Valley [*just north of Los Angeles*]. It was called Oasis and that's where I recorded the soundtrack for *Top Gun*. When I sold it I kept the E-Series SSL desk and the 24-track digital machine, so I know my way around and, although I'm not a great engineer, I still do all of the mixes by myself."



This Giorgio Moroder web site features a comprehensive Moroder discography; you can find it at: www.algonet.se/~jonwar/moroder.html

Since the early '90s Moroder has been semi- retired from the music business, but, as you might expect, still can't keep himself completely away from music. Among his ongoing projects are the production and scoring of two stage musicals, one of which is *Flashdance*, which he now owns the rights to, and for which he is composing a set of brand-new songs.

"I'm very excited about these projects, but I don't want to say too much about them right now," he says. "You never know how things can turn out from one day to the next in this business, so it's best to just do what I am doing and then talk about it later!" SOS

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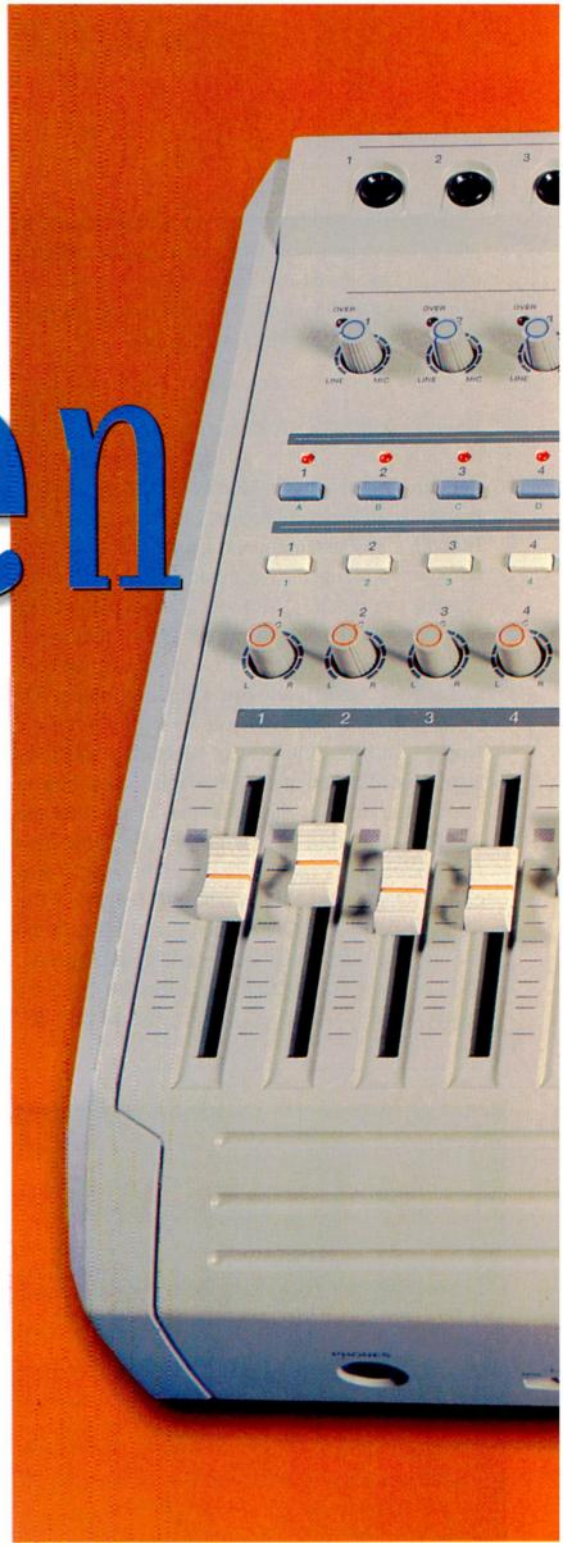
Digital Dozen

AKAI DPS12 DIGITAL PERSONAL STUDIO

Akai build on their years of expertise in stand-alone digital recorders with a truly portable personal multitracker offering a digital mixer and 12 tracks of audio on a removable-media drive. DAVID MELLOR takes it away.



It's cute and I want one! That was my reaction when I first saw the pre-release information on the DPS12 Digital Personal Studio from Akai, who have a long history of manufacturing digital recorders. It's an all-in-one hard disk recorder/mixer that's capable of 12 tracks rather than the more usual eight tracks (though Roland have just announced their VS1680, which provides 16 tracks) and those 12 tracks can be recorded directly onto an internal Iomega Jaz drive (pre-installed and included in the price), which uses removable cartridges.

In addition to its recording features, the DPS12 has a 20-channel mixer, of which 12 channels have physical faders and pan controls. EQ comes as standard, and an effects board will be available as an optional extra later on. Let's jump straight in and see what this little baby can do...

ALL THAT JAZ

The Akai DPS12 comes with an internally mounted Iomega Jaz drive. This is great, firstly because you don't have a separate drive to connect, and secondly because the Jaz drive takes removable 1Gb cartridges, which cost around £60-£70 apiece. Jaz cartridges come pre-formatted for Mac or PC, but the DPS12 uses its own format — naturally enough, since 12-track recording is rather different to the word processor and graphics files that most Jaz users will want to store. Rumour has it that removable hard disk cartridges are not the most permanent form of storage in the world, unless treated with great care, and Akai do recommend backing up, preferably to a magneto-optical drive via the external SCSI connector. You can also record to external drives, apparently up to 14 terabytes (enough for two and a half *years* of stereo recording — if you can afford the disks)!

Recordings are organised on disk in the form of Projects. A Project comprises audio, mixer data and locate points. The manual doesn't say how many Projects can be stored on a single disk, but I got up to 20 before I decided that I'd had more than enough value for my gigabyte. A single 12-track Project at a 44.1kHz sampling rate (48kHz and 32kHz are also available) would allow just over 16 minutes of recording time. Since disk space is dynamically allocated, if not all the tracks were used for their full duration the total start-to-end recording time could be more. If you use the virtual tracks feature, where up to 250 additional tracks can be stored on disk (but not played until allocated to a 'real' track), as alternative takes, perhaps, you might expect the disk to fill up more quickly.

Naturally, the question arises as to whether the DPS12 can actually record 12 tracks reliably. With a tape recorder you never have to worry about this, since each track is given its own space on the tape, but in any disk recording system there is always a compromise between how many tracks can be obtained reliably and how widely the data is scattered on the disk — primarily because of editing, but also due to the order in which different sections of each track are recorded. Needless to say, Akai have done their homework, and I couldn't fault the DPS12 in normal use.

pros & cons

AKAI DPS12 £1299

pros

- 12 tracks.
- Removable media.
- Lovely digital EQ.
- Good jog and shuttle facility.
- Nice bright display.

cons

- No insert points.
- No grouping system.
- No dedicated auxiliary returns.
- No proper monitor output.
- Clicky punch-in.

summary

Despite a few niggly problems, all of which can be worked around, the DPS12 is stable in operation, easy to use, and has some very nice features. It also has 12 tracks and you can record directly onto a removable Jaz cartridge. Bearing all that in mind, I'll happily ignore any small imperfections!

SOUND ON SOUND

RECORDING

The mixer section of the DPS12 has six analogue inputs on balanced jacks (no phantom power for mics, unfortunately), a stereo optical digital input, two analogue auxiliary outputs, two analogue master outputs and an optical digital output which copies the analogue master outputs. It's interesting to note that the mixer lacks auxiliary return inputs and is not provided with a proper monitor output, although there's a headphone output on the front panel that could be used for this purpose.

Although many users will have no need to record more than two tracks at a time, the DPS12 can in fact record up to eight tracks simultaneously. This would obviously be useful for live recordings, but would also come in handy where a composition is built up using a sequencer and MIDI system and is then transferred in bulk to disk. Bear in mind that two of the eight inputs are optical digital, so if you want to record the full eight tracks simultaneously you'll need an outboard convertor.

Once you've created an empty Project, all you have to do to start recording is plug a mic or instrument into Input 1, select record-ready on Track 1, and start recording. Recording starts absolutely the instant you hit the buttons, with no time spent getting up to speed, as happens with tape. I have to say that the Jaz drive makes a bit of a racket, but this is hard disk recording and seems to be what you have to expect. I love removable media, but its very removability makes it impossible to soundproof against the clicking of the disk, or even attenuate it, so ideally the mic ▶

Akai DPS12

> "The performance of the digital mixer is excellent, particularly the EQ."

and the DPS12 should be in separate rooms.

Unlike conventional mixing consoles, the mixer on the DPS12 does not have any grouping system, other than the master outputs, so it's tricky to mix two or more signals onto the same track (this difficulty also applies to track bouncing). It can be done, however, by routing to the masters and then routing the masters internally to tracks. If, in addition, you need to monitor tracks already recorded, while mixing more than one signal to a track, you'll have to go via the auxiliary sends. It's possible and reasonably easy, but you'll need the manual.

I mentioned earlier that there are no dedicated auxiliary return inputs on the DPS12. Most people would use aux returns for the output of their reverb unit, both for mixing and for a little 'sweetening' during the recording process, and their omission might seem to be a problem. However, it's not, because you can easily configure two of the inputs as 'thru mix' channels and use your reverb, without difficulty, all the way through the recording and mixing process. The auxiliary sends work as you would expect, and are individually switchable pre- and post-fader.

Punch-ins are an important part of recording

COMPACT BUT WELL-MUSCLED

The Akai DPS12 is smaller in real life than I imagined from early photos. It's small and light enough to be easily portable, and it's so cute you'll want to give it a cuddle! The six main analogue inputs, on balanced quarter-inch jacks, are on the top surface near the back, which is convenient, but puts ugly cables on display, particularly since the sockets are angled forward slightly. The remaining inputs and outputs are on the rear: master analogue out left and right (phono); auxiliary sends A and B (phono); digital optical stereo in and out; MIDI In and Out/Thru; SCSI (half-pitch connector); footswitch (quarter-inch jack).

The control surface is quite sparsely populated, since the mixer is digital and most operations are carried out through the cursor keys and jog/shuttle wheel. There are, however, six gain controls with peak LEDs for the analogue inputs, 12 each Record Ready and Channel select buttons and, of course, 12 physical faders and pan controls, plus the stereo master fader. Individual channels, or groups of channels, can be solo'd.

On the right of the unit, the display is large enough and bright enough to do the job, aided by six soft keys underneath, whose function varies according to context. The transport controls are large and chunky, as they should be. Just above these is a button panel which offers easy access to most functions of the machine. Almost all the buttons have a dual function, for entering names for Projects, Tracks, and so on. It's not quite as straightforward as a QWERTY keyboard, but it's certainly adequate. On the front of the unit there's a headphone socket with level control and, of course, the Jaz drive.

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technique. The DPS12 supports both manual and automated punch-in, though unfortunately it's not as reliable as it should be — I found that sometimes clicks could be created at the in and out points. Also, when you punch out, the monitor doesn't switch immediately back to playback, as it should. This really needs some attention from Akai. All is not lost, however, as you could quite easily achieve the same effect as a punch-in with a little editing.

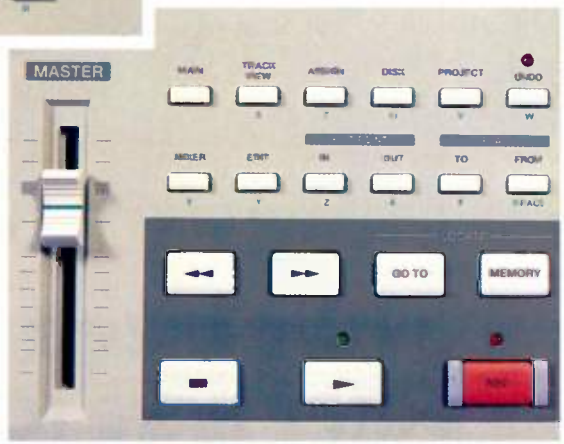
EDITING

Editing with the DPS12 is firstly a matter of selecting the In point and Out point of the section you want to work with. You might want to delete it, for instance, using a Cut and Discard edit, where the offending material is simply silenced. Alternatively, you could Cut and Move, where subsequent material is moved in time. Edits can be on a single track, or across anything up to all 12 tracks.

More sophisticated are the Cut and Copy edits. You can Cut and Paste, or Cut and Insert, or Copy and Paste, or Copy and Insert. Cut means that the material is excised and moved elsewhere, while Copy means that a copy of the material is left behind exactly where it was. Paste means that the editing operation obliterates currently existing material at the edit point, and Insert means that a gap is created for the new material. An Insert Silence command completes the set of simple and very logical editing functions.

To explain the editing operation in more detail, suppose I wanted to copy the material on tracks 1-4 from timecode 00:01:00:00 to 00:02:00:00 (one minute's worth) to tracks 5-8 at timecode 00:03:00:00, erasing the existing material at that point. I'd play to the In point and store it (two button presses), play to the Out point and store it (another two), then play to the point in time at which I wanted to perform the paste. I would then press the Edit button, select tracks 1-4 as my source with the Track Select buttons, select tracks 5-8 as my destination with the Record ▶

"I expect the DPS12 to be a great seller for Akai."



CONTROL PANEL

Central to the operation of the DPS12 is the Control Panel — it's so important that there are four soft keys on the main screen that take you straight to it! Here you can call up a variety of functions, which are as follows:

• AUTO PUNCH: In and out points are set for the punch-in, which may be rehearsed without committing to disk. A repeat function continuously cycles between the In and Out points. There is no pre-roll facility so you have to locate manually to before the In point, so that there is a 'run up' to the punch-in.

• VARI PITCH: used to vary the speed of recording or playback over a range of 68% to 113% of normal speed. This is a wider range than usually found on multitrack recorders, but it would have been nice if the lower end of the range was extended to 50%, to allow for double-speed effects with a pitch shift of an octave.

• TIME DISPLAY: The time can be displayed in terms of hours:minutes:seconds:frames: subframes, or as bars and beats if preferred. Time positions can relate to an absolute zero point, or can be relative to a zero point set by the user. The frame rate, which is particularly relevant when synchronising with other equipment, can be set to any of the five popular rates.

• TIME OFFSET: Used to define the offset amount of relative time.

• TO/FROM TIME: The To and From keys are used to play up to or from the current 'now' position. This screen allows the number of seconds of To or From time to be adjusted between 1 and 10 seconds.

• PLAY MONITOR: For tracks in record-ready mode, the monitor source on playback can be switched between the output of the track (normal) and the input signal to the track, for rehearsal without recording.

• SYNC: Akai's hard disk products traditionally offer excellent sync facilities and the DPS12 is no exception. SMPTE/EBU timecode is not catered for, but MTC certainly is (SMPTE-to-MTC convertors are widely available). The DPS12 can work as either a master or a slave. You wouldn't expect synchronisation as an MTC slave to be absolutely perfect but I found, syncing to a Fostex RD8 with a direct MTC output, that it was usable, and I believe that it would be possible to shuttle tracks back and forth between a DPS12 at home and a commercial studio, providing you could accept an accuracy of a couple of tens of milliseconds either way.

• SAMPLING RATE: The DPS12 offers three sampling rates: 48kHz, 44.1kHz and 32kHz. Obviously, the higher the sampling rate the faster disk space is eaten up, although the highest rate offers a high-frequency response extending up to 22kHz, rather than the 20kHz offered by the 44.1kHz sampling rate. Obviously the digital mixer only has so much horsepower and you will find that EQ facilities are limited at 48kHz. Digital sync, which should be selected when recording from a digital source, is also available from this screen.

• BEAT MAP AND TEMPO MAP: If you're using the bars and beats option rather than timecode clock, you'll need to set a tempo map, and perhaps a beat map too. Changes in tempo are allowed, and tempo can range between 30 and 300bpm (I suppose the latter is for thrash jungle!). The meter can range between 1/4 and 32/32.

• FOOTSWITCH: All multitrack recorders should have a punch-in footswitch socket and the DPS12 does. It can also be used for just about every other control surface function, including the soft key operations.

• MIDI: The DPS12 has few MIDI functions, so it's perhaps justifiable that there are only two MIDI sockets. The operation of the In/Thru socket is set on this page.

• LCD CONTRAST: This is adjustable, as you might expect. Incidentally, the DPS12's LCD is wonderfully bright compared to most others I have seen.

• OTHER: The remaining functions are Meter* Pre/Post fader and the number of Undo steps possible. You can have up to 250 if you really want to, and can afford the disk space.

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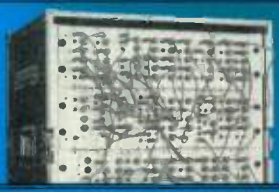

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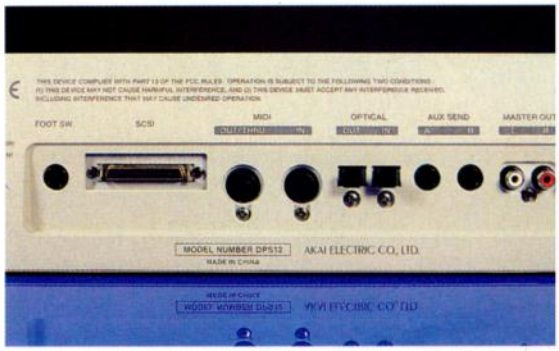


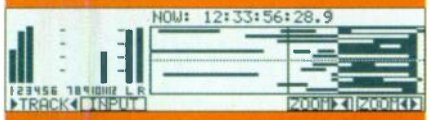
▶ Ready buttons (which are doing an extra job here), and hit the Do It soft key. Done. And if I made a mistake I could always Undo (see 'Control Panel' box for more on the multiple levels of Undo).

In and Out points can also be located in other ways — using the jog/shuttle wheel, which allows tracks to be scrubbed, one at a time, or by entering time values directly. Paste and Insert operations can, by the way, be copied up to 99 times for instant loops.

If I have one quibble with the editing features, it is that Akai haven't provided the Copy and Append function that would butt a section of audio exactly at the end of another section, without making you find the insertion point manually. This would vastly increase the flexibility of a system such as the DPS12.

THROUGH THE RECTANGULAR WINDOW...

TRACK VIEW
The track display shows recorded segments in a moving display across the screen — very useful for finding your way around.



JOG/SHUTTLE
The DPS12 has an excellent jog/shuttle feature which allows individual tracks to be 'scrubbed' to find edit points precisely.

MIXER LEVELS
On the left are bargraph meters showing the levels of recorded tracks. On the right the fader positions are shown. Alternatively, this display can show the eight 'thru mix' channels, where live signals can be added to the mix.

EQ
The DPS12 offers excellent digital EQ, either 2-band or 3-band. Bear in mind, though, that if you require 3-band EQ, it can only be applied to six tracks (at 44.1kHz).

AUXILIARY SENDS
The DPS12 has two auxiliary sends, which can act as individual mono sends or a stereo pair. They are individually switchable pre- or post-fader. Although there are no auxiliary returns, 'thru mix' channels can easily be used to achieve the same results.

another track before mixing. The original could always be retained as a virtual track.

Since the DPS12 doesn't have a separate monitor output, the master fader is your level control for both the monitor speakers and master recorder. Akai suggest that you can connect to a master recorder, and monitor via that, which I could live with, but it's not ideal.

One of the bonus features of digital mixers is that they can often be automated. The DPS12 allows mixer states to be captured as Scenes. Unfortunately, Scenes can only be changed while the DPS12 is stopped, so you can't use them directly to automate a mix. All is not lost, however, since any changes you make during a mix can be sent to a sequencer as control change data. The DPS12 will respond to this as though you were making the changes yourself. Although this is useful and reasonably effective, I would have preferred the DPS12 also to allow access to internally stored Scenes via program change commands, or perhaps to have some internal form of automation that didn't rely on a sequencer at all.

MIXING

A digital mixer isn't as easy to operate as the analogue equivalent, but it can give you more features for the price. As standard, the DPS12 has digital EQ, which can be globally configured as 2-band high and low, or 3-band parametric. If you choose 2-band EQ, all 12 channels can use it. If you select 3-band, only six channels can be so blessed. With 48kHz sampling, these figures are reduced to 10 and five respectively. I think Akai should find a way to allocate the different types of EQ on an individual channel basis, but despite these limitations, the facilities on offer are wonderful.

The 2-band EQ offers LF and HF sections with both level and frequency controls — note that you don't usually get a frequency control on the low and high sections of analogue console EQs unless you pay a high price. Akai's 3-band EQ also has a mid section with level, frequency and Q, which is great to see. Although operating the EQ via the cursor keys and jog wheel is a little fiddly, the results are worth it.

The two auxiliary sends are both pre-/post-fader switchable, as I mentioned earlier, and can function as individual mono sends or as a stereo pair. When these are used with the 'thru mix' facility, the inputs can be used as auxiliary returns to add effects to the mix, or even to bring in other signals — perhaps controlled by an MTC-synchronised sequencer.

The DPS12's mixer section doesn't have insert points, so compressing or gating is going to be a little tricky. You may be able to do it while recording, if you have a voice channel or similar processor, but if you leave it until the mix you're going to have to use the auxiliary sends and 'thru mix' inputs. Personally, I might be tempted to re-record the compressed signal to

CONCLUSIONS

Despite a few problem areas, the Akai DPS12 is still cute and I still want one. Having 12 tracks opens up new possibilities, and the internal removable-media Jaz drive is a blessing. Sound quality is as you would expect from a well-designed digital system (that is, there's nothing at all wrong with it) and while the 32kHz sampling rate is certainly not as crisp as the 44.1 and 48kHz rates, it's usable at a push, if you really have to squeeze the maximum recording time out of a Jaz cartridge. The performance of the digital mixer is excellent, particularly the EQ. Editing features are to the point and appropriate for a stand-alone disk recorder. I'd like to see a proper buss structure with groups you can mix into in the normal way, and the problem with occasional clicks at punch-in points also needs attention, but nevertheless I expect the DPS12 to be a great seller for Akai. Anyone needing a compact, portable studio for home or pro use should give this unit a good close look. SOS

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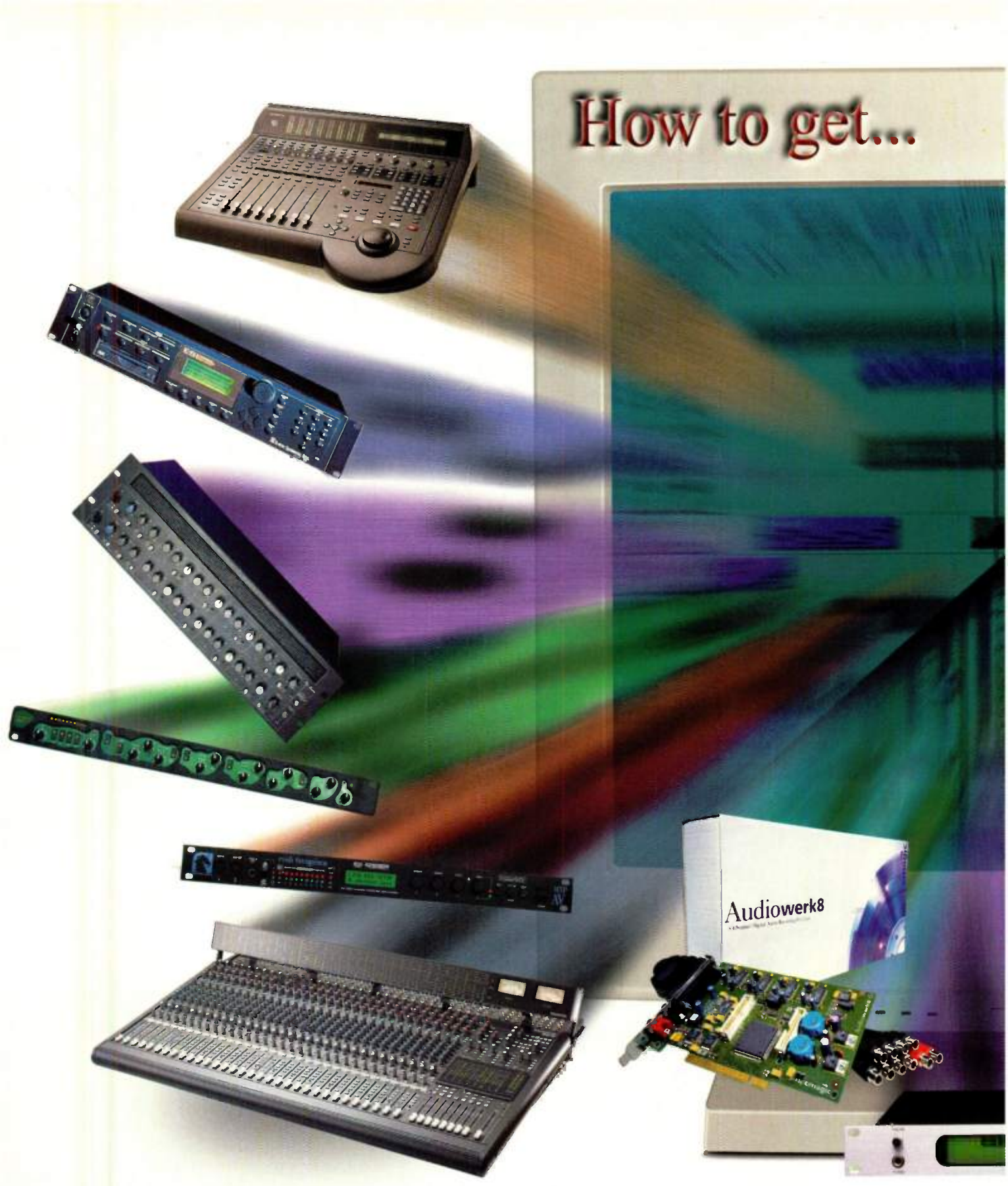

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PRACTICAL STUDIO SOUNDPROOFING

PART 2: DOORS & WINDOWS. No matter how thick and heavy the walls of a studio, it will still leak sound if the doors and windows are not up to scratch. PAUL WHITE explains how you can uprate them without breaking the bank.

Last month, in the introduction of this new series on soundproofing, I stressed that although you can make significant improvements using DIY techniques, you shouldn't expect the impossible. Unless you already have a very solid building with massive walls, you shouldn't expect to be able to contain the sound of a drum kit or a serious studio monitor system turned up full without doing major structural work. What you can expect is a useful reduction in the level of sound leaking into and out of your studio.

Most of the sound leakage that occurs in a typical home studio does so via floors, ceilings, windows and doors. Lightweight partition walls are also less than ideal sound isolators, though a properly constructed one may be reasonably effective. The greatest improvement can usually be made by uprating doors and windows, so I'm going to tackle those first.

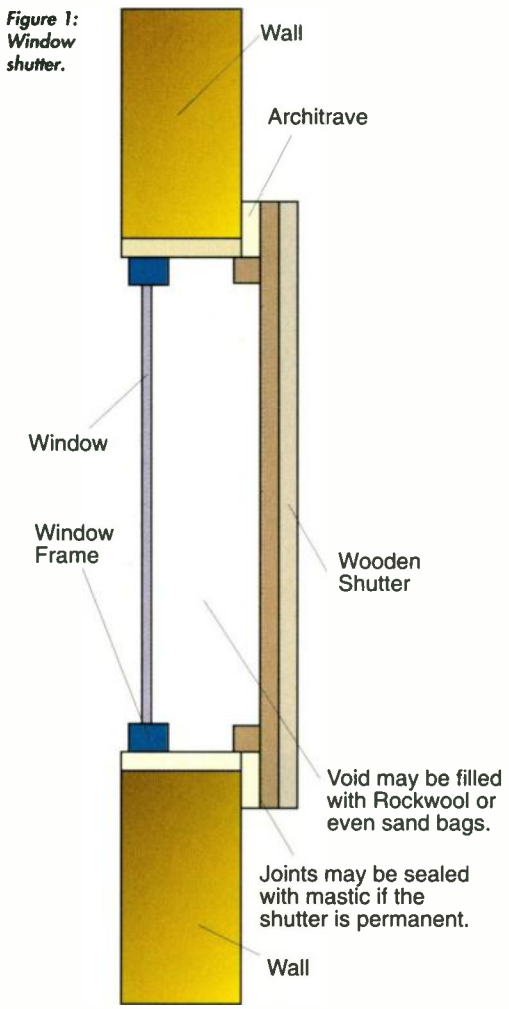

Figure 1: Window shutter.

WINDOWS

If you don't have double glazing, your windows will almost certainly be the biggest cause of sound leakage. Even double-glazed units are of limited use, and will leak far more sound than the surrounding walls, so additional internal glazing behind the original windows is still strongly recommended. If, on the other hand, you are working in a room with regular single-glazed windows, secondary double-glazing should be considered essential unless you're prepared to block up the window aperture altogether, using a shutter or sandbags. DIY secondary double-glazing kits are fairly cost effective, and because the space between the original window and the secondary glazing is quite large, you'll generally find that the amount of sound reduction is better than from conventional double glazing alone. It also helps to use the thickest glass you can find for the internal glazing, as more mass translates into less leakage.

If you can forego the luxury of daylight, the cheap and cheerful solution is to block off the window using a heavy wood or MDF shutter screwed over the window opening, as shown in Figure 1. Fasteners can be used if you need to take the shutter down between sessions, but if you don't need to remove the shutter, stuffing the void between the window and the shutter with Rockwool insulation will also help. Any gaps can be sealed with acrylic frame sealant, applied with a mastic gun. Heavy curtains hung over the shutter or internal glazing will also make a small improvement.

DOORS

As explained last month, a typical lightweight internal door, with plywood skins and a cardboard honeycomb filling, probably provides around 15dB of sound isolation, at best. If there's a gap under or around the door, the figure may be even worse, so if you have this type of door in your studio room the very minimum you should do is fit a heavier door. Even the heaviest door will provide far less attenuation than a solid wall, but you should be able to improve on 15dB! Using a solid timber door and then gluing on an extra layer of ▶

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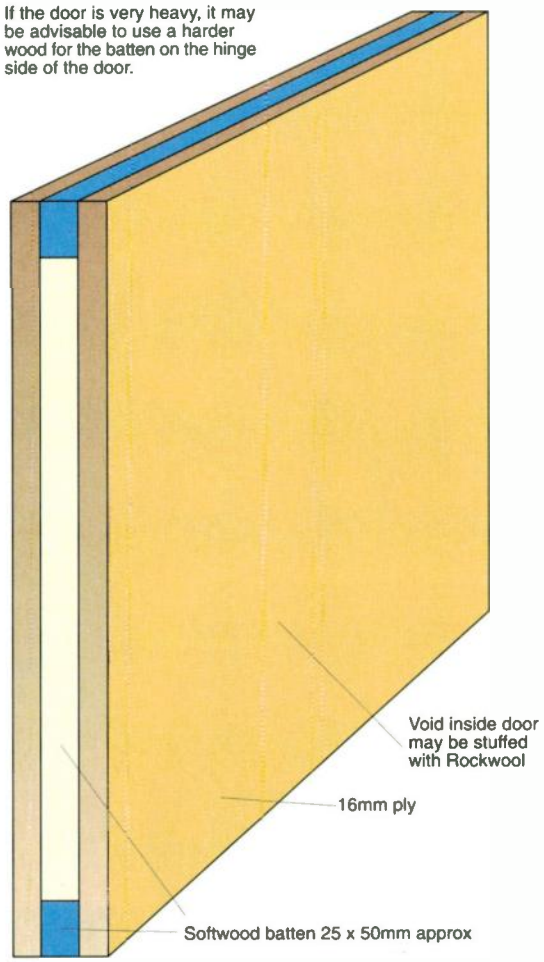

Figure 2: DIY door.

three-quarter-inch ply can work well.

You can, of course, build your own doors, from two layers of thick ply or chipboard, leaving a gap between the two layers of ply and using Rockwool or fibreglass to fill it. This will help to deaden any vibration of the panels and also absorb a proportion of the sound trying to radiate from one panel to the other. If you use chipboard, which is not a structurally strong material, you'll need to add hardwood insets to take the hinges. Plywood is much stronger, and though it's more expensive it makes the job a lot easier. Figure 2 should give you the general idea.

It's also vital to make the door airtight, so use heavy-duty seals around the edges, not forgetting the threshold below the door. If you can afford it, fit a compression latch (similar to those fitted to industrial freezers), so that the door is squeezed more tightly shut as you pull the handle down. These are mechanically simple latches that work by running up a tapered plastic wedge screwed to the door frame, so that the door is forced harder against the seal as the handle is closed.

Figure 3 shows how door seals are fitted. The seal material is available from most good studio materials suppliers; the simplest type is a foam neoprene strip with a semi-circular cross section, and it can be stuck in place with a contact adhesive such as Evo Stik or Bostik. The best way to fit the seals is to hang the door in the frame first, then stick the seals to the wooden closing strips before you nail them in place. With the door closed, pin the strips in place one at a time, so that the seal is just touching the surface of the door — if you try to make the seal compress more than a little, you'll have great difficulty in closing the door, especially if you don't have a compression latch. Once you're sure the door is fitting correctly, you can screw the closing strips permanently in place.

No matter what you do to a single door, it will never be as effective as a double door in situations where a lot of isolation is needed. In most rooms it's possible to fit doors to either side of the wall, leaving an air gap the thickness of the walls between them. This arrangement is shown in Figure 4. Both doors should be fitted with seals, but only one needs to have a pressure latch — the outer door can have a spring closer. In professional studios, the inside of the door frame may contain elaborate sound traps, but for most DIY purposes, sticking a layer of inch-thick fireproof furniture foam around the inside of the inter-door space should be enough.

It's best, where possible, to use separate doorframes, rather than one wide one, when building a double door, but this may only be practical when building from scratch. Separate door frames prevent vibration travelling from the first

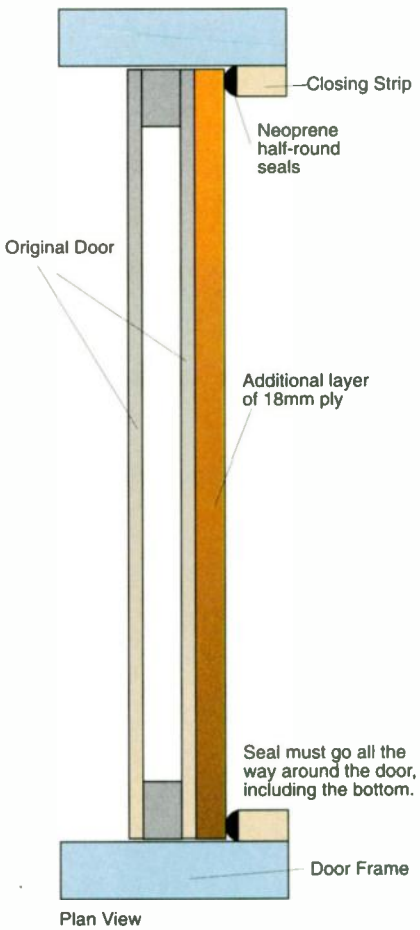

Figure 3: Uprated door with seals.

MAGIC CARPET?

When it comes to sound leakage through ceilings and floors, the best low-cost measure is to fit thick hair underfelt in your studio room and, if possible, also beneath the carpet in the room above. The combined weight and thickness of the carpet and underfelt provides both absorption and damping, so buy the heaviest grade possible. Foam underlay isn't nearly as good as the matted hair type, from an acoustic viewpoint.

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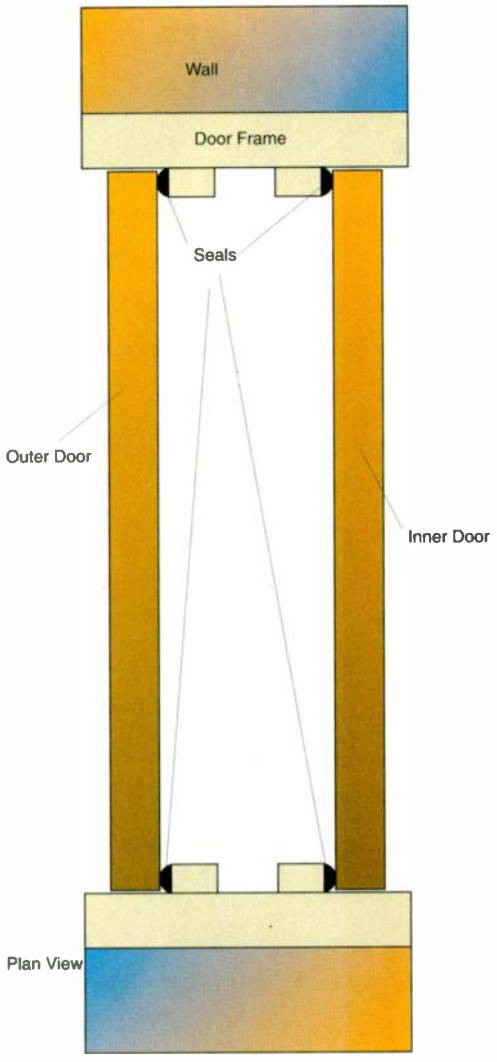


Figure 4: Double-door construction.

▶ door, along the frame and directly to the second door. To this end, frames are often isolated from the surrounding brickwork, and from each other, using Neoprene sheeting. This might be a little extreme for home use, but is worthwhile if you're building a studio from scratch or converting a garage. Gaps may be filled using expanding foam filler or mastic.

PATIO DOORS

Commercial patio doors are a convenient means of dividing the studio's playing area and control room, because they double as both viewing window and door. However, to achieve adequate sound isolation, two sets of double-glazed patio doors with an air gap between them are required. Ideally, the air gap should be 12 inches or more, otherwise low-frequency isolation will be compromised. Larger gaps also help compensate for deficiencies in the door seals.

The walls within the cavity formed by the two sets of doors should be lined with Rockwool or acoustic foam. Figure 5 shows a practical example of patio doors used to divide live and control room areas.

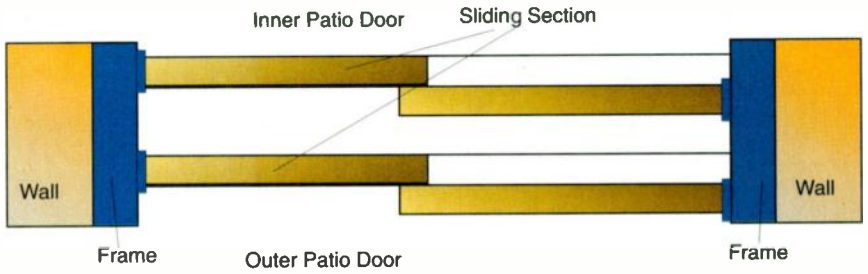
SUMMARY

Ultimately, the amount of soundproofing you do will be tied to your budget and to the available space, but I hope this part of the series will have given you a realistic idea of what is possible. To summarise the rules:

- Doors need to be as heavy as possible and airtight. A double-door assembly will always out-perform a single door.
- Sound travels well through solid materials, so Neoprene sheet can be used to isolate structures such as door frames, studding wall frames, and so on, from the main structure.
- Rockwool stuffed into air gaps will help, and aerosol polyurethane foam is useful for filling small gaps. Mastic or frame sealer can be used for filling smaller gaps.
- For windows, double or triple glazing is invariably the best answer, unless you can afford to block the windows entirely, and in any event the window frames must be airtight.
- The glass panes should be isolated from their respective frames, using Neoprene or foam-rubber glass-mounting strip for the best isolation — though, even when all these steps have been taken, the sound leakage through doors and windows is still likely to be greater than that through the walls. At low frequencies, simple mass forms the only really effective barrier.

Though you may never achieve the goal of a totally soundproof studio, a little DIY work can make the difference between a studio that is workable and one that isn't. Tackle the obvious problems first, and you may find you need do no more than that. SOS

Figure 5: Double patio doors.



The wider the gap between the two patio doors, the better the sound isolation.

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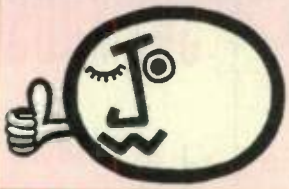

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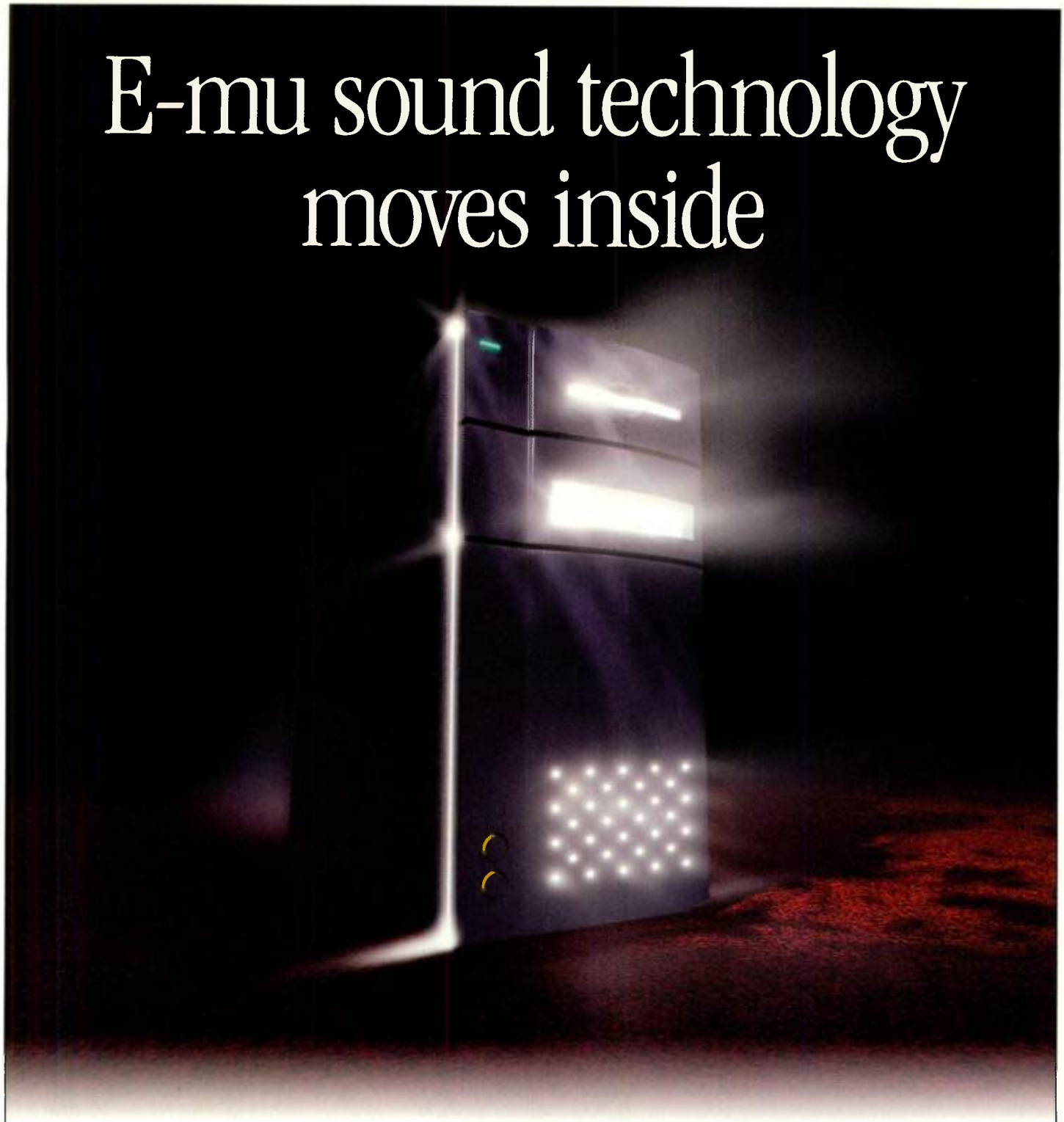

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THE PICTURE OF DEBBIE WISEMAN

Debbie Wiseman has been described as Britain's most prolific and emotionally charged film composer, with a long list of TV and cinema credits, including the recent Oscar Wilde biopic, that belies her age. BIG GEORGE pays a visit to a woman of some importance...

The high point of most media piss-ups is watching departmental accountants experimenting with alcohol and raiding the company stores for whatever booty can be found. At one party I saw a highly-paid numerical whizz kid throw up all over his boss, wet himself, burst into tears and apologise to everyone. Everyone, that is, except me, as I was busy availing myself of one copy of everything from the promotion stock cupboard — well, it's the only promotion I'll ever get, whereas the Technicolour laughing boy is now a director of one of the top record companies in the world.

Anyway, just before Christmas I was at a superior class of shindig thrown by BBC Worldwide. It was full of composers and copyright clearance people — my favourite people: one lot are who I am and the other lot are the people who send us our cheques — when who should walk in? Only the wonderful Debbie Wiseman. I knew it was her, as I'd been an avid viewer of the Channel 4 series *Backtracks*, which she presented a year or so ago. I also knew her by reputation, as the most romantic and lyrical composer alive in Europe today, and by the fact that she's done a good deal of the serious film and TV music work in this country over the last five years, her most recent high-profile soundtrack being for *Wilde*, starring Stephen Fry and Vanessa Redgrave.

We got chatting, and, as an avid reader of *Sound On Sound*, she flattered me by saying how much she enjoyed my articles. As we were getting on so well,

Stephen Fry as Oscar Wilde, supported by an enchanting Wiseman film score.

I asked if I could write one about her, and to my delight she agreed. A couple of days later I went to her little demo studio in London, to see her put the finishing touches to the music which accompanied the Carlton TV bio-documentary of the late Princess Diana, *Diana's Story*, and to hear the story behind Debbie Wiseman's career.

A LITTLE IVORY TICKLER

Debbie started playing the piano at the tender age of seven. It was during a family holiday, while all the other children were out splashing in the water, that her Mum noticed little Debbie in the hotel parlour thumping away on the piano. So the family bought a piano, and within a few years Debbie had steamed through her grades. She became a Saturday exhibitioner at the Trinity College Of Music, which is where gifted children up to the age of 16 spend their Saturday mornings — learning theory, playing in chamber ensembles, and basically getting an all-round music education of a higher standard than can be given at school. This was where she first felt the desire to compose: "When I was nine years old, when most children would be at home watching cartoons on TV, I'd be sitting in a circle with lots of wonderful musicians at Trinity. One person would start to compose a tune and the next person would add to it, and so on. It was absolutely brilliant; we all felt we were learning the craft of music in a very simple but accessible way. It was those little circles that got me really interested in composing; it seemed so easy to get a germ of an idea, a little hook, then build it up into something substantial, which is really what music composition is all about."

After doing a special A-level course at Morley College she went to the Guildhall School Of Music and Drama in London. Although the drama side of the school didn't really cross over into the music side, it did mean that there were a number of theatrical ventures that needed music. Debbie was the first person to do a joint first study of Composition and Piano, and by the end of her course she was writing and conducting music with the excellent in-house orchestra, as well ▶

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DEBBIE WISEMAN

as being musical director for most of the drama department's output. She studied composition under the tutelage of Buxton Orr, a contemporary *avant garde* classical composer who taught her the discipline of serious orchestration. "One of the most important lessons he taught me was: compose something every day, even if you throw it away, as it's important to keep your compositional sharpness. After having a couple of weeks' holiday it may seem that you come back to the manuscript fresh, but it can sometimes take a week to get back into the full flow of writing fluid music."

CHICKEN IN A BASKET GIGS

After graduating with a GGSM diploma (which allows her to teach music anywhere, if she ever so desires) Debbie fell into the wonderful world of function bands, playing top tunes at weddings, anniversaries and Bar Mitzvahs, where her most detested tune was Stevie Wonder's biggest hit, 'I Just Called To Say I Love You' (which is also, in my opinion, the worst thing he's ever done, and ever since it came out and made him a fortune everything he's released has been completely useless).

Debbie in her studio (with a camera-shy character called Big George).

But our Debbie was keen to get out of the social club scene and onto the TV screen. While at Guildhall she'd amassed a healthy body of recorded orchestral work, which she packaged up into a showreel and sent out to various people in the television and advertising world. Out of the 100 or so she sent out, she got two replies. One was from an ad agency asking her in for a chat about her music: the result was a commission for a Pringles crisps jingle — not a bad start. The other reply was from a chap called Paul Bryers, a director from Brooke Productions, who was making a programme called *A Strike Out Of Time* about the dire plight of British miners. He'd always used library music before, but was looking for something more individual. She got the job, and has subsequently completed over a dozen major documentaries, series and feature films for the company.

> "I would never replace a flute player, or any musician, with a sample, but I will quite often use an atmospheric sound and hang the orchestra around it."

COMPOSING HERSELF

By now I was up to speed with Debbie's background and influences, and the story of how she made a start in commercial music, so we began talking about the working methods and approach which have made her so successful in her chosen field. Debbie told me that there are no hard and fast rules at the start of a project: "It varies from director to director; some might call me in because they like something I've done before and they ask me what music I think their film needs. Other directors (and this is more often the case) have a very strong idea of what music they want. They've often 'temp tracked' the film themselves [*see 'Just for Atmosphere: The Temp Track' box*] and we'll spend time talking about what they want me to convey emotionally with the music. On *Wilde*, I was brought in after the film had been completely shot and the first chance I got to talk about the music they wanted me to compose was after I'd watched a rough cut at a screening. The director had temp tracked the film with music he liked from other films and music he'd grabbed from his own record collection.

AT ALL GOOD RECORD SHOPS..

There's a world of difference between a soundtrack CD and the CD of the original score. The first is pumped full of cheap-to-acquire '70s chart hits and dodgy disco remixes, whereas the second is modern-day classical music of the highest order. Sadly, this music is almost completely ignored by the likes of Classic FM and Radio 3. Debbie has three albums and a single which fall into this category, available at all good record shops.

• *Wilde*	MCI Presents (MPRCD-001)
• *Haunted*	Filmtracks/ Silva Screen (TRXCD 2002)
• *Tom And Viv*	Sony Classical (SK 64381)
• 'Children's Hospital'	BBC/BMG 74321475892; also available on *World Of Sound*, BBC (CD 33635-2)

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DEBBIE WISEMAN

Debbie: "The standard of musicians in this country is phenomenal".

▶ With the miners documentary, on the other hand, I was brought in very early and they hadn't shot any of the film yet, so I was more involved in talking about how dynamic the film was going to be, how the music would be approached stylistically, and which instruments would be appropriate for the subject. After these initial meetings I go back to my little studio and sketch out the main themes on piano. I take these back for their approval — there's no point in doing too much work at this stage, as they might hate what I've done and I'd have to go back to the drawing board."

TECHNOLOGY

Even someone like Debbie Wiseman, classically trained and using the best orchestral players to realise her musical vision, calls upon music technology to make her life a little easier. The centrepiece of her studio is a full-size Yamaha Grand Piano (not a MIDI Grand) where she composes her masterpieces. She has an IBM PC-compatible computer running *Cadenza* sequencing software for Windows, and her master keyboard for inputting information into the sequencer is a Roland JV80. She hand-writes her scores beautifully, before voicing her rich orchestrations with the aid of two Emu samplers (an E3 and an E4). An extensive library of sample CDs, including the superb Miroslav Vitous orchestral sample CDs, is used for demo purposes only, "I use these to mock up the score before I go into the studio. I would never replace a flute player, or any musician, with a sample, but I will quite often use an atmospheric sound and hang the orchestra around it. On the score to the film *Haunted*, the lead instrument was a weird percussive icy harmonic sound which I could never have got from an orchestra. Alongside I had an ensemble of 35 strings playing around the lead part."

When the basic themes for a project have been sketched out, the next stage is the so-called 'spotting session'. Debbie explained.

"In my view, this is the most important part of the process, and is where you sit down with the director and look at the film with no music at all — just dialogue, effects and burnt-in timecode (the SMPTE code display at the bottom of the screen). This is usually quite a lengthy process, as we go through the film bit by bit, deciding where the music will start, where it will finish, what it's aiming to do in that particular scene; whether it's going to creep in gradually or come in with a strong chord, whether it will tail out or crescendo into a major hit point... Is it going to be in the background to help the drama, or is it going to work against the pictures to add another dimension to the scene? After discussing every scene, I go away with a long list of cues with timecode starts and stops, and a pile of notes which I've scribbled down during the meeting — things the director has said, things I thought of as we were talking, little music sketches I've jotted down to remind me of tunes and phrases I might have hummed during the screening. I take all that away and start getting the piece arranged and orchestrated. Sometimes, if I'm brought in early in the project and they know they've got a big dramatic piece, the editor will ask for a demo of, say, a two and a half minute piece to accompany a montage of action, so that they can cut the film to the music. But usually I'll be composing to the rhythm the editor has cut the film to."

> "The ego of a film composer has to be zilch, as you can't ever be centre stage."

LONG DAYS, LIGHT LUNCHES

On a big project, the above process can take as long as a month, working from 7am until midnight, ▶

JUST FOR ATMOSPHERE: THE TEMP TRACK

More often than not a film or TV company will invite a composer in after all the filming has been completed. During the rough-cut editing stage of the process, music will have been laid down to cut the pictures to. It's there as a guide, to show where the film needs music to lift the pictures and what mood or tempo the director wants. Music for the temp track can be supplied by lame library CDs, which are available for anyone to use, and this music could be left in place for the final release version of the film or TV production — but although this would save the production company the cost of a recording budget, it's never a good idea. Why? Well, the producers of the film might use a particular piece to highlight the plight of a refugee, or to heighten the effect of a spectacular natural phenomenon like a volcanic eruption. Then the very same piece of music could quite possibly be used by Jeremy Beadle to accompany film of a dog hilariously biting off an old lady's nose.

Another source of temp tracks is major film scores, like *Schindler's List* or *Robocop*, where the rights to the music are completely unobtainable, but for the purposes of a temp track are perfect — and as it won't be going out on commercial release there's nothing Hollywood can do about it.

A temp track is only there as a guide: the point at issue for the composer is just how close a guide the director wants it to be for the final cut of the film. It can be quite daunting watching a film which you hope to compose the score for being accompanied by the work of Mozart, Mike Oldfield, John Williams, Django Reinhardt and The Orb — especially when the budget *you* have to work with will only stretch to half a dozen players and one day in the studio to record everything!

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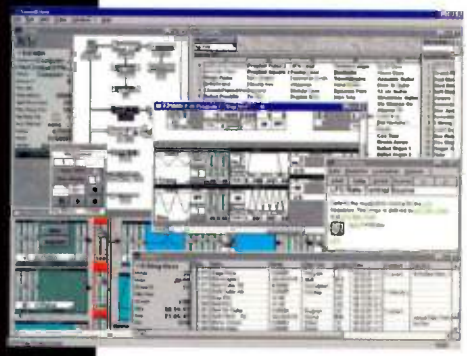

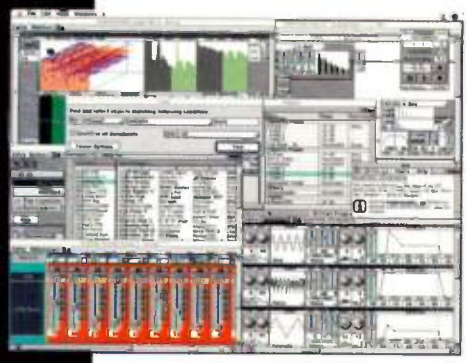

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DEBBIE WISEMAN

with a break for lunch — well, a girl has to eat. In fact, the life of a highly successful composer means being stuck in a little room for weeks on end before going into a huge recording studio for a couple of hours, with ensembles of between five and 75 musicians, to record the finished article. It's far from the glamorous life one might imagine, but then things must get easier as the success piles up. I asked Debbie whether the way she's treated by the companies who commission her work has changed over the past few years as her profile has become more and more impressive.

Debbie at CTS, during a mixing session.

"Not that I've noticed. Maybe people trust me a little more and don't seem as nervous about whether I can deliver on time because I've got a back catalogue, but they still like to be involved in the process of getting the music right. I don't think any company would accept anything unless it was good, no matter who you are. A lot of major composers in Hollywood still get their scores rejected if the producers of the film don't like them."

Debbie's own introduction to Hollywood was via the intriguingly titled, but very un-dodgy film *Female Perversions*. The film spotting was done in Los Angeles with the producer and director, but all the recording was done in London. She maintains that she didn't find too much difference between the American way of doing things and ours — except that the industry in Hollywood is infinitely bigger and there's a lot more money being thrown at the big major motion pictures. It's standard for named composers to have orchestras of 80-90 players and be given long periods of time in the studio.

The number of players Debbie uses varies considerably: "It can be absolutely anything: primarily it's dictated by what the budget will allow and then by what I feel the film needs. If the ensemble is limited, due to the budget, I'll try to be as creative as possible with the instrumentation. I'll make sure I write for the stuff you're really going to hear, the top-line instruments — sax, flute, clarinet or whatever — in their best registers, so they really sing out. Then around that I'll voice as many strings as I can afford; I feel strings are the heart of any orchestra. On *Wilde*, I used a 70-piece orchestra on four three-hour sessions, to record over 45 minutes of music."

DRAGGING MUSICIANS OUT OF BED

When most bands can't get four people together on time for a rehearsal, how on earth did Debbie get 70 musicians together? (Apart from paying them money, that is.) "I always use a fixer, Roz Colls, who runs a company called Music Matters. She not only books all the players and makes sure they turn up at the studio for 10am, but sorts out payments and does any copyright clearance there might be. For instance, in *Wilde*, there's a scene where Bosie sings part of a Gilbert and Sullivan tune from *The Pirates Of Penzance*. Now this was filmed long before I was on board with the project, but I thought it would be nice to incorporate it into the score a couple of times, to give some continuity.

"With regard to musicians, there are certain people who I always approach: Justin Pearson is

AS SEEN ON SCREEN

In addition to *Wilde*, the recently released and highly-acclaimed feature film starring Stephen Fry, and the Princess Diana tribute mentioned in the main text, Debbie has composed, conducted and orchestrated music scores for dozens of programmes, documentaries and films. The following is necessarily an abridged list of her credits.

• *Haunted*	Feature film for Lumiere Pictures.
• *Tom And Viv*	Feature film for Samuelson Productions/IRS media (nominated for a BAFTA).
• *The Good Guys*	Drama series for network ITV (winner of best original theme music of the year, TRIC awards 1993).
• *The Upper Hand*	Sitcom for network ITV.
• *Death In Yugoslavia*	Documentary for the BBC (nominated for best commissioned score, Ivor Novello awards and Royal television society awards 1995).
• *The Second Russian Revolution*	BBC (winner of best documentary series, Broadcasting Press Guild TV awards 1991).
• *Female Perversions*	Feature film for Map Films/Trans Atlantic.
• *Is It Legal?*	Comedy series for network ITV.
• *A Week In Politics*	Channel 4.
• *The Cuban Missile Crisis*	BBC (winner of outstanding historical documentary, Emmy awards 1993).
• *Postcards From The Edge*	Channel 4.
• *Tales Of The Serengeti*	PBS.
• *The Dying Rooms Debate*	Channel 4.
• *Auntie: The Inside Story Of The BBC*	BBC.
• *Seekers Of The Lost Treasure*	Discovery Channel.
• 'Cheryl's Trail' (*Modern Times*)	BBC.
• *Jackanory*	BBC title music.
• SelecTV	Station ident music.
• 'Incredible Evidence' (*Equinox*)	Channel 4.

Plus adverts for Oxfam, Procter & Gamble, Kraft Cheese and *The Sunday Observer*.

Debbie's diary is full to bursting, and just some of the programmes featuring her work in 1998 are: *Dear Nobody*, a BBC drama film starring Sean Maguire, all about a young female composer (coincidental); *Survival School*, a BBC/Discovery Channel natural history series; *Bloom*, a Channel 4 series; *Legend Of The Lost Keys*, a BBC drama series; and *Children's Hospital* for the BBC.

my string co-ordinator, and I'll tell him the line-up I want — how many first violins, second violins, violas, cellos, and so on, the sort of score it is, whether it needs strong playing or a more intimate feel — and he'll pick the best group of players for the piece, so I've got a really uniform string section. The standard of musicians in this country is phenomenal, on a par with the best there is anywhere in the world. Their sight reading is brilliant: you can write the most difficult part and they'll just read it perfectly first time."

A lot of composers use orchestrators to voice the music for the different sections of the orchestra — someone like Jerry Goldsmith will write a nine-voice score and give it to his orchestrator, who will get it ready for up to 90 musicians. Debbie does it all herself, often by hand, although she uses Coda Music's *Finale* for Windows to print out the parts, which she then has to amend and re-print. "It takes a few days to actually print out the parts for 70 players, and I'm completely paranoid about mistakes in the score, so I check all the parts over and over again, because there's no time in the studio to correct mistakes.

"Once I've completed the session and delivered the master DAT to the director, the job's done, though sometimes I'll go along to the dubbing session."

GETTING IT IN THE CAN

A couple of days later, I went to see Debbie record the music for the Princess Diana programme at CTS (one of the top orchestral studios in Europe, situated in the shadow of Wembley Stadium). She was using six musicians, as well as herself playing piano, and conducting with her eyes and the nod of her head. There wasn't a MIDI click to be heard, and I wondered whether all her sessions were so free in terms of tempo. "Not at all, but this is a very lyrical piece, so I can conduct the players as I see fit. If I do need to hit a certain point in a film, then I will tempo-map the click track at home, which means I build a sense of flow — slowing down, accelerandos, that sort of thing — into the tempo track. That way, if there is a point in the action that I need to hit I can plan in some expression and know I'll hit it perfectly every time, which I couldn't if I was conducting it wild."

Watching Debbie Wiseman create such wonderfully rich and full music with only six people, and without the use of any electronic instruments, made me realise how the ability to write great classic music is a skill bestowed only on the very elite. Yet this hard-working and talented member of that elite remains modest and unassuming about her own importance in the scheme of things: "Sometimes what works musically isn't what works with the pictures. I might want to have a huge crescendo leading up to the best part of the tune, to show it off, but that doesn't work with the film because the film requires something less dramatic at that point. The ego of a film composer has to be zilch, as you can't ever be centre stage. You're there to underscore the emotion of the film and allow dialogue room to be heard. The film has to come first." SOS

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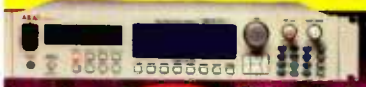

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Speakers' corner

JBL 6208 BI-AMPLIFIED REFERENCE MONITOR

Active monitors are all the rage in the project studio market at the moment. HUGH ROBJOHNS checks out a weighty contender from American loudspeaker giant JBL.

JBL have a long history in the professional loudspeaker industry, not only in the design and manufacture of drive units and systems for PAs, but also in professional studio monitors of all sizes. The Model 6208 Bi-amplified Reference Monitor reviewed here is a professional nearfield loudspeaker system intended for broadcast and recording applications.

PHYSICAL DESIGN

The 6208 is part of JBL's 4200 series of studio monitors, which currently also includes a pair of passive two-way loudspeakers, the 4206 and the 4208. These are very similar loudspeakers, fundamentally differing only in the size of bass-mid driver (of six and eight inches in diameter respectively). The 6208 is, to all intents and purposes, an active, self-powered version of the 4208.

This entire range of loudspeakers features a rather intriguing form of front baffle which JBL call a 'Multi-Radial Baffle'. The idea is to try to align the acoustic centres of the two drive units in the vertical plane, so that sound waves emerging from both drivers travel the same distance to the listener — that is, they are *time-aligned*. This is particularly important in the crossover region of the unit, where both drivers are contributing to the sound output, and it's claimed that the design helps to improve stereo imaging and perceived frequency response around the crossover region.

The relative dimensions of the two drivers mean that, to achieve a correct time-alignment between them, the woofer must be mounted forward of the tweeter, so that the voice coils of the two units lie directly above one another. The concept is certainly not new — many of the larger KEF and B&W monitors designed in the '70s and '80s placed the mid and high drivers in separate enclosures stepped back from the front of the bass cabinet, to achieve exactly the same effect. However, these separate stepped enclosures had hard edges, which often caused acoustic diffraction in an unhelpful way, and JBL have attempted to overcome this shortcoming by making their front baffle in a smooth and curvaceous form. The easiest and most descriptive way I can find to describe the visual impact of JBL's 'Multi-Radial Baffle' is to liken it to the profile of an extremely well developed beer-belly!

There is also an elliptical basin around the tweeter to aid in HF dispersion. The unusual baffle shape results in the voice coil of the bass unit being directly below that of the tweeter, thus achieving the desired time-alignment, although, because of the profiling, the woofer is not itself vertical, but is tilted back slightly.

TECH TALK

The drive units in the 6208 are both made by JBL: the woofer is a 200mm unit with a long-throw voice-coil design and fully shielded magnet assembly, and the 25mm tweeter is a gold/titanium hybrid dome unit. (The other 4200 series monitors manage with a straight titanium dome device.) A protective grille is fitted in front of the bass unit, but this can easily be pulled away (a cut-out is provided on the baffle to make the task very simple), and the tweeter has a metal bar to provide some level of physical protection.

The drive units are rated continuously at 75W on pink noise, with a peak capability of 300W, so they are more than capable of providing the kind of level anyone could tolerate in a nearfield situation. The loudspeaker is quoted as having an overall frequency response of 60Hz-20kHz, and is claimed to be capable of producing useful energy (at -10dB) down to 38Hz.

The black-stained wooden cabinet measures exactly the same as JBL's 4208 monitor, at 451 x 286 x 229 mm (H x W x D) and has a large, 65mm undamped port at the rear of the cabinet, just below the centre. These speakers are a little on the large side for nearfields, and although they will sit quite happily on the meter bridge of most large studio consoles, semi-pro and home studio owners will probably find them easier to use as midfield ▶

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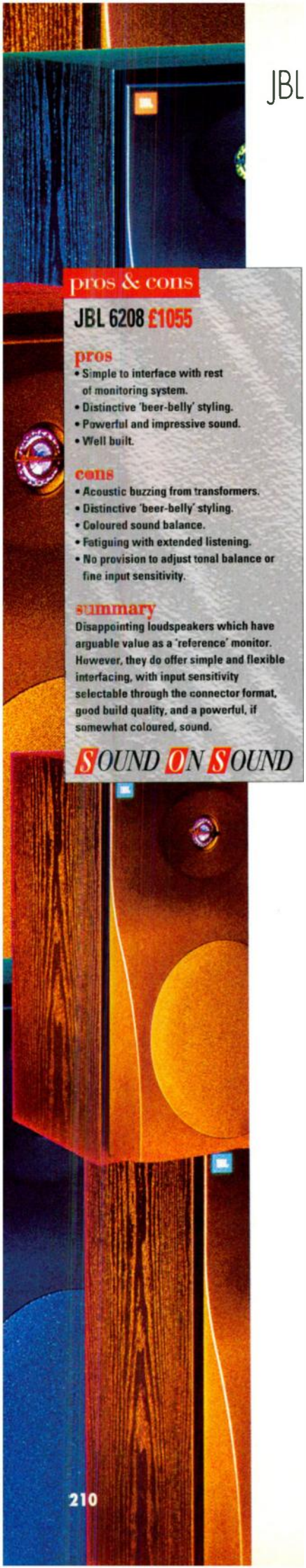

pros & cons

JBL 6208 £1055

pros

- Simple to interface with rest of monitoring system.
- Distinctive 'beer-belly' styling.
- Powerful and impressive sound.
- Well built.

cons

- Acoustic buzzing from transformers.
- Distinctive 'beer-belly' styling.
- Coloured sound balance.
- Fatiguing with extended listening.
- No provision to adjust tonal balance or fine input sensitivity.

summary

Disappointing loudspeakers which have arguable value as a 'reference' monitor. However, they do offer simple and flexible interfacing, with input sensitivity selectable through the connector format, good build quality, and a powerful, if somewhat coloured, sound.

SOUND ON SOUND

units on stands arranged behind the desk.

Built into the loudspeaker cabinet at the top of the rear panel is a self-contained, fully shielded amplifier and active crossover pack, which makes the 6208, at 13.3kg, rather heavier than its passive sibling the 4208, at 9.3kg. The two 50W discrete-circuitry power amplifiers have apparently been designed to use very little negative feedback, and JBL claim they have extremely low distortion and no slew-rate limiting. A reasonably large heatsink provides cooling for the amplifiers, but the units run only moderately warm in use.

The line-level active crossover integrates the two drivers at 2.6kHz but, unusually, there are no facilities to fine-trim the output level at either end of the frequency spectrum, nor to adjust the input sensitivity. Having said that, the nominal input level is selectable between the professional +4dBu and semi-pro -10dBV 'standards', depending on which form of input connection is used. The rear panel carries a Neutrik 'Combi-jack' XLR socket, and JBL have arranged for the electronically balanced XLR input to provide a nominal sensitivity of +4dBu, whilst the central jack socket input is designed for -10dBV signals.

Also on the rear panel are an IEC mains inlet, a suitably identified fuse holder, and a rocker-style on-off switch — the mains input voltage is fixed at 250V and cannot be altered by the user. There are no indicators on the front panel to show when the loudspeaker is powered, nor when the amplifiers are being stressed (ie. over-temperature or clip warning indicators). I was unable to determine whether there is any form of protection circuitry incorporated in the amplifier pack, but the JBLs proved more than capable of handling everything I asked of them, including a short period of deliberate abuse with a very bass-heavy signal (all in the name of research, you understand).

HUMMING ALONG

The first thing that struck me when I powered up one of the monitors (with nothing connected to its input) was a rather obvious buzz and a little hiss. The hiss could only be heard at close quarters from the tweeter, but the buzz was quite loud and could be heard clearly throughout the control room, even above the racket from the obligatory studio Mac computer. The hiss was nothing to worry about, but the buzz definitely was; thinking that it was picking up some kind of interference on the unterminated input (although its CE marking should guarantee that it would not be susceptible to such problems, of course), I plugged the loudspeaker into the desk monitoring (which I already knew to be completely clean). Unfortunately, it still buzzed and when I powered up the second monitor it performed in exactly the same way, with the same buzz.

To try to isolate the source of the noise (was it related to the mains or signal inputs?), I unplugged the monitors from the mains outlets, and before the amplifiers died I discovered that the speakers became delightfully buzz-free. Further investigation suggested that the buzzing was not emanating from the woofers, as I'd first assumed, but was actually transmitted acoustically through the rear port. It appeared that the mains transformers in the amplifier packs were the source.

Just in case the local mains power feed contained some nasty harmonic signal which was upsetting JBL's transformers, I tried listening to the speakers at different times of the day (and night), at the weekend as well as during the week, and at a different location 20 miles away — but all to no avail. The 6208s, as supplied for review, buzzed. A second pair summoned from JBL's office in the UK also hummed. They weren't quite as bad as the first pair, but the buzz was still completely unacceptable and would be very obvious in all but the most noisy control room environment.

Both sets of speakers were clearly 'demo units', but even so I would have expected a manual; in fact, neither set was supplied with any kind of handbook, and the second set didn't even come with mains leads.

LISTENING TEST

Disregarding the buzzing (as far as it was possible to), the 6208s actually produce quite a nice sound. In my experience, JBL speakers sound like New Yorkers speak — they always seem to be a bit hard and brash. However, I believe that there's a trend within JBL to produce a more modern sound quality, and certainly the 6208s manage to produce wide and well-defined stereo images. They're capable of

> "Overall, the JBL 6208s were something of a disappointment to me. The acoustic buzzing is obviously inexcusable..."

stable imaging over a useful working area, and create a reasonable sense of spaciousness on suitable recordings. In fact, initial impressions are very favourable — these speakers have the kind of presentation which is immediately exciting and involving — the treble is crisp and well extended (with a typical metal-dome precision) and, apart from a little 'bloom', the bottom end is quite respectably controlled too.

Compared to my normal references (professional PMC AB1 transmission line monitors and PMC TB1 nearfield monitors, Tannoy Little Reds, and BBC-designed LS3/5As), I felt the JBLs were a tad 'bloated' in the lower mid-range. Irrespective of the sound source, I kept wanting to tweak out a little bit in the 400-800Hz area — maybe only a dB or two — and this did contribute to my impression

of a slightly muddy or thick sound. Thinking the speakers might be sensitive to placement, and that this was the cause of the perceived bulge in the frequency response, I experimented at some length, but apart from the fact that they don't like to be close to a rear wall (because of the rear-firing port), the kind of sound obtainable from the 6208s appears to be largely independent of their positioning — the best results were obtained in 'free-space', well away from walls and with a clear, direct path to the user's ears.

Reviewing loudspeakers is never easy, because the perfect loudspeaker has not yet been invented, and even if it was in development you'd find it hard to get a dozen people to agree on what 'perfect' means! Every designer chooses a different set of compromises and every listener has their own particular preferences. My comments must be taken with the understanding that they are purely personal opinions, albeit given with the benefit of many years of listening and working with a wide variety of professional-quality monitoring systems.

To my way of thinking, a professional monitor should be as faithful to the original sound as possible, so that meaningful decisions can be made about positioning microphones and processing their resulting signals. However, in my experience, many American loudspeakers (and JBL in particular) seem to have a noticeably coloured, and therefore inaccurate, tonal balance. I found that JBLs 6208s initially produced an impressive and exciting sound, tending to flatter most sources, and that everything sounded almost larger and crisper than in real life. However, over extended listening periods I found the loudspeakers to be quite fatiguing to work with, and they produced a bit too much coloration to be classed as true reference speakers — especially in the lower mid-range. And then there's the buzz, which masks subtle low-level signals completely and could result in you not spotting similar flaws in the recording itself!

The 6208s are capable of producing a lot of sound (I hardly think anyone would have cause for complaint on that score), and they are also quite analytical (probably thanks to the metal-dome tweeters). The tiniest clicks and ticks on a rather dodgy DAT recording were easy to spot and, apart from the slight lower-mid 'bloom', the bottom end is surprisingly powerful and reasonably well extended. However, the bass had an almost artificial quality and I found it very hard to make accurate assessments when equalising at the bottom end of the spectrum.

CONCLUSION

Overall, the JBL 6208s were something of a disappointment to me. The acoustic buzzing is obviously inexcusable, and the fact that both speakers in both sets suffered the same defect does not bode well — I think a redesign of the power supply is urgently required. The speaker's tonal balance, whilst nodding in the direction of better accuracy and fidelity, still seems quite coloured, and because of that I would hesitate to choose these as a main monitoring system. However, the 6208s might make a good choice for a replay system where you want to create an impressive, flattering, and involving sound.

Despite my overall negative tone in this review, the 6208s do have some saving graces. They are very easy and convenient to use, they seem to be well built and should prove very robust, and they look the business. SOS

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BAY WATCH!

ALL ABOUT PATCHBAYS

PAUL WHITE follows up a few leads and discovers they all end at the patchbay.

Every couple of years *SOS* covers the subject of patchbay wiring, and for a while the phones stop ringing — at least with patchbay enquiries. As time passes, the phones start ringing again as new readers discover patchbays and wonder how to set them up, and over the past few weeks there have been enough of these calls for me to justify revisiting the subject. Most of the patching in smaller studios involves analogue, line-level signals, so this is what I'll be talking about here, though we'll also be covering digital patching in the coming months.

SOCKET CENTRAL

Patchbays are relatively simple in concept — their job in life is to bring all those obscure line inputs and outputs that are usually tucked away behind mixers or dark, dusty rack cabinets to a central, easily accessible location. Instead of having to squeeze behind your mixer every time you want to make a change, you simply use a short patch cord to join the required pair of sockets on the patchbay.

Just as no two studios are exactly the same, so it is with patchbay systems, though all follow certain basic rules. You first need to sit down with a piece of paper and plan out your requirements. In most cases it simply isn't practical, or even desirable, to bring every single connection to a patchbay — if something isn't likely to be changed, leave it wired conventionally and only use a patchbay where you're likely to be making regular changes. For example, you may have a compressor that needs to be patched into different mixer insert points, or an effects unit that is frequently patched into different places, and connecting these to a patchbay obviously makes sense. Similarly, you may need access to your stereo tape machines, because although you'll be mixing onto them most of the time, you may occasionally need to copy tapes from one machine to another, or feed a DAT tape back through the mixer. Again, bringing their inputs and outputs to a patchbay makes the job easier.

When it comes to your mixer, insert points may or may not be easily accessible, depending on the mixer's layout. However, the vast majority of project studio mixers have TRS (stereo) jack insert points, which means you need a special Y-lead to connect to them. Using a patchbay in this situation can make your life easier, though you'll still have to buy or make up a set of Y-leads to connect up the patchbay in the first place. (See *SOS* Mail Order P.283). Note, that although console insert points use the same sockets as, say, stereo headphones, they are not stereo. The TRS (Tip-Ring-Sleeve) jack socket is used simply because it has enough contacts to supply a signal output, a signal input and a signal screen. The stereo jack plugged into the insert must be wired to two separate mono jack leads, as shown in Figure 1. This explains the term Y-lead. ▶

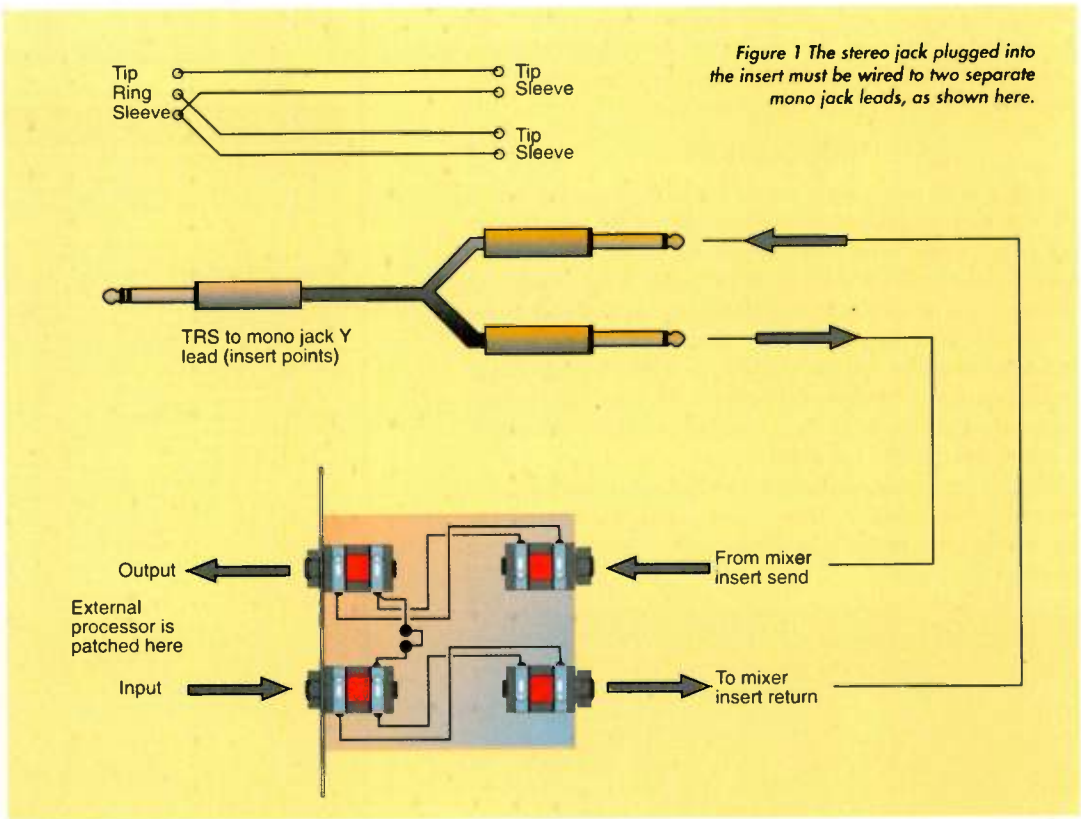

Figure 1 The stereo jack plugged into the insert must be wired to two separate mono jack leads, as shown here.

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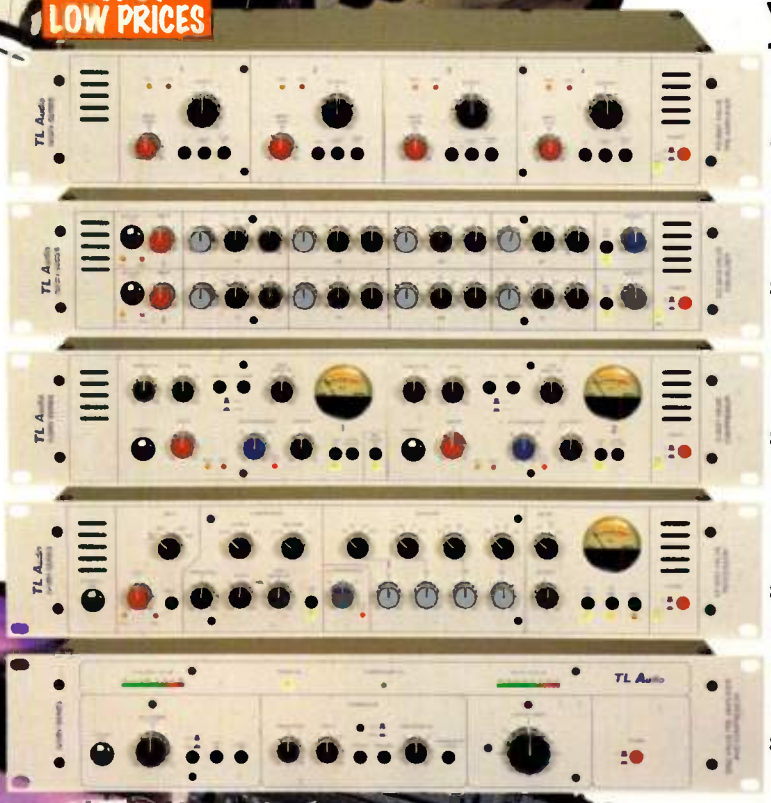

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ALL ABOUT PATCHBAYS

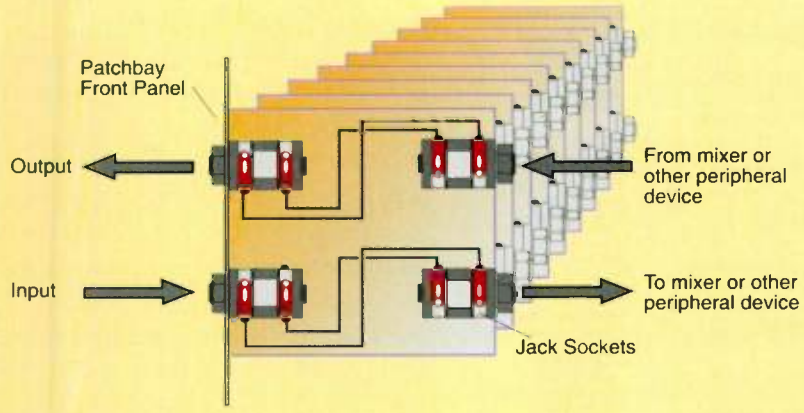
While patchbays are reasonably reliable, they're not as reliable as a solid piece of wire, so if your console has six effects sends and returns and you only have three effects units, it might make sense to leave these permanently connected. You may want to do something different once in a blue moon, but crawling round to the back of your rack with a torch once every six months isn't too much of a problem. It's up to you to decide the point at which wiring a patchbay becomes more trouble than the occasional visit to the back of your rack. In a typical small studio, mixer connections you might consider taking to a patchbay would be:

- Line inputs
- Insert points
- Aux sends
- Aux returns
- Stereo mix output
- Studio headphone feed

You might also want to take some of your mixer's monitor inputs to the patchbay, to be used as spare line-ins when you mix. If you need to record a signal directly to tape without going through the mixer, you could also include the group outs and multitrack machine inputs in your patchbay plan, but in most instances, feeding a signal to your recorder (from a mic preamp, for example) via a group insert return is clean enough.

The ins and outs of your outboard and stereo recorders could be brought to the patchbay, and don't forget any side-chain or key inputs that you might want to access. Some of these may need to be wired in a special way, so I've covered unusual wiring requirements at the end of this article.

Figure 2: Non-normalised patchbay.



NORMALISATION

The simplest patchbay is one that acts like a bunch of extension cables to put your sockets within reach. For the purposes of the smaller studio I'm going to assume that standard jacks are being used; the smaller 'Bantam' jacks tend only to be used in pro studios. Those with balanced studio systems can use conventionally wired TRS (stereo) jacks, while unbalanced systems would need regular mono jacks. Most project studio mixers use unbalanced insert points even if everything else is balanced — if your console insert is a single TRS jack, it's unbalanced. This fact doesn't usually present a problem, but you do need to consult the manuals for any balanced outboard gear you have, to find out how to wire it for unbalanced operation.

The most convenient style of jack patchbay is the one that also uses standard jacks at the back to make the permanent connections to your mixer and outboard equipment. You can buy hard-wired versions where the cables are soldered directly to the back of the patchbay, and this is slightly better from the reliability point of view. But it's not so convenient or flexible, and you have to enjoy soldering. One exception to this is the patchbay made by Neutrik, which uses solderless connections to clamp the stripped wire ends.

The simplest job a patchbay can do is providing remote access to equipment inputs and outputs. In this context, each patchbay socket acts as an independent extension lead connected back to the

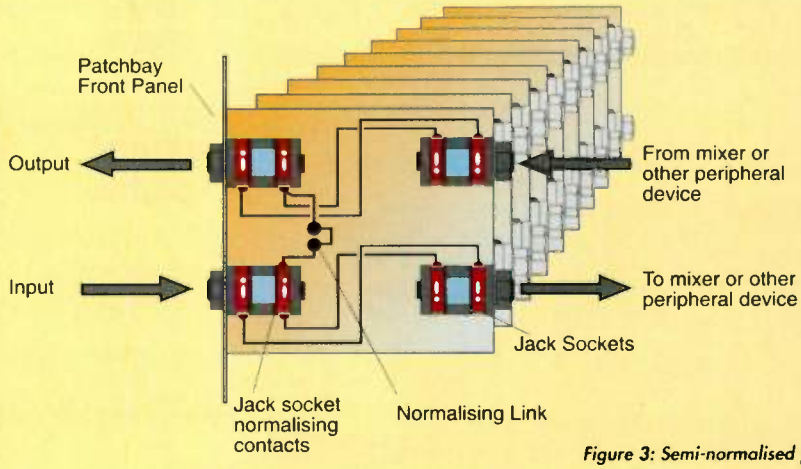


Figure 3: Semi-normalised patchbays.

KEEPING IT CLEAN

When deciding on what type of patchbay to buy, bear in mind that its contacts will need to be cleaned from time to time, so make sure you can get at them. This is particularly important in the case of normalised patchbays, as the normalising contacts are prone to picking up dirt and becoming unreliable with time. Treating them with a contact enhancer before use is a sensible measure and can greatly extend the time between cleanings. Non-normalised patchbays may be cleaned simply by spraying contact cleaner onto a jack plug and then wiggling it around in the offending socket.

3

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"The simplest patchbay is one that acts like a bunch of extension cables to put your sockets within reach."

relevant equipment input or output. There is no connection to any other socket on the patchbay. Such an arrangement is known as 'non-normalised', for reasons that will become evident shortly. Figure 2 shows the inputs and outputs of an effects unit wired to a non-normalised patchbay.

Things get slightly more complicated when it comes to console insert points (or compressor side-chain insert points), because when there's nothing plugged into the patchbay, you need the insert send to be connected to the insert return. If this were not the case, the signal path would be interrupted unless a patch cable were used to join the send to the return. To get around having to use lots of patch cables simply to maintain a normal signal flow, another type of patchbay, known as 'normalised', is used. The insert jacks in a mixing console are already normalised, in that the socket features a pair of sprung switch-contacts that automatically route the insert send directly to the insert return if no jack is inserted. As soon as you plug in a jack to connect to your patchbay, this normalising contact opens. You need to duplicate its function on the patchbay.

A normalised patchbay uses exactly the same type of internal switch contacts as the ones on your console insert points; these link the upper and lower sockets in any pair if nothing is plugged into the front of the panel. However, it can be useful to be able to take a signal from an insert send without breaking the signal path, something you might want to do if you need to split a signal for any reason. To facilitate this perfectly reasonable option, most patchbays are semi-normalised rather than completely normalised. This is actually simpler than it sounds; when nothing at all is plugged in, the patchbay output (insert send) is connected to its input (insert return), so the circuit is completed by the normalising contacts. If a jack is plugged into the output only, the input still remains connected to the output, but whenever a jack is plugged into the input, the signal path is broken. Figure 3 shows how the normalising contacts work in a typical patchbay, where the lower socket is the input and the upper socket is the output. This is the standard convention for patchbays.

The method of normalising I've just explained gives the best of both worlds, as it allows signals to be split off from an insert send point, or external effects and processors to be patched in using both the insert send and return. The term 'sniff and break' is sometimes used to describe this type of patchbay: plugging into a patchbay output socket allows you to 'sniff' or split the signal without affecting the existing signal flow, while plugging into the patchbay input breaks the signal flow.

RESUMING NORMAL SERVICE

Patchbays invariably comprise two rows of jack sockets, one above the other, and the number of socket pairs may be anything from 16 to 24, depending on the model. Clearly, manufacturers don't want to have to build both non-normalised and normalised versions of the same product (see main text for an explanation of these terms), so they invariably include some way of changing individual pairs of sockets from non-normalised to normalised operation. This means that some patchbay sockets on the same patch panel can be normalised and others non-normalised if required. A number of manufacturers use an individual circuit board to hold each pair of sockets (with a further pair for the rear connections), and all you have to do if you need to swap from normalised to non-normalised operation is remove the circuit board and put it back in the other way around, so that the rear sockets are now at the front. Other methods of changing from normalised to non-normalised operation include tiny switches, jumper links, or printed circuit pads that can be linked by blobs of solder.

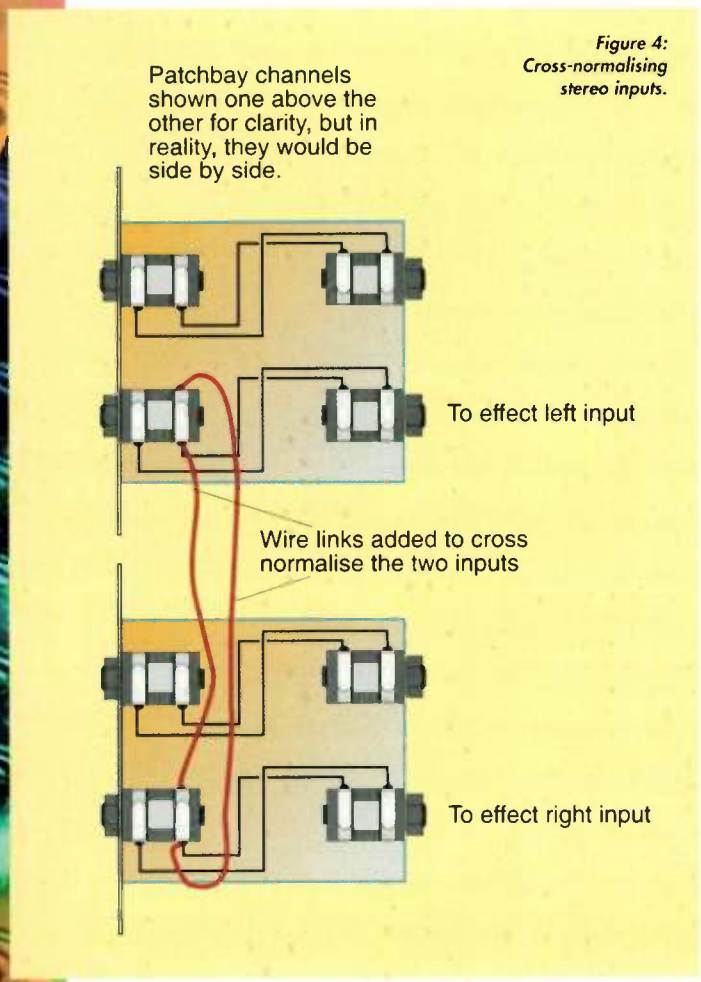

Figure 4: Cross-normalising stereo inputs.

ROUTING DECISIONS

As emphasised earlier, you have to decide which signal routes to connect via a patchbay and which to leave permanently connected, without a patchbay. It's generally best to bring all the console channel, group and master insert points to a semi-normalised patchbay, but if you don't want to wire up all the channel inserts, at least make sure that you can access all the channels used by your multitrack, plus a few extra channels for microphones, when recording. You may also decide to fit a normalised patchbay between the console and multitrack machine, as this will enable you to use 'voice channel'-type processors or DI boxes to feed signals directly to the multitrack without involving the mixer ▶

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"A good patching system represents a considerable investment, both in money and in assembly time, so it pays to get it right first time."

— though, as pointed out earlier, you can get to your recorder fairly directly by feeding the DI box or preamp via one of the group insert returns.

Non-normalised patchbay sockets are simply extensions to existing inputs and outputs, so you could use them to connect the ins and outs of all your outboard gear and stereo tape machines. However, this isn't the most effective way to work, as you may end up with lots of leads plugged into your patchbay all the time, just to connect your tape recorder to your console. If something is normally connected to one place, normalised sockets may allow you to do it more effectively. For example, in my own setup, normalised sockets are used to connect the DAT machine to the console tape ins and outs, but I can still access the tape ins and outs by plugging directly into the front of the patchbay. This breaks the contact joining the tape machine to the mixer and allows me to record to or from another source when necessary.

Use good-quality screened leads to wire up your patchbay, and keep the leads as short as practical, while still leaving enough slack to accommodate future changes. Foil-screened cable is good, as it's easy to wire, stiff enough to keep it's shape, and fairly thin. Tape machines or hard disk multitracks may be connected by individually screened multicore if preferred.

The patchbay needs to be close to your console, and if you can arrange for the patchbay to face forward in your rack, rather than upward, you'll have less problem with dust accumulating in the sockets. Keep all signal cables away from mains leads wherever possible, and where they must cross, making them cross at right angles will keep induced hum to a minimum.

For the patch cables you'll need to plug into the front of the panel, choose a flexible, non-kinking cable or buy ready-made leads. If possible, use an assortment of colours so that you can keep track of what's plugged where. Also get twice as many as you think you'll need, because that still won't be enough! If you use balanced patchbays, obtain both balanced and unbalanced patch cables, and make sure they look sufficiently different, so that you don't get them mixed up.

SPECIAL CASES

So far I've covered all the basic patchbay connections, but there are some oddball situations that may have you scratching your head. For example, what happens if you have a gate with a key input that becomes active as soon as you plug in a jack? If you connect this to a patchbay, the key input will be permanently active, and there's no easy wiring dodge to get around this. Fortunately, most reputable gates, such as the omnipresent Drawmer DS201, have a front-panel switch to activate the key input. If you have a model that won't play ball, you'll have to resign yourself to visiting the back of the rack once in a while.

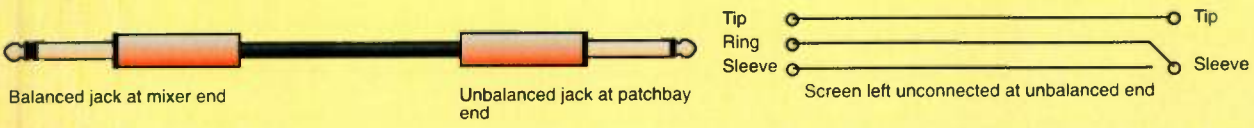
Another situation that you can do something about is the effects unit that has stereo inputs, but allows you to use it in mono by only plugging in one input. As soon as you connect both its inputs to a patchbay, it thinks you want to send it a stereo signal, so now if you send a mono signal to just one of the inputs, you may find only one channel works properly. To get around this, you need to create your own cross-normalising system between the two adjacent sockets handling the effects unit inputs, as shown in Figure 4. This simply involves soldering two short wire links, as in the diagram, so that when either of the inputs is used on its own, the signal is also linked to the other input jack via the socket's normalising contacts.

ALL PATCHED UP

In all but the smallest recording setup, a patching system is pretty much essential, and even if your studio is based around a computer with a soundcard or two plugged into it, a patchbay is still useful for converting all those horrid mini-jacks and phonos to standard quarter-inch jacks. But even given the merits of a patchbay, there's a valid argument in favour of making as many permanent connections as you can, to cut down on the number of plugs and sockets in the signal path. The connections in normalised patchbays always become intermittent eventually, so don't buy the cheapest of this type, or you may find it causes trouble sooner rather than later. The quality of a non-normalised patchbay is less critical, but it still pays to get something decent.

There can be advantages in connecting even an unbalanced patchbay to a balanced line input using balanced cable — it provides improved immunity to ground loops, for one thing. (See Figure 5 for how to do this.) Avoid the models of patchbay that have a common earth connection joining the ground or cold contacts of all the jack sockets together, as this can aggravate ground loop problems. Most importantly, plan your system properly before you start and leave room to expand it when your studio expands. A good patching system represents a considerable investment, both in money and in assembly time, so it pays to get it right first time. SOS

Figure 5: Unbalanced to balanced connections.



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MOOED MUSIC?

MIDIMAN FLYING COW D/A AND A/D CONVERTER

Many musicians now have digital audio in their studios, so Midiman have decided to help them interface cleanly to the outside world, with the bizarrely named Flying Cow. MARTIN WALKER thinks it cud be a winner...

I'm not quite sure why Midiman called this the Flying Cow. Certainly it stands on four feet, has an input end and an output end, and you can use it to milk every last drop of quality from your audio signals, but I suspect that the real reason may be somewhat different. Fortunately it's not a load of old bullocks, and should prove an extremely useful purchase for many people, since it provides high-quality 20-bit A/D and D/A converters on the analogue side, along with both AES/EBU and S/PDIF digital Ins and Outs for digital transfers. It also features all those little touches that tend to disappear when you opt for a completely computer-based system — there are hardware A/D level meters and an LED readout of sample rate.

The target purchaser is likely to be anyone who wants to improve the quality of an existing digital audio setup. A lot of people suffer (unfortunately not in silence) with audio interference inside their computers. In the last few months, more PCI soundcards with external converters have been appearing, for both Mac and PC use, but that doesn't help those who already rely on indifferent internal converters, and who would like to improve their audio fidelity. If you have a digital output available on your soundcard, attaching this to the digital input of the Flying Cow and using its D/A converter should boost your monitoring quality considerably.

For digital recording, unless you need simultaneous multitrack recording facilities (for live ensemble work, or when recording drums) you may only really need one high-quality A/D converter. You can then route its digital output through to the digital input of a soundcard inside your computer. Once in digital form your music can stay that way until it is mastered to CD, since it is possible for the rest of the audio chain to remain in the digital domain. This means that the A/D converter is normally the weakest link in the chain, as its quality will determine what ends up on your hard disk.

In the twilight world of mixed analogue and digital setups, handfuls of D/A converters may be used to attach external analogue effects. However,

for final monitoring of your digital data before burning a CD, you only need a single high-quality D/A converter, and you will be using this to determine the balance of your final mix. Professional studios may pay thousands of pounds for the best converters to use in these two key roles. Even if you're currently using the converters from your DAT mastering machine for external recording and monitoring of digital signals, so many advances have been made in converter design over the last few years that you may well find that these converters from Midiman sound a bit better, and maybe several bits better.

BROWSING

For the benefit of the generally reserved UK reader, I must stress that although the top panel of the Flying Cow does feature a large graphic of the aforementioned animal performing aerial activities, once you place the free-standing desktop case (half-rack width) alongside other equipment, this graphic is likely to disappear. The front panel is comparatively restrained, with only a 1-inch cow in evidence, and thus should keep your sophisticated studio image intact. From right to left, the front panel also has a power switch (for the wall-wart supply, alas), an Analog (sic) Input Level control (for setting up recorded levels), and a pair of A/D input level meters (Left and Right), each with six LEDs indicating -60dB (signal present), -20dB, -10dB, -6dB, -3dB, and Clip. Next there's a Mode Select switch, which, when repeatedly pressed, will cycle the unit through all available sample rates and digital formats. These are indicated by the last front-panel indicators, which consist of a set of four LEDs showing A/D sample rate (48, 44.1 and 32kHz, and Ext, which syncs to an external signal), a pair of LEDs labelled Digital Format (AES/EBU or S/PDIF) and a single LED labelled D/A Valid, which lights up when incoming digital data is detected at the selected digital input socket.

On the back panel (from left to right) there's the 9V AC power socket for the wall wart, then a pair of analogue outputs on those clever dual XLR/jack sockets, to provide balanced outputs on the XLR part, and unbalanced on the inner quarter-inch jack socket. The input socket pair uses the same approach. The remaining four sockets are S/PDIF coaxial in and out (on phonos), and an AES/EBU in and out (XLR male/female pair). The manual explains every function well, and has a useful Troubleshooting section and even some diagnostic tests, using loopback cables between each pair of digital outs and ins, to check for correct operation.

A LOT OF BOTTLE

The Flying Cow's converters are full 20-bit devices, and if your hard disk recording system allows 20-bit recording, you can both record and play back at this bit resolution. If you're operating at lower bit-resolutions, your software will discard the extra bits accordingly. I started out with an obvious application — using the Flying Cow's D/A with the S/PDIF output of the Creative Labs AWE64 Gold card, running Seer Systems' *Reality* synth. As expected, the difference was remarkable. With the Flying Cow patched into my mixer, every sound emerged as clean as a whistle, with the background noise dropping 15 to 20dB over the normal AWE64 analogue output. The software resonant filters sounded crisper as well, but this is hardly surprising, since the Flying Cow is more than double the price of the Gold card. One warning: if you switch between AES/EBU and S/PDIF using the Mode Select switch and there's no input connected, you will get some erroneous digital noises. Keep the levels low until the digital stream has been detected, and also when powering up or down. The Flying Cow should be able to deal with any incoming digital data between 1 and 50kHz.

Next I tried recording through the analogue input, and playing back again through the Flying Cow converters. The sound was excellent — clean, quiet, and a model of clarity. However, I did notice that the individual LEDs in the A/D level meters had noticeably different brightnesses, which also changed dramatically as adjacent segments came on, often making it look as if two segments were lighting together unless I looked carefully.

Since I still had the Event Gina soundcard (reviewed in *SOS* December 1997) installed in my PC, I replayed the same digital material through both sets of D/A converters, and frankly I could detect little difference between the two. However, my ears weren't deceiving me, since when I whipped off the top cover of the Flying Cow its D/A chip turned out to be an identical Crystal Delta-Sigma 128x oversampling device (CS4327) to the four (one for each stereo pair) used by the Gina. On the A/D side, both devices again use the very similar CS5334/5335 chips. I made my rough-and-ready noise measurement as usual, by recording using the analogue input of the Flying Cow, and patching its S/PDIF output to the S/PDIF input of the Gina, so that I could record background noise levels. These measured -84dB (a very acceptable result).

SUMMARY

There's no point in buying a Flying Cow if its performance is an udder disappointment, but fortunately it isn't. The 20-bit converters provide a clean sound with more than enough dynamic range for most applications. The provision of coaxial S/PDIF as well as AES/EBU sockets should help you interface to plenty of devices, although there are still many digital recorders using optical Toslink connectors (like my Sony DAT machines) which will not be able to benefit from this box.

The price is good considering the specification — even mass-market hi-fi D/A converters cost at least £150, and the Flying Cow has a lot more than double this inside the box. If you do only need a D/A converter, Midiman have also just released the Flying Calf, for a mere £129, and this should prove a very useful little box for many people. At these bargain prices I expect both mother and son to do well. SOS

info

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pros & cons

MIDIMAN FLYING COW £349

pros
- Clean, quiet converters.
- Both AES/EBU and S/PDIF standards supported.

cons
- No optical connections.
- Accurate but sloppily designed level meters.

summary
A pair of high-quality 20-bit converters in a handy little case for a good price. Especially recommended for PC soundcard users looking for better quality sound.

SOUND ON SOUND

CONDENSED SPEC

- D/A Converter: 20-bit delta-sigma with 128x oversampling.
- A/D Converter: 20-bit delta-sigma with 128x oversampling.
- A/D Sample Rates: 48kHz, 44.1kHz, 32kHz and external word clock.
- D/A Sample Rates: Automatically locks to any incoming data.
- Dynamic Range: 99dB (A-weighted) for both input and output.
- Frequency Response: 20Hz-22kHz +/-0.5dB.
- Balanced A/D Input Level: 1.4V RMS (Max) to 8.0V RMS ('0').
- Unbalanced A/D Input Level: 0.7V RMS (Max) to 4.0V RMS ('0').
- Full-scale output level: 4V RMS balanced, 2V RMS unbalanced.

While Roland's A70 in its basic form is a well-equipped but dumb controller, it can metamorphose into a Roland JV-style synth, a General MIDI synth, or a piano at the drop of an expansion board. PAUL WARD has a controlling interest...

take control

ROLAND A70 EXPANDABLE CONTROLLER KEYBOARD

There can be little doubt that Roland's 88-note A90 master keyboard has won quite a few friends since its release in late '96. The robust build quality, the feel and response of the piano-weighted keyboard, and the optional expandability, in the form of high-quality Voice Expansion Boards, were a combination that made it hard to ignore. Roland have now chosen to bring similar operational features and expandability to a slightly shorter 'synth'-type keyboard in the form of the A70. But the A70 has an extra trick or two of its very own...

The overall layout of the A70's control surface is very much in keeping with its older stablemates, particularly the A90 (reviewed in *SOS* September 1996). Indeed, with the notable exception of the 'Panic' and sequencer control buttons, which are over on the right-hand side of the front panel, the position and function of the switches and controls is nearly identical. Gone, however, are the JD800-style buttons of the A90, to be replaced with a slimmer variant, leaving more room for panel legending. Happily, all of the important buttons retain their integral LEDs, which greatly assists in programming, and there are two adjacent backlit LCDs: one large 3-digit display, and one 2-line x 17-character display.

PLASTIC FANTASTIC?

I found myself somewhat perturbed by the build quality of the A70. Although the casing has a good, solid metal base, much of the upper surface, including the end-cheeks, is made from moulded plastic. The review model was already showing signs of a couple of knocks in transit, and I doubt that life on the road would be any more forgiving. The highest and lowest keys also seem a little exposed above the plane of the end-cheeks. For normal studio use, or the odd gig down the Frog and Artichoke, I doubt that these points would be of any major concern, but I would have some concerns about subjecting this machine to an extended touring schedule.

On the positive side, I particularly liked the 76-note keyboard, which features Roland's implementation of weighted synthesizer action. The feel of Roland keyboards often appeals to me, but this is one aspect of a master keyboard that needs to be determined by the individual, since one player's "light and responsive" is another player's "soft and spongy". I was also taken by the textured black keys, reminiscent of the old Ensoniq EPS.

Roland have equipped the A70 with pitch and modulation wheels in addition to their traditional bender lever — although the bender lever gets the better of the two sites, to the immediate left of the keyboard. As one who has spent many years ▶

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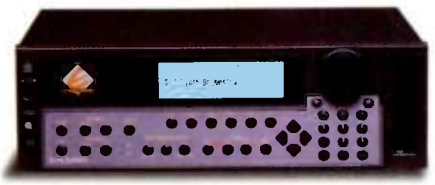

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pros & cons

ROLAND A70 £999

pros

- Vast range of control options.
- Remote keyboard facility.
- Sequencer controls.
- Expandable with optional boards.
- Useful patch map facility.

cons

- Plastic casing may not be ideal for heavy gigging.
- Small screen.
- Some operations can be confusing.

summary

A very powerful and well-specified master keyboard with serious expansion options. Requires some patience to get to grips with at first, but rewards perseverance. Professional gigging musicians may be put off by the less than tank-like build quality, but this must be weighed against the asking price. If you're looking for a controller keyboard and regularly use sequencers in your work, you'd be unwise to ignore it.

SOUND ON SOUND

▶ flipping between wheels and levers, both in the studio and on stage, I'd say that each approach has its merits. For pitch-bending, the lever is my preferred choice, whilst for modulation I would rather have a wheel. At least here I have the choice, even if it means having to stretch my left hand over a little further than I would like.

The A70 has a pleasingly busy rear panel, including two MIDI inputs, a MIDI Thru and four MIDI outputs. Four control pedal inputs are provided: the Hold and Volume pedal inputs are standard fare, but two assignable inputs are also present, one of which will function with either a switching or continuous control pedal, whilst the other is for switching pedals only. Power arrives via a standard Euro connector with attendant chunky power switch. A pair of left(mono)/right audio outputs and a headphone socket give further evidence that the addition of a Voice Expansion Board will enable this master keyboard to produce more than a dull thunk, if required.

THE KIT INSIDE

The A70's operating system is very sophisticated. Its memory structure is a little confusing at first, but quite flexible once the basics have been grasped.

- System Memory is where the overall operating environment is defined, and does not require saving between power-ons. In here are delights such as the basic control channel and device ID, program Name Map assignments (more of which later) and LCD contrast controls.
- Internal Memory contains 64 'Performance' memories (I'll explain what these are shortly) and 10 'Chain' memories.
- Manual Memory is an area which behaves much like an extra Performance memory, to be utilised as a scratchpad — changes made here are automatically stored between power-ons. The Manual Performance can be stored to a Performance memory when required.

A PLACE OF ITS ZONE

Each Performance holds the combination of parameters required to access both external and internal sound sources. A Performance consists of up to eight 'Zones', four of which are designated 'internal' and four 'external'. There's actually no reason why an 'internal' Zone should not be used to access external sound sources, but with a Voice Expansion Board installed the designations are undoubtedly more meaningful.

Each external Zone is logically 'connected' to one or more of the A70's four MIDI output sockets, while the internal Zones can also be connected to the internal expansion board. All the A70's physical controllers, such as keyboard, pitch-bend lever, and connected pedals, are processed by the Zones before being transmitted from the MIDI outputs and on to the MIDI sound sources.

The 16 most important MIDI performance parameters are presented on the front panel of the A70 as a matrix of Parameter Select buttons. Pressing one of these buttons allows parameters to be edited in either a real-time context or for subsequent saving back to a Performance memory. Four values are shown on the LCD when a parameter is selected, and these correspond to the four internal or external Zones (toggling between the internal and external Zones is accomplished with a dedicated button to the left of the Parameter Select buttons). Editing is carried out either by moving the cursor to the desired field and using the data slider, increment/decrement buttons, and numeric keypad, or by moving one of the four Palette sliders, which correspond to each of the Zone value fields. Most of the parameters are pretty self-explanatory, and shouldn't cause much trouble for the seasoned user. Some parameters vary for internal sound sources (control of fine-tune, attack, decay, release, brightness (filter), effects and EQ settings is offered for internal sound sources), but they are edited in essentially the same way. Let me take you through the parameters on offer:

- **MIDI Channel** is obvious enough and gets us off to a gentle start.
- **Transpose** follows, and has a range of +/- 36 semitones.
- **Key Range** for each Zone can be set with the normal data-input methods or by using the keyboard — and actually it would have been nice to have the option of using the same method for other data input.
- A **Velocity Curve** for each Zone is separately definable, as is velocity sensitivity and a maximum transmitted velocity value.
- **Volume** can be set for each Zone, with the ▶

PLUG & PLAY

There are currently three Voice Expansion Boards available for plugging into the A70: the VE-RD1 (£399), VE-JV1 (£199) and VE-GS1 (£299). The VE-GS1 is a GM/GS compatible board based on the Roland Sound Canvas series, the VE-JV1 is an 8-part multitimbral, 28-voice polyphonic JV80 synth board, and the VE-RD1 is a 4-part, 64-voice board biased toward quality piano sounds, yet featuring a wide range of 'bread and butter' synth voices to boot. The A70 sent for this review came with the VE-RD1, which was fitted by the reviewer.

Fitting was simplicity itself, involving the removal of a couple of screws from the underside of the A70. I then just slotted the board in. Once I'd initialised the A70, I was presented with 64 factory Performances to show what the board was capable of. The pianos, with a wide range of acoustic, electric and electronic examples, are very impressive, with none of those obvious timbral changes across the keyboard that often mar piano multisamples. I still find the velocity-switching technique used by manufacturers to emulate the hard and soft electric pianos to be frustratingly clumsy, but the results here are better than most. The hammer 'thunk' on certain of the piano samples is a little too pronounced for my taste, but that's not to say that it's going to cause any major problems in normal use.

As well as the pianos, there's a decent 'bread and butter' selection of organ and synth sounds. The organs are pretty good, the growly B3 being particularly impressive, but some of the synth pads are a little 'safe' by modern standards. However, this is very much in keeping with the nature of the board — it presents a solid range of sound tools that will fit into a wide range of applications. If you're after something a bit more off the wall, don't forget that the sounds are editable — though not to the degree that you'd expect in a full-blown programmable synth — and modifying filter settings, attack and release times often sees a 'safe' patch well into the realms of the avant-garde. I was very impressed by the quality of the filter, which has a general 'creaminess' to it. However, I did note that editing while playing produces some delays and glitches in the sound, which may preclude its use as a technique in performance.

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Roland A70

FEATURES

- Keyboard: 76-key, weighted, synthesizer action, with velocity and channel aftertouch.
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- 64 programmable Performances.
- 10 Performance Chains.
- 4 User Name Maps.
- 9 Preset Name Maps.
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- Connections: MIDI (In x 2, Thru, Out x 4), Foot Controller, Foot Switch, Total Volume pedal, Hold pedal, Output (L(Mono),R), Phones.
- Weight: 16kg.
- Dimensions: 1245 (W) x 357 (D) x 136 (H) mm.
- Optional Voice Expansion Board (VE series).

More in-depth editing power is to be found in Edit mode. Here the functions of any of the physical controllers may be specified, including those controllers assigned to the Mono and Portamento buttons. Edit mode is also where the global transpose function is set up: you enter a value between +/-36 semitones and this applies as a global setting, switchable from the Transpose button. This seems a very inflexible and needlessly fussy process to go through for what is essentially a very simple requirement. How much easier it would be to hold down the Transpose button and then press a key on the keyboard, like Roland machines of old.

No list of Zone and Performance facilities would be complete without a mention of the 'Effector Control' memories. Each Performance has four such memories, separate from the internal and external Zones, and their data can be set to appear at any or all of the A70's MIDI outputs. In their simplest form, these memories would be used to transmit a program change for an effects device.

▶ added advantage that the relative volume levels for the Zones are preserved when using the A70's 'Total Volume' slider.

- **Pan, Reverb Send, Chorus Send, Portamento Time:** these do pretty much what might be expected — providing, of course, that the receiving sound source can make use of these messages.
- **Modulate, Aftertouch, Expression:** these parameter buttons permit these controller messages to be transmitted to individual Zones, rather than globally, as would normally be the case.
- **Program Change, Bank Select:** these can access all of your sound sources' available patches, and Roland have made life even easier by giving the A70 a number of Patch Name Maps, so you can select sounds by name, rather than by bank and program number. No less than 13 preset maps are provided, covering a range of Roland's recently released synths. Four maps are user-definable, but I'd like to see the number of user-definable maps increased, by allowing the preset maps to be overwritten.
- **Aux 1, Aux 2:** these parameters can be used to transmit just about any MIDI control message, including RPN [*Registered Parameter Number*], NRPN [*Non-Registered Parameter Number*] and System Exclusive messages. This is extremely useful, but it's a shame that the Aux 1/2 usage and their SysEx messages can only be defined at a global level, rather than on a per-Performance basis. When used as controllers, Aux 1/2's minimum and maximum controller values can be specified.

IN NEED OF HELP

Shortcuts are implemented in the Edit and Utility modes. Double-pressing either of these mode buttons allows you to enter a two-digit code, corresponding to a specific menu item: you'll then be taken straight there. For the more cautious there remains the longer route, navigating through the menu system, with the assistance of the Help button if required. The Help facility is available at all times, and though it's very welcome, its usability is compromised by the size of the A70's screen — the information presented by the Help facility is often as cryptic as what it's attempting to clarify!

The Panic button is there to be used when the A70's Voice Expansion Board or an external MIDI instrument suffers from a hanging note. A single press sends MIDI Note Off and Hold Off messages for currently held keys, and also re-transmits the A70's current settings. Double-pressing the Panic button also sends Note Off messages for all MIDI note numbers and Controller Reset information on all channels. Now there's a feature which could save a few blushes!

On the far right of the A70's front panel is a set of sequencer controls: Play/Stop, Reset (to song start), Tempo and Song Select (up and down). Like the Zones, these buttons can be assigned to any of the four MIDI outputs. The A70 transmits standard MIDI clock signals, the tempo of which can be ▶

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"A healthy screen size, with graphic representations of routings and data values, would make the A70 a much friendlier machine..."

specified as a preset within the Performance, or changed temporarily as the song plays. (It is important to understand that the A70 will not pass on clock information received at either of its MIDI Input sockets to the MIDI Out sockets — it will only generate its own clock signals.) The song select number can also be pre-set to be transmitted when a Performance is recalled.

REMOTELY CONNECTED

As I mentioned earlier, a pair of MIDI inputs graces the rear of the A70, and these connections require a little explanation. MIDI input 1 is designated the 'Remote' input. For those of us still loath to produce all of our music from a single keyboard, this is an ingenious way of making the A70 sprout another (or a set of MIDI bass pedals, for that matter). Data received at the Remote input is sent to any combination of Zones specified by the user and then onto the MIDI outputs as if it had been generated by the A70's own keyboard. With a system such as this, it's obviously important to specify which Zones are accessible by the remote keyboard and which by the A70's own keyboard, and Roland allow full flexibility to separate or merge to each Zone at will — brilliant!

MIDI input 2 is specifically designed to take multi-channel information from a sequencer. The data received at this input is not sent via any of the A70's Zones, but is passed straight to the MIDI output(s) or the internal Voice Expansion Board. This allows a full multi-channel sequence to be sent to your MIDI rig and merged with the data generated live by the A70 (and any connected remote keyboard). The MIDI outputs which re-transmit the data received from MIDI input 2 are assignable, on a per-Performance basis. Bulk dumps are also received from MIDI input 2, which seems sensible given its designated use with a bulk storage device or sequencer.

Once you've designed a number of Performances you'll probably want to use them in a specific order, perhaps to follow the order of songs in a live set. Re-ordering Performances every time the set changes would be a drag, so Roland have given the A70 10 'Chains', of up to 64 Performances each. Creating a Chain is relatively easy: select a step number and then assign a Performance number to that step. Steps may be inserted, deleted or edited. During editing, and on playback, the Chain display screen shows the current step number and the total number of steps assigned, and also details the previous, current and next Performance numbers in the chain — very friendly, I'd say. Chains can be set to loop back when they reach the end, if required.

HONING WITHOUT DRONING

With all this MIDI data flying around, things can get confusing for the best of us. The A70's four MIDI output buttons are there to help restore order. These controls simply toggle the A70's four MIDI output sockets on or off. Whilst these are obviously useful when honing your Performances, they would also be handy for switching sounds in and out in a live situation. Any sustaining notes caught in the middle of switching are held until the notes or hold pedal are released normally. It is also possible to tag Zones with comments, which will be displayed on the LCD when the Zone button is held down for a couple of seconds. You have a healthy two lines, with 17 characters to each line, for entering comments, and this is certainly a thoughtful addition for those of us who invariably have a mental block at the most inopportune moments.

Two display modes are available to make the best of the A70's diminutive screens. Data may be displayed as numerical values or bar graphs, and note values as MIDI note numbers or note names. It would be nice if each screen was able to remember its own preferred setting, but it is quite easy to toggle between the two modes at any time.

The Utility button hides housekeeping functions, such as saving or copying Performances, initialising Performances or system settings, and making System Exclusive dumps to an external storage device. System Exclusive dumps are divided into a number of data types which may be individually selected for inclusion in the current dump.

CONCLUSION

Generally speaking, I found the A70 a pleasure to use. The power and flexibility of the control features is exemplary, and the sheer range of parameters and easy real-time control are superb, leading to many of those "Hey! I could..." moments. I find the option to add Voice Boards enlightened, and the facility for adding a second 'remote' keyboard is little short of perfection. The A70's sequencer controls, and the way it handles sequencer MIDI throughput, would certainly prove a great asset to the live performer — the software certainly seems bullet-proof. However, its potential for live use (for which its feature set qualifies it admirably) is marred by a build quality that falls short of what I would have expected of Roland. In a studio context, this is obviously of less concern. The small screen must also be seen as something of a handicap. When so many manufacturers are leaning towards larger screens I would find it hard to justify one of this size.

Despite these gripes, the A70 can certainly deliver the goods as a powerful master keyboard, and could well solve problems that you may never have realised you had. Give one a thorough examination in your local store and I doubt that you'll disagree. SOS

THE SMALL SCREEN?

The size of the A70's screen causes me some concern. On a device with as much flexibility as this, it seems a shame to attempt to cram so much into so small an area. A healthy screen size, with graphic representations of routings and data values, would make the A70 a much friendlier machine, and would probably encourage a greater degree of programming. The lights may well now be on in the hall, but we're still wallpapering it through the letterbox.

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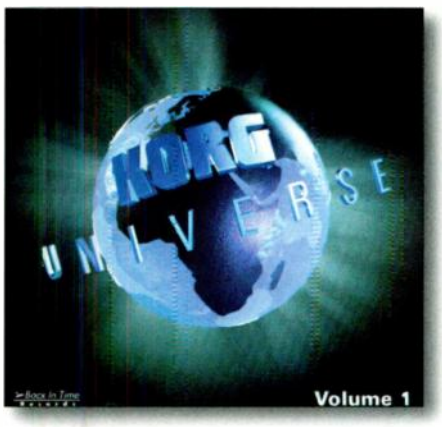

KORG UNIVERSE VOLS 1&2

(KORG Z1-COMPATIBLE & AKAI FORMAT CD-ROM)

Produced in Germany by an outfit called Back In Time Records, and licensed via Korg's German distributor Musik Meyer to Korg outlets worldwide, the *Korg Universe* sample sets are unlike most sample CD-ROMs, in that each volume also comes with a floppy disk full of program and effect templates for the Korg Z1. The CD-ROM samples have been designed to provide sound expansion capability for the Z1, but they are also compatible with Akai S1000-series samplers, which gives them a much wider market appeal. For the review, I loaded them into my Akai S2000 with no problem.

The CD-ROM sounds are based on a number of Korg synthesizers, many of them analogue, dating right back to the Mini 700S monosynth (the first synth I ever bought). This particular keyboard had a rather nice filter and a very useful ring modulator, and a number of striking ring modulator sounds are captured here. The collection then takes us on a roller-coaster ride past the 800DV, the PS3100 and the Trident MkII polysynth, before plunging onward to the DW8000, DS8 digital synth and — my personal favourite — the Wavestation AD. There are some great textural pads in this section, but I would have liked many more! There are also some rich T1 AI sounds, after which comes a procession of organs, digital pianos and orchestral modules. To wrap up disc one, there are some striking (it wasn't meant to be a pun, honest!) Wavedrum sounds, plus some truly disgusting samples from the Minipops analogue drum machine that sound like somebody popping bubble pack while rhythmically blowing their nose on aluminium cooking foil. Other drum sounds come courtesy of the MR16, the DDD1 and the DS8.

You might expect Volume 2 to follow chronologically, but it starts off with the 770S monosynth from 1976, then treats us to a parade of progressively less antique machines, including the M500SP, MS20, KP30 Sigma, Mono/Poly, PE2000, ES50 Lambda, PS3200, Delta String Synth, PolySix, EX8000, M1 EX, M3R, 01/W and even the Z3 guitar synth. To cap it all, there are more drums from the KR55, the KPR77, PSS50 and the S3 Rhythm Workstation, not to mention yet more taken from the drum voice sections of various digital synths.

As you might imagine, some of the analogue sounds are fairly memory-efficient, with many small enough to fit on a floppy disk. Even the digital samples tend to be just a few Mb in size, so if you don't have a full memory expansion, in your sampler, this collection might be particularly useful to you. I have to admit to finding some of the analogue sounds a bit samey, and unless you add effects they sound as dry as dust, but they are very nicely recorded and looped, and there are plenty of examples to choose from. Even the digital synths are sampled extremely well, to provide warm, evolving textures.

The producers of this disc certainly give you plenty to play with, because not only do you get a lot of different Korg instruments to choose from, there may be 30 or more different samples of each instrument. Where the instruments are stereo, you occasionally get a choice of both mono and stereo samples, and I particularly liked some of the Wavedrum examples. If you're a Korg fan, you'll find these two volumes irresistible. *Paul White*

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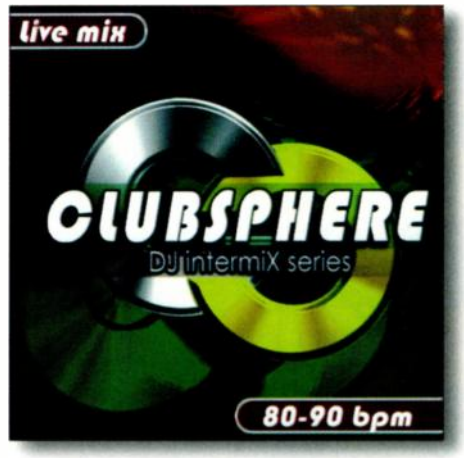

CLUBSPHERE DJ INTERMIX SERIES: 80-90BPM

(DOUBLE AUDIO CD)

Interestingly, though this *is* a sample CD, it is not aimed primarily at the samplist but at DJs. Each track comprises a looped pattern three minutes in length — long enough for a DJ to mix in live as a link between tracks or to layer in a chill-out room. This is one of several discs in the Clubsphere range, each one dealing with loops at different bpms — this one contains solely patterns at speeds ranging from 80-90bpm, as its name implies.

Seldom am I lost for words, but there's something distinctly unfamiliar about the first pattern on this double CD. It's not quite techno or electro, not hip-hop, nor four-on-the-floor either. I must sample it, varispeed it and generally work out what is going on and how I can use it!

A wide range of sounds and feels are employed over the 40 tracks on this double CD. Not all the tracks are quite as inspiring as the first, but many are, and those that are not are still eminently usable; the engineering is good, and the effect in stereo is particularly pleasing. Some tracks are presented as two separate mono mixes hard-panned left and right. It's not always clear what instruments have been used, but in the midst of digitally treated sampled music hits, and hard-but-warm drum sounds, I distinctly heard African, Indian, Latin and Carribean percussion. These sometimes disparate sounds are skilfully blended, so that the overall effect is never one of overcrowding the mix. You might, for instance, hear one ▶

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percussion track being filter-swept in the background, subtly adding movement to rather than overpowering a pattern.

Conclusion: My favourite loops on *Clubsphere* are those with an electronic rather than a natural bias — despite the digital sources, these loops have a warm, analogue-style to them. With each track running at three minutes, you don't even need a sampler — just play the tracks and get a singer to busk over the top. Hey presto — you've got a new tune. If you are looking for something slow but different (and can afford to shell out 20 quid for what amounts to only 60 or so 1- or 2-bar loops, my only cause for concern with this product), I can heartily recommend *Clubsphere* to you. *Wilf Smarties*

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OLD SCHOOL FLAVOURS VOLS 1, 3, & 4

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RARE GROOVIN' ●
SUPERFUNK ●
HOUSE PARTY ●●●

This is a series of four Zero-G discs, one of which (Vol. 2) has already been reviewed by my colleague Paul Farrer in the Jan '98 issue of *SOS*. I'll deal with the remaining three at once here, since they share many elements and qualities.

MJ Dunne of RonJon productions has been responsible for previous Zero-G output, notably the well-received *Funky Elements* micro series. What's he up to this time? Well, *Old School Flavours* is a somewhat longer series of sample CD releases aiming to supply *aficionados* of certain well-worn musical styles with some fresh drum loops (all the original ones having been exploited out of existence). The format for all three releases reviewed here is the same. There are nine Sets on each CD, each of which comprises 10 tracks, in turn sub-divided into two groups of five loops. Each Set uses the same kick, snare and hi-hat voices. On the odd occasions when toms appear, they play very much a supporting role. At the end of each CD, you are given the single hits that the loops have been sequenced from.

The Sets are not tempo-consistent, and bpms are given on a per-track basis. Each track holds three related 4-bar patterns, called Main Groove (Verse), Simpler Version (Chorus) and Offbeat Syncopated Version. All the patterns used in a Set sound as if they are first or second derivatives of a single programming idea, albeit presented at different tempos and with different levels of programming complexity.

There's nothing wrong with MJ Dunne's sequencing — drum patterns follow the sort of moves a real drummer with two arms and two legs would and could make. What bothered me was the fact that often only one snare voice is used, with level the only parameter being varied. To be honest, a much more realistic simulation of live performance would have been achieved by judicious use of velocity switching (between different samples taken at varying hit strengths). On sets where more than one snare sample *is* used, the improvement in feel is dramatic (eg. the Kool Grooves set on the *Superfunk* CD).

There isn't a lot to separate the styles of the *Superfunk* and *Rare Groovin'* (slightly swingier) releases. Sound-wise, the former used cleaner voices, but the overall effect for both was the same — sequenced samples, and 'inorganic' drumming (I hate hearing samples stop early). The best CD for me was the *House Party* collection, which included some lively stomps in a fairly retro vein. I guess this is a simpler style to sequence. Also, it skirts an important area where not much is available in the sample CD market right now — '70's dance music, *the* sound of 1998.

Conclusion: MJ Dunne has sampled — and probably painstakingly sculpted the envelopes of — drum hits chopped out of live drum patterns, and re-sequenced these with natural performance programming to create fresh loops from old sounds. Unfortunately, that in itself is not enough to convey the lovely warm feel that vintage drumming gives — for that, you need some credible way of expressing dynamics. As ever, the devil is in the detail, and I'm afraid not nearly enough effort has gone into making the *Old School Flavours* series convincing.
Wilf Smarties

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WHERE TO USE PROCESSORS AND WHY

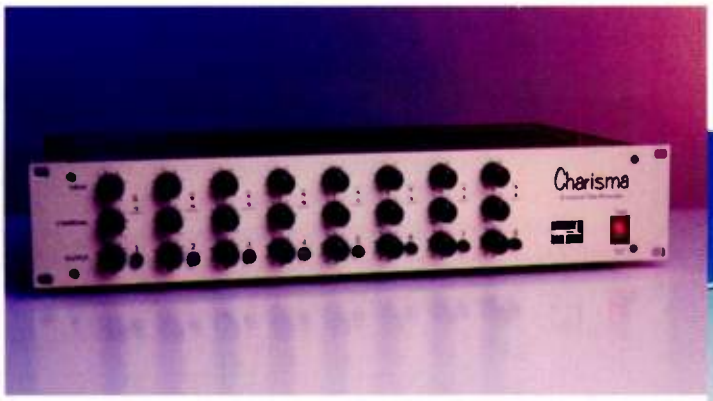
With so much high-end analogue processing gear using valves these days, it's easy to assume that they invariably equate to a better sound — but that's not always the case. PAUL WHITE explains.

Though valve equipment has been favoured for years for guitar processing, there's recently been an upturn in its popularity for studio use. But why? There's no disputing that well-designed valve equipment has a certain sonic 'something', but there's still no clear agreement over exactly what that something is. Some people would have us believe that valves distort in a subtle but interesting way that makes the sound 'warmer' or more detailed, while others suggest that the point is not that valves are magical, but rather that solid state devices actually damage the sound in some way that isn't shown up by simple measurements. It doesn't really matter which, if either, of these hypotheses is true — what's important is identifying where valve equipment can make your sound better, and where it might make it worse.

As I pointed out in a recent Leader column, high-quality vintage valve gear wasn't designed to deliberately distort — the designers did their best to make the valves in their circuits behave as linearly as possible, so any remaining distortion should be quite low in level. Even so, we know that when valves are driven hard with peak signals they do tend to behave in a non-linear fashion, and this behaviour is a lot kinder to the signal than the hard clipping associated with solid state circuits. However, a lot of older valve equipment also includes audio transformers, and these too can saturate in a non-linear way if pushed hard, so it's not always easy to say exactly which part of the circuit is responsible for which aspect of the sound.

The increased distortion on high-level transients exhibited by valve equipment does correspond, at least in part, to what we hear when using a harmonic enhancer or exciter. Adding small amounts of controlled high-frequency distortion creates artificial harmonics that are musically related to the high end of the existing signal, and that has the effect of making the signal seem more detailed or transparent. This is quite counter-intuitive, as you'd expect distortion to make things sound less clear.

Valve distortion also seems to produce this 'clarifying' effect, but only when the amount of distortion is relatively low and confined to transient sounds. If the drive level is increased so that even average level signals are distorted, pure musical sounds (such as flutes, or synth sounds with few harmonics) produce audible intermodulation distortion products, based on the sum and difference of the frequencies present. For example, if you were ▶



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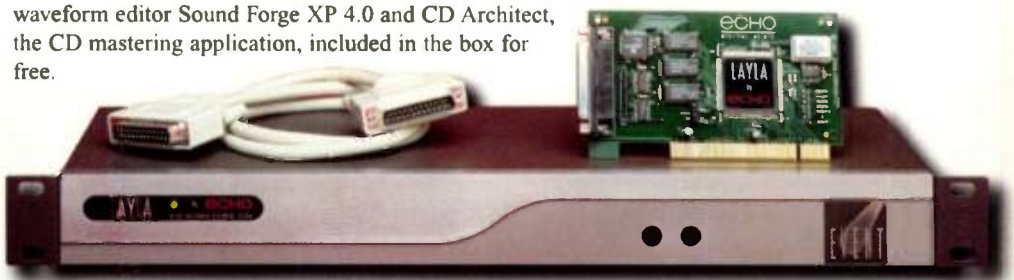

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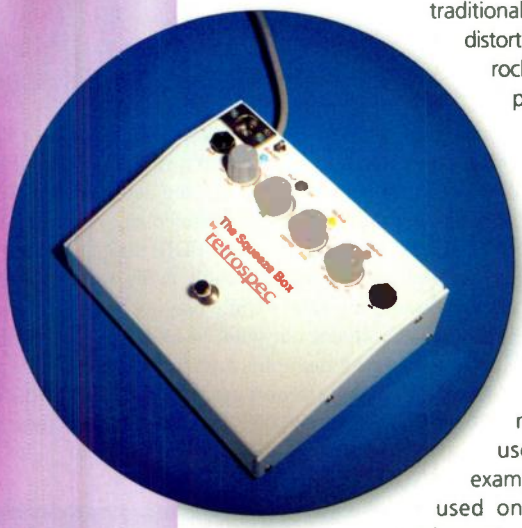
to play two sine-wave pitches of 200Hz and 250Hz at the same time, the intermodulation products would be at 450Hz (sum), and 50Hz (difference). If you carry this over to musical intervals, you'll invariably find that the intermodulation products are unrelated to the musical pitches you're using, so the result sounds dissonant and unpleasant. The only exceptions are those musical instruments that we traditionally associate with very high levels of distortion, such as the electric guitar and the rock organ, where the intermodulation products have become an accepted part of the sound. Even then, a speaker that rolls off at high frequencies is required to prevent the result from sounding harsh and unmusical.



Retrospec Squeeze Box.

HOW MUCH DISTORTION?

Unfortunately, a number of modern tube products generate rather too much intentional distortion to be useful on all types of material. For example, a highly coloured mic preamp used on a pure voice can sound quite unpleasant, whereas a harmonically rich voice processed through the same device might sound fine. My own preference is for relatively clean-sounding valve gear, but if you like the option of adding more obvious distortion when the material warrants it, a device with variable valve coloration will obviously offer the most flexibility. Drum sounds, for example, often benefit from relatively high levels of distortion, as their transient nature makes it difficult for the human ear to detect any obvious distortion. Instead the sound simply becomes punchier, more 'attacking', or crisper.

Because different audio material responds differently to valve coloration, this begs the question of how a complete mix should be processed, because, quite obviously, a typical mix contains many different sonic elements. I have to admit that some valve processors do make a complete mix sound sweeter and better integrated, but once again, the units with the clearest audio path seem to do the job best. If you need to be more heavy-handed with drum and bass sounds, routing these sounds via a stereo subgroup, with a less subtle valve processor plugged into the insert points, is more likely to produce a satisfactory end result.

At this point you might wonder why harmonic enhancers and exciters can work well on a complete mix, even when the level of effect is quite noticeable, but the key to their success in this application lies in the fact that they confine their processing only to the higher reaches of the audio spectrum. Valve distortion, on the other hand, will affect *everything*. For this reason, you have to be quite careful about where and how you apply valve distortion.

NOISE

Valves are inherently noisier than solid state devices, not least because they run at high temperatures, and electronically generated noise is proportional to temperature. If valve equipment is designed properly, its thermal noise level can be kept low enough for serious studio work, providing not too much gain is required. In equipment where a lot of gain is required, such as microphone preamps, it's normal to use an audio transformer before the valve, to increase the signal voltage. As valves are inherently high-impedance devices, they team up particularly well with step-up input transformers. Unfortunately, really good audio transformers are expensive, so you'll find that most of today's less expensive valve mic preamps use a solid state input stage instead of a transformer. This hybrid approach can work well, but purists will tell you that they don't sound the same as an all-valve circuit with a transformer at the front end.

Valve microphones use a valve preamp inside the mic body, and, for whatever reason, the best vintage models sound very nice indeed. Their noise performance tends to be a little worse than an equivalent solid state design, but when you're miking instruments or voices at fairly close range, this isn't really a serious issue. Some companies, such as Sony, have built valve microphones with elaborate cooling

> "Some people suggest that the point is not that valves are magical, but rather that solid state devices actually damage the sound in some way that isn't shown up by simple measurements."

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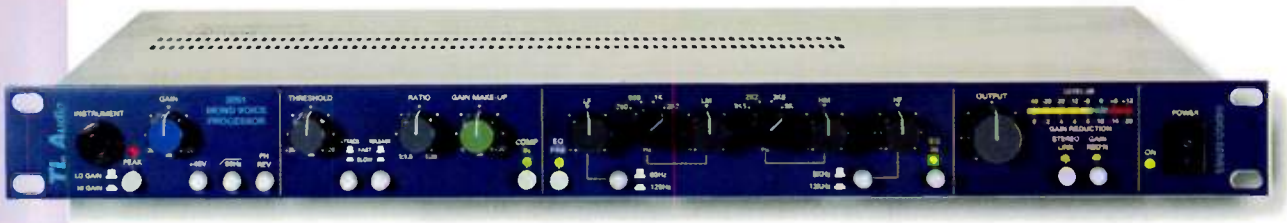

TL Audio Indigo VP2051.

systems to try to improve noise figures, but in most routine music applications this isn't necessary.

If you choose to use a solid state mic and then process this via a valve preamp, it's possible to gain some of the tonal benefits of a valve mic, but unless the preamp has a transformer input stage it could be argued that you'll do just as well using your regular console mic input, with a line-level tube preamp in the channel insert point. I've done this using a Ridge Farm Gas Cooker preamp (which has variable valve drive), and it seems to work very well. However, no two audio chains will ever give you exactly the same result, so being too perfectionist in your pursuit of a specific sound you once heard on a vintage recording often leads to disappointment.

While valves can be made to run reasonably quietly if proper attention is paid to circuit design, there are other sources of noise specific to the valve. One is so-called 'microphony', where the internal metalwork of the valve vibrates in response to an external sound and ends up modulating the signal being amplified. Guitar players are familiar with this, as their valves often share the same cabinet as their loudspeakers, but pro-audio equipment can suffer from it too, especially if the monitoring level is high. The usual cure is to select non-microphonic valves when choosing replacements, but you can generally tell if you have problems by tapping the valves with your fingers and listening for corresponding noises through the speakers.

> "Unfortunately, a number of modern tube products generate rather too much intentional distortion to be useful on all types of material."

Another common source of noise is oxidisation on the valve pins, caused by the heat of the valve. This usually results in intermittent, 'spluttery' or 'fizzy' noise, caused by varying contact resistance. In these cases, cleaning the pins and valve socket using a proprietary electronic cleaner, such as Deoxit, is a good idea. In older equipment, heat from valves can cause accelerated ageing in nearby capacitors and resistors, again resulting in noise (or even complete failure), but unless you have a good grounding in electronics, tracking down and replacing these is a job best left to the professionals. For these reasons, owning and maintaining vintage valve gear can be expensive.

SUMMARY

Good valve circuitry can have a positive effect on sound, but you can't assume that a unit will sound good simply because it has a valve or two inside. I'm a fan of good valve microphones, as they do seem to present a better integrated sound than most solid state models, but if you haven't had a lot of experience with tube products, you might find the differences are smaller than you expected. Indeed, valve processors that make the biggest tonal differences are also likely to have the most detrimental side-effects, unless there's a proper facility for adjusting the amount of valve drive.

Processing a full mix via a quality valve equaliser or valve compressor can bring about a subjective improvement in sound quality, especially if the source is all-digital and a little sterile-sounding, but beware of anything that seems to change the sound excessively when any EQ or compression element is switched out. Try to listen to the music without concentrating on it too much, and see if the effect is smooth and involving or harsh and dissonant. A mix with a brash edge may seem impressive when you first hear it, but if it has the effect of making you want to keep turning the level down it's probably not the right effect to use. A good processor will leave the music sounding transparent and cohesive, without making it aggressive. Similarly, the much-vaunted warmth of valve processors should manifest itself as a more solid bottom end, not as an obvious bass boost or bass muddiness. You'll also find that some solid state devices have a sound that is more 'valve-like' than some genuine valve processors, so don't be fooled by the glow inside the box. Let your ears decide for you, and always use whatever does the job best. SOS

Digitech RPM1.

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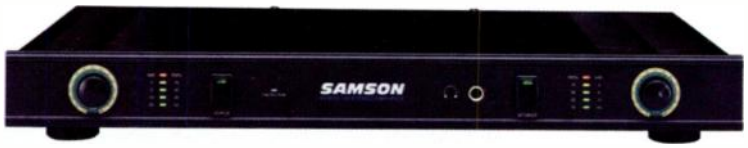

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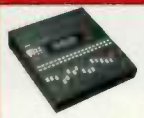

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American Excess?

INWARD CONNECTIONS VAC RAC MODULAR PROCESSING SYSTEM

The Vac Rac modular valve processor is built like a tank and has the colour-scheme of a battleship — but what can it do for your sound? HUGH ROBJOHNS investigates the marriage of over-the-top engineering and traditional tube technology.

Three Vac Racs, showing possible combinations of modules.

The Vac Rac is produced by an American company called Inward Connections, based in California and established in 1987 by Steve Firlotte. His experience with PA companies in the '70s and a major console manufacturer in the '80s left him in the perfect position to form a company which specialises in producing audio equipment with first-class sonics, total reliability, and a 'no-compromise' construction technique. The Vac Rac also benefits from the design efforts of two others — Steve Barker (BBAT Productions) and John Hall, and the design team as a whole boasts over a century of experience! Their philosophy is quoted in the manual as *"Function dictates form and never the opposite"*.

HARDWARE

The Vac Rac is a very distinctive valve-based modular signal processor. Four modules can be accommodated in the rack: a mic preamp, a 3-band equaliser, an instrument interface (DI box), and a limiter, and the purchaser can specify the combination. The Vac Rac reviewed here consists of a mic preamp, an equaliser, and a pair of limiters. That much technology can easily be accommodated in a 2U rackmount box, so it came as a bit of a shock to discover that the Vac Rac is the size of a microwave oven and about three times heavier!

The Vac Rac's power unit itself is surprisingly heavy for a box measuring just 8.5 x 8.25 x 1.75 inches (half-rack width and 1U high). This module features an IEC mains lead input, a multi-pole output lead, and a fuse holder and illuminated power switch on the front panel. The enormous torroidal transformer has been generously over-rated, and the unit emits no detectable audio buzzing, nor strong magnetic fields. It's supplied as a 240V unit; changing the mains supply voltage rating involves internal rewiring of the transformer primary taps. The manual provides instructions in case the user ever needs to do this.

The 18-pin circular connector which carries the necessary supply voltages to the Vac Rac main frame is made of plastic and looks like a military-spec design. However, it actually feels rather more flimsy than it looks, which does not inspire confidence in its longevity. This cable carries a range of AC voltages directly from the transformer in the power unit to the Vac Rac proper, the highest being the 325V anode voltage, followed by 48V (phantom), 15V, two 6.3V heater tappings, and two 24V supplies.

The main 19-inch rackmounting Vac Rac chassis is nothing short of enormous, measuring 19 x 12.25 x 5.25 inches (4U high), and it's supplied with a ▶

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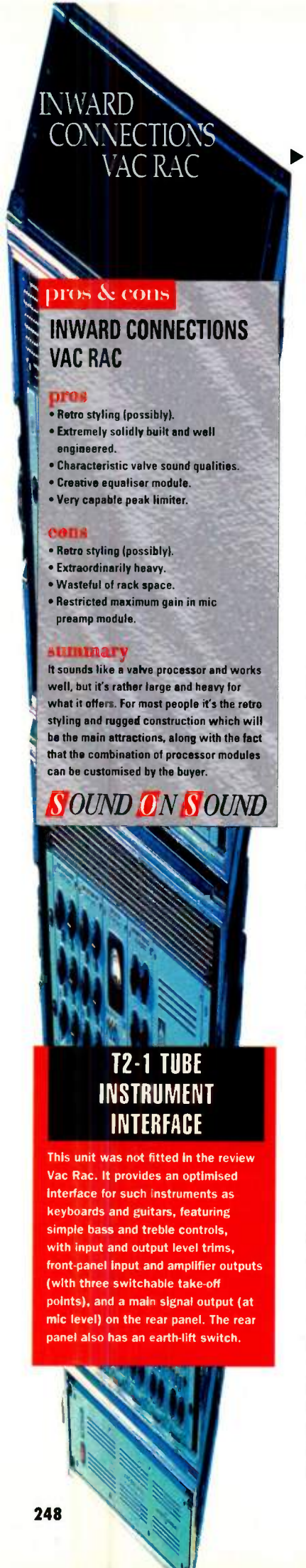

pros & cons

INWARD CONNECTIONS VAC RAC

pros

- Retro styling (possibly).
- Extremely solidly built and well engineered.
- Characteristic valve sound qualities.
- Creative equaliser module.
- Very capable peak limiter.

cons

- Retro styling (possibly).
- Extraordinarily heavy.
- Wasteful of rack space.
- Restricted maximum gain in mic preamp module.

summary

It sounds like a valve processor and works well, but it's rather large and heavy for what it offers. For most people it's the retro styling and rugged construction which will be the main attractions, along with the fact that the combination of processor modules can be customised by the buyer.

SOUND ON SOUND

T2-1 TUBE INSTRUMENT INTERFACE

This unit was not fitted in the review Vac Rac. It provides an optimised interface for such instruments as keyboards and guitars, featuring simple bass and treble controls, with input and output level trims, front-panel input and amplifier outputs (with three switchable take-off points), and a main signal output (at mic level) on the rear panel. The rear panel also has an earth-lift switch.

1U ventilation panel which must be mounted above the chassis when it's installed in a rack (the main rack does generate a reasonable amount of heat in use). Despite its size, the chassis can accommodate only four signal processing modules, a large section to the right of the chassis being given over to the high-voltage power supply section (complete with small ventilation fan on the rear panel).

Both the Vac Rac and the separate transformer block are painted battleship grey, and the module front panels feature 'period' window VU meters and octagonal knobs, which give the unit the exact appearance of something salvaged from a 1950s American radio station!

TMP1 MIC PREAMP

Each signal processing module is wholly independent of the others, and only shares power supply feeds from the main chassis. All operational controls are on the front panel, and almost all connections are at the rear.

The review Vac Rac system was supplied with a TMP1 Tube Microphone Preamplifier as its first unit. There are two versions of this unit: one with a simple output, and the other with insert points and provision for an external fader. I had the latter variety, whose rear panel features XLR connectors for the microphone input and line output, plus three quarter-inch jack sockets for an insert send and return, and a remote fader. The mic input is transformer balanced, as is the main output (optionally), but the line-level insert points are unbalanced, as is the signal on the fader jack (basically just another insert point wired as send and return on a single jack!). A solid-state buffer amplifier follows the fader jack (which can be internally adjusted to give 0, 10, or 20dB of gain, allowing the fader to be operated in an appropriate position) and this drives the balanced output XLR. The idea behind the fader jack is that the unit could be used to record signals direct to tape, but with the added convenience of an external fader for fine level adjustments. Internally, amplification is taken care of by 6072A and 12BH7 valves, with coarse gain adjustments made via a stepped feedback network.

The specifications might look disappointing in comparison with some of the best solid state devices, but they are quite respectable for a valve processor. Maximum gain is restricted to just 53dB, equivalent input noise is quoted as -126dBm, and the overall signal/noise ratio is -85dB. Distortion and intermodulation figures are actually very good, as is the headroom, with +26dBm acceptable on the input and +30dBm available from the output.

The front panel is dominated by a large VU meter with suitable retro styling (an internal jumper allows calibration for either +4dBm or -10dBV, with reference to 0VU). Beneath this are four flat toggle switches, a quarter-inch jack input socket and two octagonal knobs, one switched and the other continuous. The switches provide phantom power, a 20dB pad, polarity reversal, and mic or line switching. There are no indicators for these functions, other than the position of the toggle bars, and the only sign that the unit is powered is the backlight in the VU meter. The front-panel jack socket is intended for high-impedance DI inputs, and works extremely well in that capacity.

The gain trim control is situated before the first valve and sets the input level to the amplifier chain, the gain of which is set by a stepped feedback network providing eight positions, with 2.5dB additional gain per step. With a microphone input the gain trim knob covers a 10dB range, completely swamping the effect of the coarse gain switch, and with a line input the trim covers the full signal range all the way down to silence. This makes setting up the unit a slightly unusual experience, and it's easy to overdrive the input stage if care is not taken. You have to find the best compromise between active gain and input drive, noting that too much of the first can add noise, and too much of the second can add distortion. Unfortunately the manual provides no advice on how to optimise the gain structure of the module.

Overall, the mic stage performs very well, and far better, in terms of noise, than the specifications might suggest, though it's important to set the gain structure properly. There's barely enough gain in the module to raise the level of a decent condenser mic to working line levels with the spoken voice, but with sung vocals close to a mic there's no problem at all. The line input is easily able to accommodate full line levels from a Pro Tools workstation, as well as the outputs from keyboards and guitar pickups. In fact, the sonic quality of the tube mic preamp is extremely effective with most guitars — although overdriving the input stage does not introduce a pleasing form of distortion.

The only other point to mention is that the switched rotary controls on the review unit were very stiff to turn. This may simply have been because the unit was new, and the switch springs may ease off with use, but I found it tiring to use, as the controls have to be gripped firmly to move them at all.

TEQ1 TUBE STEP EQUALISER

The TEQ1 module is a classic 3-band mono equaliser. The rear panel carries both XLR and quarter-inch inputs and outputs, with inputs being electronically balanced and outputs unbalanced (unless the optional output transformer is installed). The input stage uses a 6072A valve feeding into a solid state stage which drives the EQ circuitry. The gain compensation for the loss in the equaliser circuitry is also solid state.

The three bell-shaped EQ bands have identical facilities, with stepped cut/boost controls (providing gain or attenuation of 2, 4, 6, 9, or 12dB), and five stepped centre frequencies. The unit uses the same octagonal knobs as the mic preamp, but introduces green plastic push-buttons for the additional switch functions, as a space-saving measure over toggle switches.

The top EQ band covers the range between 5 and 15kHz, the middle provides 400Hz-5kHz,

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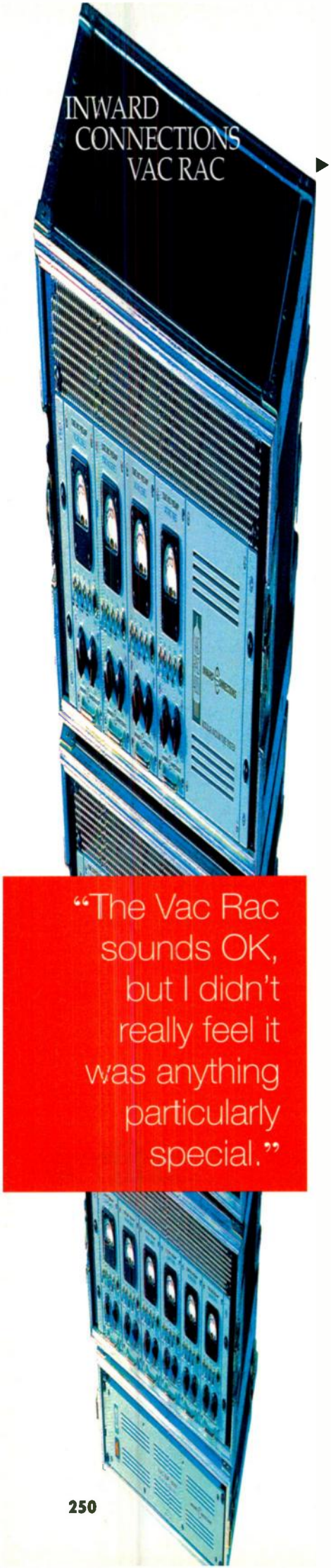

"The Vac Rac sounds OK, but I didn't really feel it was anything particularly special."

and the lowest band covers 50-400Hz. The upper and lower bands can also be switched into shelving filters via push-buttons, and a further pair of push-buttons introduces a 15kHz low-pass filter and a 50Hz high-pass filter.

The final operational control is another push-button which bypasses the equaliser (but not the high- or low-pass filters), and this has an associated LED to indicate when the EQ is in circuit. A second LED shows when the module is powered.

I found the equaliser module extremely useful in shaping the sonic character of musical instruments — it has clearly been optimised for this role. The scaling of the cut/boost controls and the chosen centre frequencies combine to make this a very usable tool. My only concern was with large amounts of HF boost, when hiss and noise become rather more apparent than I was expecting.

TLM1 TUBE LIMITER

The TLM1 is a basic peak limiter module styled to match the mic preamp, with identical VU meter, a row of three toggle switches, and a pair of octagonal knobs. The first of the toggles provides a bypass of the limiter circuitry (but not the input gain control), the second switches the VU meter between showing the output level and the gain reduction, and the third activates stereo linking with another module. The front panel also has two preset trimmers, one for adjusting the zero point when the VU meter is in gain reduction mode, and the other for setting the meter calibration in audio output mode.

The two main operational controls are marked Gain and Reduction. The former provides a 10dB gain range on the input to the first 6072A valve stage (the output drive is taken care of by a 12BH7 valve). The Reduction control determines the amount of input signal which is fed to a solid state amplifier and used to drive an optical attenuator, arranged to reduce the input-signal level to the unit.

The rear panel accommodates balanced inputs on both an XLR and a quarter-inch jack. Line-level outputs are also provided, with XLR and jack socket, but are unbalanced unless the optional output transformer is installed. A third jack socket, marked Link, is provided. This allows you to link two units for stereo operation, via an unbalanced jack-to-jack lead.

Setting up this unit is trivially easy. The Reduction control sets the desired level of peak limiting, and the Gain knob is then adjusted to restore the overall signal level, while you monitor the output level on the VU meter. The manual doesn't give any specifications for attack or release times, but in use the limiter works very well. It can apply huge amounts of gain reduction with negligible side-effects, and the dynamic response is such that 'pumping' is minimal, even when the unit is being severely overdriven with transient signals such as drum tracks.

This limiter can't really be used as a creative tool — its controls don't provide sufficient flexibility for that — but it is a solid and reliable protection limiter that can accommodate serious abuse with remarkable ease, and almost completely inaudibly.

OVERALL

The Vac Rac is an interesting unit, and one I enjoyed experimenting with, but I'm not sure who it will appeal to. The retro styling is certainly distinctive, but it doesn't appeal to me particularly (my first professional audio experiences in the BBC were with equipment that looked remarkably similar to the Vac Rac, and I don't hanker to return to those times, thank you very much!).

Despite the unit's sonic suitability for keyboard and guitar processing, its size and weight will not appeal to anyone who tours (well, not to their roadies, anyway). As a studio processor I guess it's more appropriate, although it occupies an awful lot of rack space for just four signal processing units, and there are plenty of better specified units occupying much less space — some of them still employing valve circuitry, too.

The Vac Rac sounds OK, but I didn't really feel it was anything particularly special. The equaliser does work well in creatively shaping the sounds of most musical instruments and voices, and the limiter is a very effective level controller, but I can't really commend the Vac Rac beyond that. The hybrid circuitry is quiet enough in most circumstances (aided by the provision of a very modest 53dB of maximum gain in the mic preamp), and certainly adds the expected and characteristic 'valve warmth', although none of the processors sound good when overdriven. It is extremely well built, and (apart from some slight reservations concerning the multi-pole power cable) I don't think it will ever break!

So what it comes down to is this: the Vac Rac is extremely solid and robust; it provides usable and competent signal processing in a modular form, allowing customisation; and it looks like something salvaged from a wartime battleship. It is also extremely heavy, provides a poor return on processing per 'U' of rack space and, beyond benefiting from the typical sonic signature of well designed valve circuitry, provides nothing that could be described as exceptional. If you like the look of the Vac Rac and space is not an issue, go for it, but if not I would suggest that you consider alternative valve-based signal processing units which will potentially give better flexibility in more efficient packages. SOS

info

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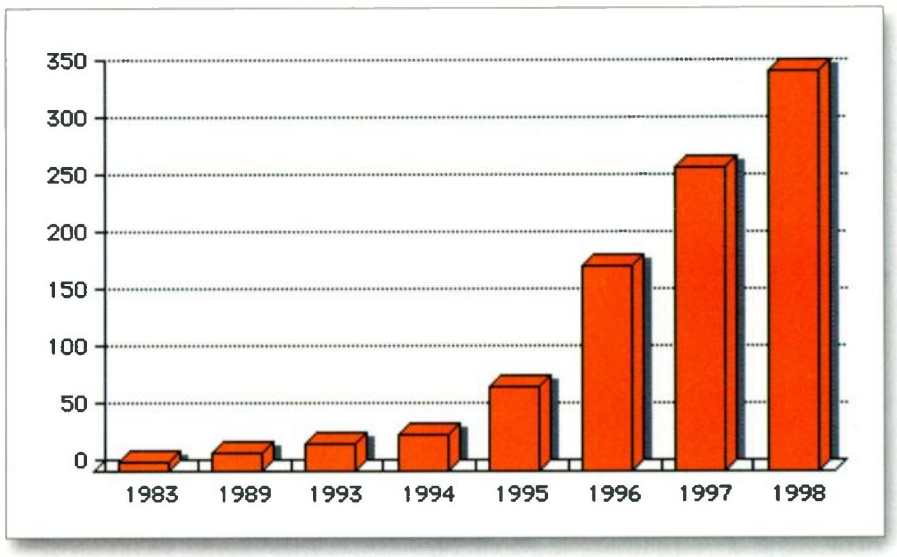


The rise of CPU clock speeds (scale in MHz).

When is an upgrade not an upgrade? MARTIN RUSS looks beyond clock speeds, caches and other computer confusion.

There is only one certainty connected with computers whatever computer you buy, and whenever you buy it, it will be virtually obsolete by the time you've got it installed. Previously I've commented on the ongoing rise in hard disk drive capacities, but while this is continuing, the specification of the moment is processor clock speed. Motorola and Intel seem to be leapfrogging each other with ever faster clock speeds. In the last year, we've seen clock speeds surge from 200MHz to 350MHz, and adverts are often out of date by the time they are published. An interesting example case is the Toshiba advert for their Tecra 750CDT notebook computer, which, in January 1998, claims that it has "the world's fastest mobile processor on board: Intel's 233MHz Pentium Processor with MMX technology." Even ignoring the new PowerBook G3's 250MHz chip, the PowerBook 3400 has had a 240MHz version for many months.

But I'm getting ahead of myself. The third generation of PowerPC chips from Motorola is now appearing in a new series of PowerMacs — the G3 series. After the nn0 series (such as the Quadra 650) of 68040-based designs, the first generation nn00 PowerMacs used the 601 processor, whilst the second generation (such as the 7300) used the 603 and 604 chips without changing the naming convention, and the third generation with the PowerPC 750 chip has prompted a new naming scheme — thank goodness! Could we stand the rather obvious nn000 PowerMacs as a name?

The 750-series processors are optimised for business and graphics applications, and accompanying them is a new Apple motherboard, of approximately A4 mini-ATX size, and just over a third smaller than the motherboard in a 7300. Smaller boards leave room for hard drives in the bottom of the casing, and this opens up the rest of the internal space for goodies like Zip or Jaz drives, extra hard disks, or CD-R writers. There's also a hidden advantage to smaller boards: they cost less (area costs money!), and in this case fewer layers of tracks and shorter buss lengths also mean improved performance and greater reliability.

I know it's been said many times before, but there really is more to a processor than the clock speed. The cache and the system buss that the processor sits on are also important. Caches are various flavours of fast memory which are dedicated to the processor's use. They are often overlooked when people increase their RAM, and frequently Macs do not have enough installed, which can impair performance (My 7300 has 1Mb!) For the 603 and 604 processors the top speed for the system buss was 50MHz (and 40MHz has been more common), but with the G3 processors this has been bumped up to 66MHz and an extra cache has been added. Harking back to the long-standing language differences between the US and the UK, the name of this new cache is rather unfortunate: I suspect that UK Apple distributors are going to play down the advantages of a 'backside' cache!

> "Whatever computer you buy, and whenever you buy it, it will be virtually obsolete by the time you've got it installed."

In basic terms, the specifications show that a 233 or 266MHz G3 PowerMac is approaching twice the processing power of the previous top-end 604 designs, so my 200MHz 7300's now low cost is reflected in its relative speed. But it's worth pointing out that chasing the leading edge of technology is a dangerous and ultimately futile pursuit, and a lot of the smart money goes on just-'obsoleted' technology, whose lower price and well-understood bugs, quirks and fixes make it an attractive alternative. Much the same thoughts apply to operating systems: MacOS 8.0 has some

APPLE NEWS IN BRIEF

• QuickTime 3.0

Apple have licensed Roland Corporation's Sound Canvas sound set and GS Format extensions for inclusion in QuickTime 3.0. This builds upon the rather limited MIDI sound set originally licensed to Apple by Roland Corporation in 1994. The sound-set in the cross-platform QuickTime 3.0 is claimed to have a full 128 GM-compatible instruments plus 100 additional sounds. With the increasingly good playback capabilities of software synthesizers, this should reinforce the use of QuickTime as a way of replaying GM and GS MIDI files. But I'll wait until I've heard it myself before I agree with Avie Tevanian, senior vice-president of Software Engineering at Apple, who has said: "...it is now possible to create high-quality MIDI music that can be reliably and faithfully reproduced on the consumer's computer."

Contact: http://www.quicktime.apple.com/

interesting features, but the prompt release of the free 8.1 upgrade gives some indication of the risk you run when you go for 'the latest'.

The rush for raw speed has so far played into musicians' hands. Direct-to-disk recording technology owes its success to the awesome processing power which a couple of grand now buys. But the new G3 PowerMacs seem to be focused more on mid-range graphics applications, with their inclusion of accelerated graphics — and the G3 chips do not seem to have the floating-point performance to match their otherwise excellent speed, which may be bad news for heavy DSP work. The RAM expandability of the current machines is limited to 192Mb, and the SCSI performance has not been extended to take advantage of the extra processing speed, which suggests that direct-to-disk applications may not benefit from the performance leap you might be expecting. This means that, as usual, upgrading is not a clear-cut decision — there are pros and cons to any purchase. The trouble with specifications is that they are often almost meaningless unless you know the story behind the numbers. And remember that Apple have stated that the G3 machines are not intended to make the 604-based machines obsolete: instead, they are intended for short term needs, which sounds like an advert for faster 604s — and remember that there is a 350MHz 604 chip in Apple's top-end server box!

UPGRADES

Every time a new, faster Mac comes along, there are always people who consider upgrading. Increasingly, the plug-in nature of today's (and tomorrow's) processors means that this can be done. Not that long ago (68040 to PowerPCs, for example) the only option was a complete board swap! But there are now some PowerPC 750/G3 upgrade products becoming available for the 100MHz-era PowerMacs, offering the attractive prospect of being able to more than double clock speed.

The rule with upgrades is simple: make sure that the upgrade is right for your computer, and consider the price very carefully. The compatibility bit sounds easy, but it's wise to make absolutely sure of what you're doing. After I had bought a cache and FPU card for my Mac IIsi, I discovered that it was incompatible with RAM Doubler — so for 10% extra speed and faster maths calculations I also had to buy more RAM! You can go back to the BBC model B (and probably earlier) to find a history of hardware add-ons that are fine provided you don't have anything else non-standard — like a graphics board, or a RAM slot-expander...

Thinking about the price sounds easy. But the IIsi catch mentioned earlier hints at the true size of the problem. There's always an alternative to buying the upgrade — buying the real thing. You need to consider the cost of a new model against the upgrade cost. This should take into account things which might be transferable (or not) from the old to the new machine, such as RAM or SCSI peripherals.

Unfortunately, in a lot of cases you'll find that the cost of an upgrade is annoyingly similar to the cost of a new machine, which leaves you with an agonising decision over which route to take. And beware: as my IIsi example shows, even when you've talked yourself into it, an upgrade can still end up costing you more money than you expected.

There's another alternative, which many people forget: buy a new machine and run two computers. With my 7300 and customised 610, I'm astonished by how often I can flip back and forth between them while they're loading, saving or otherwise engaged, effectively allowing me to do two tasks interleaved in time. This is especially useful when you're browsing the Internet, with its inherent download times, but any job where heavy processing or file manipulation can slow things down is also a winner here (audio files, perhaps?). Using two computers is also consistent with my often-repeated main maxim — if you use a MacOS computer for music, it should have a clean system comprising only Apple extensions and the music applications you use. Nothing else — no games, no neat little screen-savers. A second machine allows you to have a net-surfing, dirty, games drone with no worries about your music.

The catch with a second machine is that you'll probably need extra RAM, and you may need to connect the two machines together on a LAN (Local Area Network) if you want to avoid buying more SCSI peripherals — oh, and you need to read the license conditions for your software (which is a polite way of hinting that you may not just be able to run all of your software on both machines simultaneously).

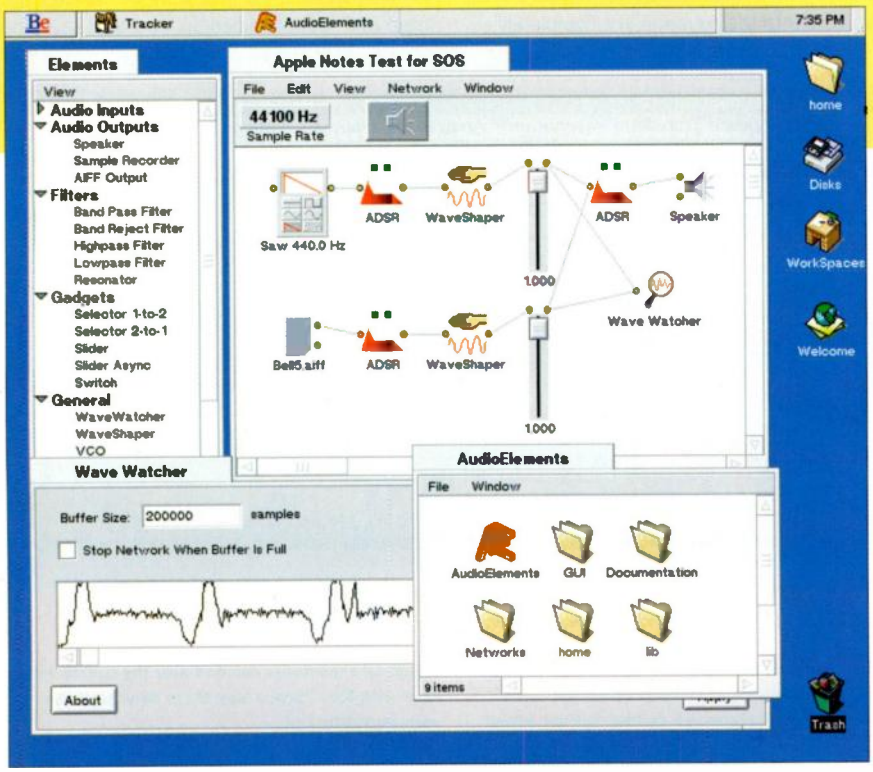
SPECS FOR MUSIC?

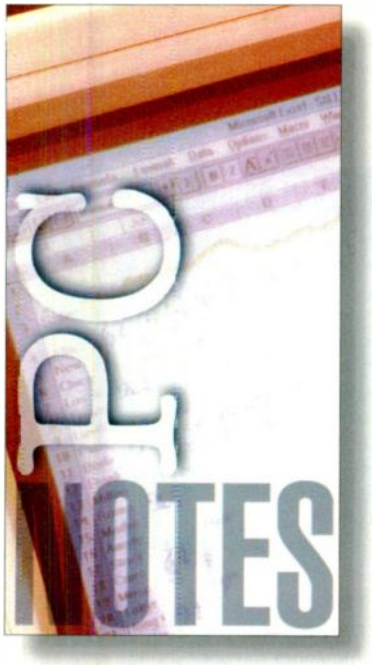
If you're buying a Mac for music, the list below features a few things to look for. A few to ignore are super-fast graphics capability, in zillions of colours, with 3D hardware acceleration. Spec-watchers' essential visits should include:

- **SCSI: As Fast and Wide as you can get. Fast is good, Wide is good, but Fast and Wide is better.**
- **PCI slots: audio I/O, DSP farms...**
- **Plenty of RAM capacity.**
- **Large monitor support.**
- **A quiet fan!**

GREMLINS

Last month's Apple Notes suffered from a visit by gremlins, and the screen-shot of Adamation's *Audio Elements* (as well as their web site URL, www.adamation.com) got lost somewhere. Apologies for the omission. If all is well, this time you should see...





MARTIN WALKER investigates processor overhead and finds out whether musicians can get mobile with a PC.

During my forays onto the Internet, I build up a picture of the problems that other PC musicians are having, and several things seem to crop up repeatedly. A particular source of frustration seems to be the problems encountered when running the latest MIDI + Audio sequencers on fairly modest PCs. Many people want to have a look at the new features, such as real-time effects and multitrack audio automation, and succumb to upgrading to the latest software version, despite the fact that their machine is not really up to it. This is not because they ignore the system recommendations, but because, in many cases, they have been running the previous version of the program quite happily on their existing machine. If version 3 of a program has been working fine on your PC for months, and version 4 comes along, advertising enticing new features for a small upgrade fee, it's almost impossible to resist. Even if you have a PC that's a bit under-powered, you tend to assume that you can still have a peep at all the bells and whistles, but still achieve the same performance as with the previous version when not using the new features.

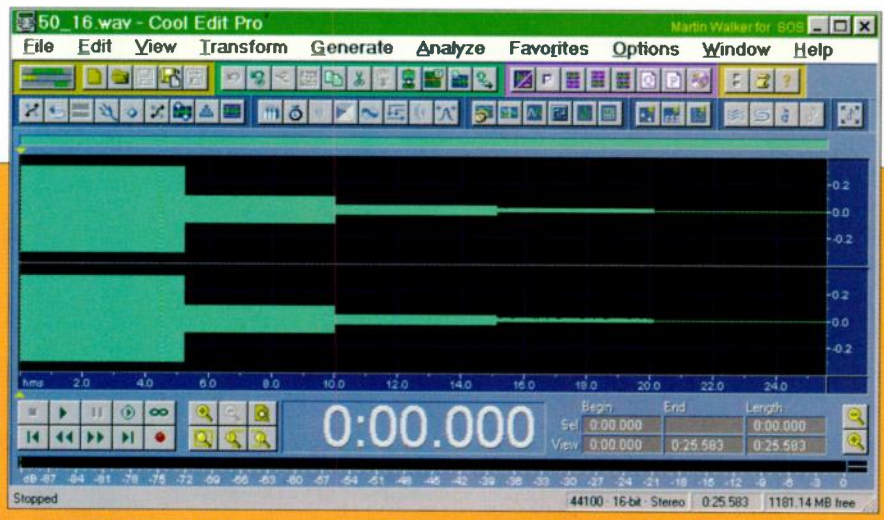
Unfortunately, most applications don't work like that, as I first found out a couple of years ago when upgrading one version of *Cubase Score* to the next, while still using a 486DX33 machine. The big difference between the two versions was the addition of basic soundcard audio support, but even when I was only using the MIDI facilities the quiescent processor overhead (proportion of the PC power being used when *Cubase* was just sitting there doing nothing) increased alarmingly, from 30% to 70%, and when playing a typical MIDI-only track the overhead increased from 70% to about 90%. In addition, the time taken to boot up the application doubled, from about 30 seconds to over a minute. Rather than limping on in this fashion (screen redraws became excruciatingly slow as well), I removed the upgrade, only re-installing it when I upgraded my PC later on.

Why should this be? Well, the most probable reason is that adding audio facilities and achieving stable timing requires the whole program to be optimised in a completely different way. Extensive buffering is used to smooth audio performance, and MIDI has to be integrated into the equation in a completely different manner. Simply electing not to use these new features doesn't make your software run in a similar way to the previous version — unfortunately life's not like that.

The moral of this story is that since manufacturers finally seem to be providing us with more realistic specifications for their programs, it's wise to heed them. Think of it this way: if you want to run all four of *Cubase VST*'s channel effects, you're asking your PC to be a MIDI sequencer, a multitrack audio recorder, and a multi-effects unit. Simultaneously! It's hardly surprising that you need more power than most other mainstream applications. However, the next *VST* update, to version 3.55 (see last month's news pages) will let you disable the Audio Engine, so perhaps those who have upgraded prematurely may yet be able to run their sequencer, or at the very least isolate any problems they have in running the new engine.

LAP DANCE

The other evening I had a call from a colleague who was considering buying a PC laptop for music purposes. After all, he said, you can now buy laptops with Pentium II processors and audio built in. Since he was going to be spending some months in France during 1998, the idea of a portable PC was very tempting, and his audio requirements were quite specific. He wanted to occasionally use the laptop for hard disk editing to compile an album's worth of acoustic music. Audio monitoring quality wasn't so important, as long as digital I/O existed so that the music could be loaded in from DAT, edited, tidied up, and then saved out ▶



The RME '50_16.wav' file for testing sound card dynamic range, shown here in Cool Edit Pro.

GETTING TESTY

If anyone wants to know yet more about their soundcard's performance, it's worth having a look at the very useful RME Intelligent Audio Solutions website. RME market the DIGI32 range of PCI 24-bit digital I/O cards (not yet available in the UK, as far as I can determine), and they cleverly advertise the merits of their products by making available digitally generated WAV test files, so that you can test your own card for comparison. The most telling file is 50_16.wav, which is a stereo sine tone at -50, -60, -70, -80, and -90dBFS (Decibels lower than Full Scale). If you run this you can instantly hear just how low a level is audible on your soundcard "with 96dB dynamic range". My new Event Gina card enabled me to hear the -90dB tone clearly. There are also some 24-bit files at even lower levels (-100, -110, -120dBFS) for those with more expensive equipment to try out. You'll need a WAV editor capable of 24-bit playback for these latter ones — *Wavelab* will do this, but not *Sound Forge*. As expected, I couldn't hear the -100dB tone at all with Gina. Have a look at the download page: www.rme-audio.com.

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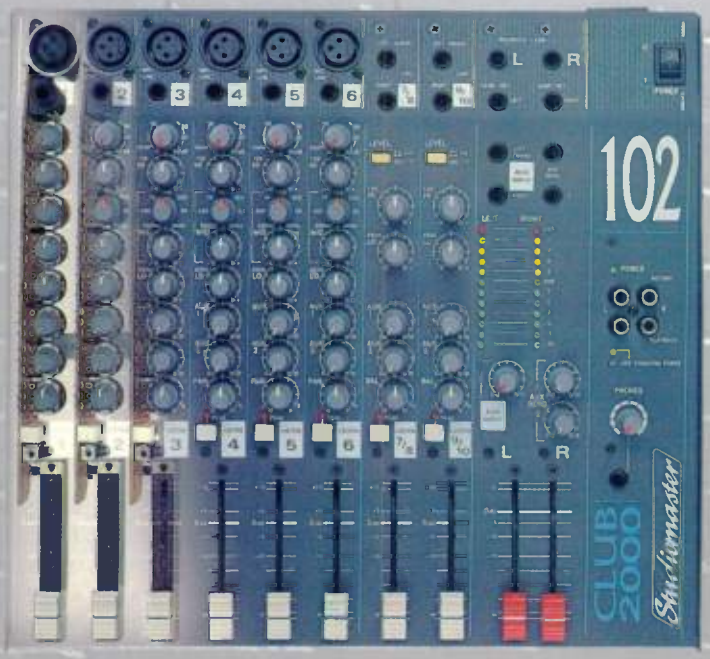

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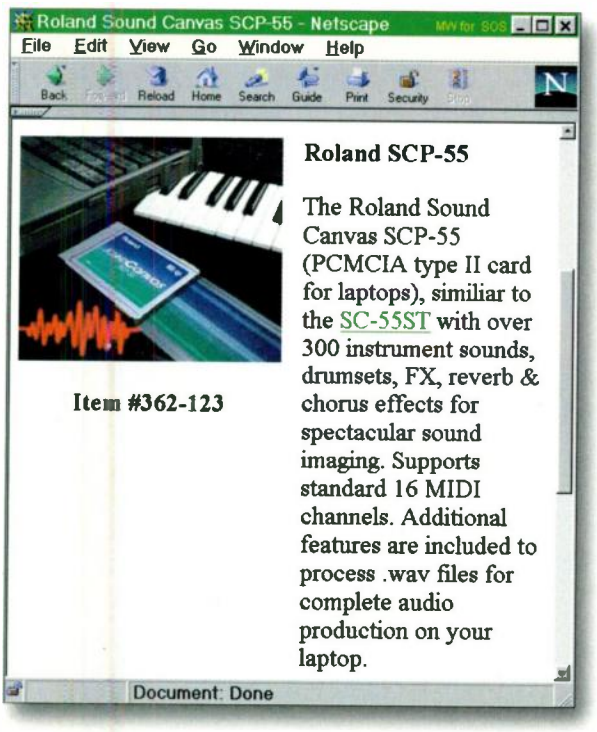
to another DAT for mastering. MIDI wasn't really a high priority in his case, but obviously would still be useful.

His proposition took me by surprise, as I've never before considered a portable PC for music work. Most musicians need lots of expansion potential to add soundcards, SCSI cards, MIDI cards... You get the idea. The thought of a comparatively sealed system seemed doomed to failure for audio, but I promised to look into it a little further. As I suspected, audio within laptops is often integrated into the motherboard to save space, and although in the past the chipset has nearly always provided SoundBlaster 16 capability (along with an OPL3 4-operator FM synth), machines are now appearing with a Crystal chipset, providing 16-bit processing (with the ubiquitous 3D spatialiser), along with Wavetable synthesis. There are various plug-in soundcards available to fit the PCMCIA (Personal Computer Memory Card International Association) slots, but again these mostly have SoundBlaster-compatible features for supporting games and, with a typical dynamic range quoted at 76dB, are hardly hi-fi. One that breaks the mould is the Roland SCP55, which is a PCMCIA card similar in spec to the Sound Canvas SC55ST (28-note polyphonic, 354 sounds) and available at the same price, about £250. This is expensive as soundcards go, but then laptop music production is not a mainstream market.



If you have a laptop PC, the Roland SCP55 will provide you with Roland's famous Sound Canvas MIDI sounds on a PCMCIA card.

Extra MIDI Ins and Outs are fairly easy to arrange for a laptop, as so many interfaces are available that can plug into a standard parallel printer port. None of the interface distributors I spoke to were aware of any significant differences when connecting them to a laptop rather than a desktop PC, although you might have to delve into the BIOS to change the parallel port mode on a few machines. If you want to run a MIDI system on a laptop, you should be able to do it with a humble 486 processor upwards (although modern sequencers including audio support will need a Pentium 133MHz or better) — even notebook machines are now supplied with a 16-bit stereo audio system. You can pick up a portable starting at about £1000, complete with Pentium processor.

If you want to add digital audio support, the situation doesn't seem quite so rosy. Although WAV file support is provided on most systems, the line output quality won't be good enough for mastering to CD, although it will be fine for demos and the like. However, after I did a search on the Internet, things began to look more promising: I found that Emu have recently launched the EMU8710, a PCMCIA version of the Creative Labs' AWE Gold card (Emu were acquired by Creative Labs a few years back). Only currently available from Emu Inc in the States, via the Internet (using on-line secure transactions), the big plus for this card is that it has the facility for an S/PDIF output if you add the optional 8710MABOX (MIDI/Audio Breakout Box). This would give excellent audio quality for WAV file playback, though the RAM provided is only 512Kb, which would limit your SoundFont capabilities.

Finally, returning to my original specific requirement of hard disk editing to and from a DAT machine, the search was fruitless — I could find no laptop-compatible product with a digital input as well as a digital output. If I'm deluged with information from manufacturers who have products that can do this, I'll let you know, but the chances seem slim, as the potential market is likely to be tiny. My colleague could use a 1Gb Jaz drive, record his hard disk audio with a desktop PC, drive to the south of France, plug the drive into the portable, work on it, and then transfer back to DAT via the desktop machine when he returns home, but I don't think many people will find this a practical proposition.

One possible solution in the future may be USB (the Universal Serial Buss), which is finally being fitted to new machines, both portable and desktop models. Since this has sufficient bandwidth for several channels of simultaneous audio, and is designed from the ground up to allow lots of devices to be plugged into any PC without opening up the case, it would seem ideal for laptop users. When USB audio peripherals start to appear, I'll let you know. Until then, I suspect that laptops may remain extremely convenient, but rather unsuitable for audio mastering. SOS

IN THE PIPELINE

• YAMAHA

One of the most interesting PC-related announcements recently has to be from Yamaha. A new PCI soundcard (the DS2416 — see the feature on new Yamaha products for 1998, starting on page 22 of this issue)) will be available by spring. Since many other soundcards are advertised as being suitable to have the famous Yamaha DB50XG daughterboard attached to them for additional sounds, it must have struck fear into the hearts of other soundcard manufacturers to hear that Yamaha are now going to release a soundcard as well. And what a spec! With two internal multi-effects based on the REV500 processors, and five of the same DSP chips used in the 02R digital mixer, this powerhouse will allow up to eight tracks of simultaneous recording and 16 tracks of playback. A pair of 20-bit stereo analogue inputs and outputs and 24-bit capable S/PDIF I/O will get your signals in and out, but for those who need more channels, the AX44 expansion unit gives four more ins and outs. The price for all this is expected to be under £1000 — better make sure you leave a spare PCI slot in your PC!

• PENTIUM PRICES

The word is that Pentium II processors will drop significantly in price during February, accelerated by reportedly slow pre-Christmas PC sales. Novatech (whose Bare Bones systems I mentioned in the January issue) have just introduced a Pentium II 233MHz system at under £1000. Those of you out there with a suitable monitor screen already can also buy the PC alone for £699 plus VAT. Contact Novatech on 0800 777300.

• WAVES

Waves are busy working on an improved DLL file (engine) for their excellent *Trueverb* plug-in (mentioned in this month's feature on PC plug-ins, starting on page 100), to make it more efficient without sacrificing sound quality. They kindly sent me a beta version of the file to test, and it does significantly reduce processor overhead in my P166 MMX machine, from 67% to 57%. I'll let you know when the officially released update happens.

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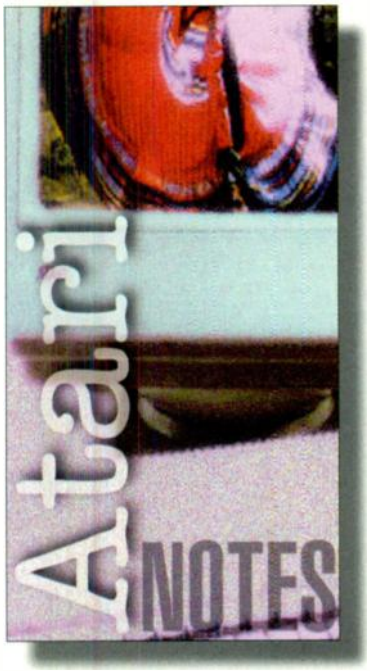


Atari users can find a huge resource of software and information on the Internet. DEREK JOHNSON goes fishing.

Last month's I mentioned two new Atari fanzines, and this month I'd like to add the FaST Club's nifty on-line mag, *ST Applications*. It's light on music, but still has plenty to offer ST users in general. The site also features the club's excellent catalogue of PD/shareware software, plus other goodies. You can find them at www.cix.co.uk/~sta/; the net-less can use PO Box 101, Nottingham, NG2 7PP (Tel: 0115 945 5250). All five issues of *AtariPhile*, the on-line/disk mag for all Atari users that's been mentioned a few times in this column, can be downloaded from www.users.zetnet.co.uk/cfm/

THE NET SET

In a general browse around the Internet, I found a great page of mostly up-to-date

The FaST Club's home page, containing the on-line magazine ST Applications.

Horizon's hardware MIDI expander, available from the Atari Home Page.

Atari-related links at the Atari Reference Desk (www.geocities.com/SiliconValley/Peaks/6320 /links.htm). It's part of the web site of Terry K Ross, the US distributor for the new *ST+* magazine. (Recent URL changes and sites that use frames are indicated in the list.) I found one or two sites I hadn't encountered before, and actually turned up a few new bits of PD software. And if ARD's links aren't enough for you, the links often lead to lists of more links. One such link that I found via ARD was www.geocities.com/SiliconValley/Bay/8745 /atari_midi.html, a list of useful sound and MIDI sites and software. This in turn led me to the Sustenance Atari MIDI and Sound page (sustenance.va.com.au/d/atari.html), the music list on the web site of one Peter Sansom. Here I discovered *Ravel*, a set of programs that provide a programmable algorithmic composition environment for the ST, with some graphics-handling capabilities (*Ravel* is also available for PC). I also discovered *Formula* (FORth MUsic LAnguage), a FORTH-like MIDI programming language for computer music. Using *Formula*, you can write programs that compose and play music using deterministic or random rules, represent and perform interpretations of musical scores, and interact with a human performer. A Mac version of *Formula* is also available.

Another link (www.ief.u-psud.fr/~thierry /welcome.html) took me to Thierry Rochebois' *Paradoxicalator*, a tiny freeware program that allows you to play melodies with paradoxical scales on MIDI synthesizers. You just need an ordinary polyphonic synthesizer and an Atari to discover this kind of musical scale. And what is a paradoxical scale? I'm glad you asked: in a nutshell, it's a scale where one extreme of the scale, rather than being double or half the frequency of the first step, is the same frequency: play a C major scale, and the top C won't be double the frequency (an octave higher) of the bottom C, but the same C! It's sort of a circular scale. Try it!

The Sustenance list also has a page dedicated to *C Sound* links; *C Sound* is a multi-platform digital synthesis program, and one of those platforms is the Atari. This isn't the most sophisticated version of the software, but it allows the Atari user to dabble.

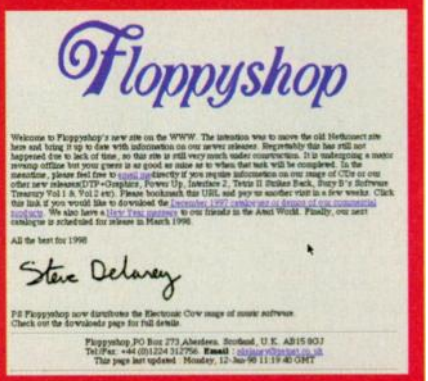
EDITORS CHOICE

Check out the Atari Home Page (aspects.net /~horizon/atari.htm) for a fab collection of PD Atari-based synth editors, priced at just £3 each. When you buy with a credit card, your editor will be emailed to you the same day. Editors are available for a huge range of Emu, Korg, Roland, Kawai, Casio, Yamaha and Ensoniq synths. The site also lists a range of hardware, including a £13 MIDI expander for your modem port (see above left).

Knight Industries is the alter ego of student David Knight, and his web site is at www.ritter.demon.co.uk/index.html; of particular interest is a freeware sample recording and editing program called *Sam-Edit 2*. This is currently in development, but a beta version can be downloaded from David's site. The software runs on any Atari, and requires just 72K of RAM to run. There are loadable modules for supporting a variety of file formats, including AVR, WAV and SAM. SOS

FLOPPYSHOP ON THE MOOVE

Floppyshop have acquired exclusive UK distribution rights to the entire range of Electronic Cow music products. Electronic Cow software has been featured often in these pages; the range consists of the *MIDI Arpeggiator*



Floppyshop, who are now UK distributors for Electronic Cow's range of musical software for the Atari.

analogue sequencer/arpeggiator (£15 plus postage), the *Sound Chip Synth* which extracts musical tones from the Atari's sound chip (£10), and the *Snippit Synth* granular synthesisis tool (£16). Floppyshop intend to provide the software with a free technical helpline. Contact: Floppyshop, PO Box 273, Aberdeen, AB15 8GJ. You can ring their credit card order line on 01224 312756, email sdelaney@zetnet.co.uk, or check out their web page at www.users.zetnet.co.uk/sdelaney/ floppyshop/

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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.

MAKIF

Recording Venue: Home and Progress studios, Derby.
Recording Equipment: Akai S950 and S3000 samplers, Atari running *Cubase* sequencing software, PC running *Cakewalk Audio* audio sequencing software.

Makif not only records hip hop but plays it live around the Derby area on the university and club circuit. His first track was recorded at home, and the second at Derby's Progress record label studios.

The first mix of 'Schizophrenic' begins with a bit of film or TV soundtrack about split personality, which is used again later in the mix for breaks. For this track to be successful it has to really live up to the title, and Makif achieves this by introducing moments of tension over a basic hip hop drum and bass loop. Samples of whispered vocals work in some places as counter-melody with the rapped vocal line, and in other places with the vocal sample, and a repetitive vocal squawk is treated to a dollop of echo and used to heighten tension. Lyrically, the track is strong, and the voice is placed high enough in the mix so that you can catch every word. The actual sound of the vocal is a little hard, but it works well in this thematic context.

The radio mix goes for a more direct approach, with an organ-stabbed chord or two and lighter reverb treatment on some of the vocal samples. The punchier sections of scratching are also mixed louder, and the general approach of this mix is more energetic and direct.

The next track, 'We got the funk', is more standard fare, with some well chosen samples incorporating trumpet lines, Hammond chord stabs and electric piano chords. Judging by the sound quality, all these have come off albums from the '70s, but Makif doesn't say whether he's sourced the sounds himself or got them from CDs. The low-bandwidth, scratchy quality of some of the sounds is counter-balanced by the drum and bass loop, which is warmer and fatter than the other samples. Again, the vocal is placed up-front in the mix, but this time its rather scratchy quality would have been improved by a cut of a couple of dB at 2kHz.

Later tracks don't have the same production quality as the earlier mixes. 'My Crew' seems to have lost a lot of frequencies in the lower-mid 150-300Hz range, and needed a mighty 8dB cut at 4kHz to get the upper-mids under control. I suspect that this one has been over-enhanced somewhere along the line. ❑

WILL MORLAND

Recording Venue: Home
Recording Equipment: Tascam 464 Portastudio, Beyerdynamic M500 mic, Alesis Nanoverb effects.

Even with a limited setup Will has still managed to come up with an interesting demo. I particularly liked the use of a Grenadier Guards marching band sampled through a pedal delay and slowed down to half speed. This loop was then used in the opening rhythm of the song, mixed in with a drum machine. The large amount of reverb on the sample does fudge the rhythm, but I think it's necessary to make the whole thing gel. As a piece, it ends up sounding quite industrial in places, and in others the odd combination of synthesized voices, whistles and clangs has some appeal as an off-the-wall movie soundtrack.

Fortunately, Will is aiming at creating music for movies. I'd suggest he tries offering some of this material to film or media course students working on projects, because it definitely evokes a quirky creativity. I particularly like how Will has obviously felt able to experiment with the sounds — for example, by feeding some sounds through a practice amp for a touch of distortion. This works for the drums and bass on the second track, but not really on the organ sound, which has ended up too distorted. Some of the attempts at spinning in rhythms are slightly off the mark, but this disjointed quality does have some appeal. Another nice touch is the looped noise that finishes the piece.

Typically, the final track on the demo features a backing loop of clanging ashtray and drainpipe, passed through the Nanoverb, with a groove rhythm set up on the drum machine, and real bongos, the last miked up in a hallway for real ambience. This is by far the best mix on a demo which suffers a little from poor sound balancing. The electric violin plays a more prominent and welcome role too, and the low bass sound is weighty and solid. Will worried about the bass on the mix — probably because it contains so much energy in the very low frequencies. Some of this could be rolled off with a decent EQ. Even a simple low-frequency shelving EQ at 45Hz with a couple of dB cut would have done the trick. ❑

THE TWO FUNKETEERS

Recording Venue: Home.
Recording Equipment: PC running *Cakewalk Pro Audio* audio sequencing software, Fostex D80 8-track hard disk recorder, Tascam M2600 mixer, Yamaha REV500 effects.

I hope Paul and Steve aren't taking themselves too seriously when they bill themselves as the two funketeers. Their over-long synthesized intro to 'Fistful of Funk' bears little relation to what follows — a rather limp attempt at a funk workout which simply lacks guts. I guess that the drums are funk sample loops, as no drummer is credited, and these are well chosen and put together, although somewhat lacking in bandwidth. This lack of presence on the kit makes the production sound more of demo than master standard, and a boost of about 6dB at 10 or 12kHz may bring up the noise a bit, but it certainly kicks some energy back into the production. An enhancer would probably have a similar effect, but with less noise.

I have to criticise the arrangement, which is too long, especially as the groove isn't happening enough to retain the interest. However, there's some neat soloing on synthesized vibes to rescue the track. Brass plays an important part too, but it's not snappy enough to pick the track up. This is really down to the programming, so I'd suggest having another stab at the stabs.

'The Grand Terrino' proves to be a much more successful number, and not just because it's upbeat. The groove is better — a standard '70s-style bassline underpinning some more well-chosen drum loops. Given that the keyboard playing is pretty good, I would have liked to hear some of the clavinet funk playing more up-front in the mix. This goes for the guitar too, where some neat wah guitar is really just tickling away in the background, when it could be showcased a bit more. Watch out for some of those thin sounds, though, which probably wouldn't bear closer scrutiny.

This demo features some good ideas, in a style that really should be capitalised on now — especially the synthesized loops and low groove of the final track — but overall it's more breakfast than Brekker! ❑

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KIERAN JAMES FARROW

Recording Venue: Home.
Recording Equipment: Mackie 1202 mixer, Tascam 488 8-track, Alesis Midiverb 4 effects, Shure SM58 mic, Tascam DA20 DAT, Alesis RA100 amplifier, Alesis Monitor 1 speakers.

Kieran's attempt at bribery (including a packet of Munchies with his DAT tape) unfortunately backfired. The Munchies were cruelly crushed by an uncaring postie, and as a final twist of edible fate I was still able to make out the sell-by date — the first of January 1998!

The music is pretty contemporary in style, going for a groove rhythm section and a simple, ethnic-styled melody to get across the intended hypnotic musical spirituality. It's difficult to make a guess at the exact language Kieran is singing in, but it's probably Asian in origin, sung in a British style. The groove works very well, and that's largely down to the bass playing of Pat Tulser, who sounds as though he's from the Jah Wobble school of playing. The bass sound is also very warm, and in perfect contrast to the transparency of the programmed drum sounds.

As a track, everything works well, apart from the electric guitar, which witters away in the background in a sort of rock jam. Some more interesting parts — involving quarter-tones and ethnic scales, for example — could have been written to complement the song. The guitar *sound*, however, heavily overdriven and smooth, does suit the overall production sound.

'Where have you gone?' is a slower track, once again relying on a groove to underpin the song. Here, the production sound relies heavily on the drum parts, some real and some programmed. Kieran has attempted to match the real sounds to the triggered ones by adding quite a lot of top and upper mid, but I'm not sure if this was the right approach to take. Complementary drum frequencies — some more in the low range, for example, would have given the track a bit more weight.

Speaking of which, Kieran has a very light and breezy vocal style, to which he has either matched the instrumental production, or sung to match the backing. Personally I'd have liked to hear a song where he had to put a bit more effort into the singing — just to know what he's capable of. ❑

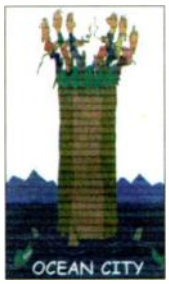
demo DOCTOR

QUICKIES

SENSE AMELIA have sent in another good offering, once again mixing live instruments with samples as a backing to the vocal talents of Deborah R Kelly. Her close-miked jazz/blues style of singing suits this instrumental cocktail well, and is a good selling point for the band. On the technical side, the bass is mixed too high on the first track and I'd say it's giving trouble to the compressor, which I assume is strapped across the whole mix. While the first track has very much a band style of production, the second goes for a more studio approach, but the mix is let down once again by too much bass end. It's a difficult decision to turn the bass down when you have a great-sounding, weighty dub bass coming from your speakers. In truth you're actually trying to add something that the monitoring equipment probably just doesn't deliver. Try listening to the mixes over a range of speakers and then go for a remix. Otherwise, great songs and singing!

MURKLE BAY SOUND is actually a studio in Thurso, Caithness, and Bryan Dods is the man in charge. He's sent two tapes in — one from a band called Weep, and the other from a boogie band called Barracuda, for which Bryan plays drums. The latter is pretty standard fare, played with a lot of enthusiasm but with a bit of a scratchy production. The rhythm guitar seems to be the major culprit, but the vocals are also harsh in the 2kHz area. Otherwise, it's not a bad demo — I particularly liked the mellow brass on 'Ain't No Sunshine', which, incidentally, had a good drum sound too. As for the Weep tape, Bryan's attempt to hide the off-pitch backing vocals with loads of reverb isn't going to fool anyone. There's plenty of heavy guitar on the first song, but by the second song the band sound like a different outfit altogether, moving from heavy metal to lightweight guitar pop. I like how the production sound changes, especially the use of a tighter snare sound and a more up-front vocal in the mix.

OCEAN CITY is brothers Stephen and Stuart Howe, and their demo is aimed at the pop/dance market. They make a play for record company interest by including a dance version of the '60s hit 'Who Loves You', by the Four Seasons. This doesn't quite do it for me, for two reasons. Firstly, the drum part in the verses just isn't a dance one, and the changes from verse to chorus cause the track to lose momentum. Secondly, there's little point in attempting this kind of material unless you've got a terrific or original-sounding voice, and hiding the vocal with reverb and modulation (or is it double-tracking?) really betrays a lack of confidence in the voice.



The second track has a nice instrumental balance, but again features some dubious modulation or double-tracking effects on the lead vocals, which lose clarity as a result. As for the opening song, 'Love Won't Wait', the production is a bit sparse and the continuous 16th-note twanging synth loop is mixed too loud. After a few bars this becomes an irritating distraction from the sung melody, and the piano chords and strings should really have been mixed louder, to give the production more drive and impact. Many musicians are seeking to find a new lease of life in dance production at the moment. It may be harder than you think to make a good job of it.

STEF GOODCHILD is one of those who's made the jump from rock into dance quite successfully, by taking what he's good at — playing rock guitar — and using it within a jungle-style context. The guitar is used sparsely but effectively, with the odd riff here and sound effect there built into a dance-style arrangement of breaks. Stef has used Mac-based hard disk editing to manipulate the guitar on this first track, by cutting and pasting various sections into the arrangement. I think this method could have been adopted for some more of the instrumentation or vocals, to make a bigger production and a longer mix, if required. Some of the programming and choice of sounds bears a resemblance to the work of Underworld, and nowhere more so than the well mixed second track, which has a big, warm sound with some classic dance drum voices, a fat bass from the Novation BassStation, and interesting panning of upper-mid synth voices, which are pan-echoed for good measure. Excellent.

SHINE: This appears a while after its release, but nevertheless stands the test of time as a good slice of trippy dance that could have a really wide audience if exposed to the general public. It has a good pulsating beat with a nice accent on beats one and three, vaguely Eastern vocals cunningly sunk into the mix, and a wide stereo mix. The cassette sounds a bit thin and wispy in the top end on my monitors, but that's probably because it's been mixed for radio airplay.

COLIN HOUGHTON sent in his submission with a fun letter, and I can tell from this that he doesn't take his musical doodlings that seriously. Now I know why his tape's called *Essence of Giraffe*. Doodling is certainly the right term for his first track, which features a harmonised vocal which is pretty difficult to decipher and a robotic backing that wouldn't be out of place on a children's TV show — perhaps he's missed his vocation in life. I did notice the allusion to Kraftwerk: the riff from 'The Model' was thrown in just once. Otherwise this was a track that made little sense to me, as I couldn't understand the lyric. The second track seems to take things a bit more seriously, with a kind of synthesized version of the rhythmic start of 'Money', by Pink Floyd.

Again, the robotic theme is taken up, but this time a sampled soundtrack is used, and in a strange way it humanises this otherwise Germanic-sounding synth instrumental.

ELLIS BREEN's music is influenced by classical material from such composers as Holst and Stravinsky, plus more contemporary styles such as trance, jungle, drum & bass and house. With such a wide range of influences, you may well be wondering what he's come up with on this demo. Certainly the mix is odd. Interestingly, he's chosen to pan individual sounds very wide, and whether this is out of choice or simply a limitation of the Atari Falcon *Octalyser* he's using, I can't tell. Panning the bass all to one side does load the level of the stereo image in favour of that side, but there are occasions when there are two bass parts running and the sound is more evenly matched. The frantic opening mix features a lot of arpeggiating, and varying basslines against jungle and house beats. Some of the bass end is too heavy in places, so a hint of overload distortion is introduced, but this may be uncontrollable on the system he's using. The triggered sounds are also rather low-bandwidth, so some HF boost aids clarity, but this is not a bad demo given the limitations of the gear.

FLOATING POINT: Rod Mansell, writing on behalf of Floating Point, is well pissed off! Having received no feedback from the 100 or so CDs they've sent out, and no reviews at all, they're feeling somewhat frustrated — or were when they sent the letter out. By now they've probably even given up on getting a review from *SOS*! Still, as one of my friends who read the letter said, rather unsympathetically, "join the club!"

My impressions of the CD are that the mixes are pro-standard, with a big sound and good use of stereo imaging, especially where effects are used. The opening instrumental doesn't really grab me, tending to labour on the same beat and take too much time to develop from one section of the arrangement to another. My favourite is track seven, 'Re Freak'. The sampled ethnic voice is what grabs me on this composition, and I also like the punchy use of looped synthesizer. 'Esto se Masca' features nice reverb and delay treatments on percussion and marimba, and a big dub bass line, but there are far too many other tracks with filter-sweep chordal openings for my taste.

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brief encounters

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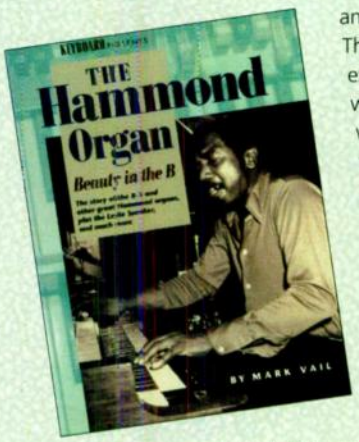
THE HAMMOND ORGAN: BEAUTY IN THE B

Few keyboard instruments are as fascinating and awe-inspiring as the Hammond B3. The combination of ingenious electro-mechanics, valve amplification, innovative loudspeaker technology, and the inherent 'rightness' of the performance facilities have made this machine a classic and a legend in its own lifetime.

Mark Vail (an associate editor of the American *Keyboard* magazine) has collated an enormous wealth of information concerning the Hammond B3, the Leslie speaker and much more besides. If you find it hard not to drool at the sight of a rack of tonewheels, or you get your kicks watching Leslie horns speeding up and slowing down, this book is definitely for you. If you're slightly more in touch with the real world but still want to know how to play the beast, should you ever be confronted by one, this book is also for you. Finally, for those of you who are sad enough to be content with feeble MIDI synth imitations of the Hammond, but want to know how to play those classic Hammond riffs, there's something in here for you too!

Beauty in the B contains 240 pages, each crammed with information and divided into 10 chapters, starting with a history of the Hammond company and the electric clock that began it all, and describing the ancestors to the B3 and its many variants. There's also an excellent chapter on what to look for when buying a tonewheel organ, and how to keep it in good shape, and the story wouldn't be complete without a chapter on Don Leslie and his 'revolutionary' speaker designs.



Technicalities dispensed with, the book moves on to performance issues, with an army of keyboard legends revealing their favourite drawbar registrations and playing styles. The infamous '25 Hammond Licks You Must Know', by Dave Amels, is also reprinted, as a guide to the most characteristic playing techniques, registrations and Leslie effects.

The book rounds off with a comprehensive list of useful contacts, other books, web sites, and recommended listening. All in all, it's excellent, with something for almost every keyboard player. *Hugh Robjohns*

The Hammond Organ: Beauty in the B, by Mark Vail, is published by Miller Freeman Books, ISBN 0-87930-459-6. Its UK price is around £26 (depending on prevailing exchange rate).

LOVETONE WOBULATOR STEREO VIBRATO/TREMOLO PEDAL

Despite the huge technological advances over the last two decades, it's surprising how many *SOS* gear lists have people still swearing by vintage effects boxes such as the Electro Harmonix Electric Mistress Flanger, probably because they have a character often lacking in modern designs.

Lovetone were inspired by the classic sounds of yesteryear, but are firmly rooted to today's technology, which tends to be quieter and more reliable. Under review here is the latest model in their range — the Wobulator, which provides a twin-oscillator tremolo/vibrato with extensive modulation possibilities.

The Wobulator is hand-built in the UK and has an all-metal casing. It's powered by PP3 batteries or a 9V PSU (not supplied). Along the top of the front panel are a pair of output sockets (L/Mono and Right), a pair labelled Pedal and Trigger (we'll come back to these later), a PSU socket, and a Mono input, which also powers up the unit when a jack plug is inserted. All sockets are quarter-inch jacks, apart from the 3.5mm PSU socket.

In essence, the Wobulator provides stereo movement in a foot-controlled unit, using a rotary LFO1 rate control, with independent Depth for left and right channels. Twin footswitches provide individual on/off for the effect on both left and right channels, and these are usefully spaced so that you can stomp on them both together. There are four switched modes: Tremulant provides the classic in-phase tremolo effect, although the left channel is low-pass filtered, while the right is high-pass filtered, giving a subtle stereo spread as well; Panner provides the classic auto-pan side-to-side sweep, moving both channels in anti-phase; Vibrato operates like Tremulant, but in anti-phase, so the different filtering in each channel creates swirling harmonic effects; Dual Trem is the final option, and this brings into play a second LFO for independent speed control of the right channel. Further options are provided by a four-position waveform switch for the LFOs, giving either a triangle or square wave, and the same option for the second LFO in Dual Trem mode.

The Pedal socket allows a footpedal (or switch) to be used for real-time LFO1 speed control (although you'll need a high-impedance pedal), and can also switch between full speed and front-panel speed. The final socket, marked Trigger, allows the LFO1 waveform to be held when any voltage greater than +0.7 volts is applied, and re-triggered on its removal. This lets you sync the effect to an external track. Because the controls all interact, a huge variety of amplitude effects is on offer, and the filtering options supply a lot of harmonic movement as well. I suspect that the more off-the-wall effects will be found via the external triggering mode, since this provides many possibilities for dramatic stereo gating effects.

Lovetone units seem to be attracting a cult following for their ability to provide sounds that are rather different from the rest, and which give a huge amount of control in an immediate and obvious way. Their impressive client list includes the likes of Blur, Bootsy Collins, Coldcut, Nellee Hooper, Steve Levine, Mansun, Oasis and the Stone Roses. Producers and engineers have taken to them for outboard use, due to their idiosyncratic approach and excellent audio quality. All Lovetone products are only available via mail order, are built to order in small batches, and have a money-back guarantee. If you want to extend your stereo panorama, you'd better get moving. *Martin Walker*

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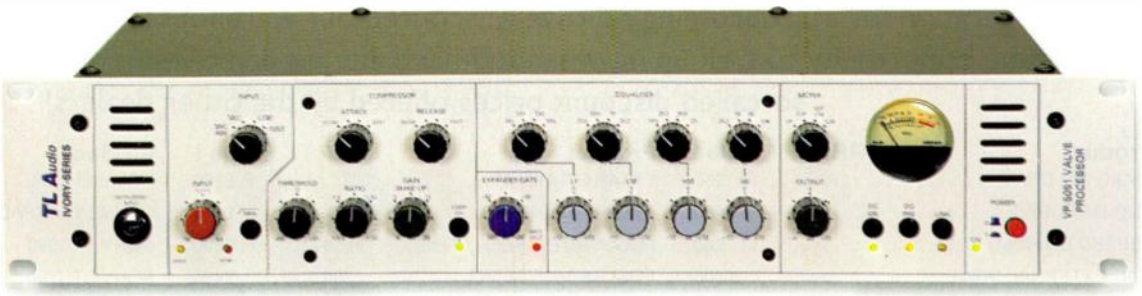

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TL Audio VP5051 Valve Voice Processor

QUESTIONS

1. Which of the following is another range of TL Audio Processors?

a. The Aluminium series ☐
b. The Ebony Series ☐
c. The Indigo Series ☐
d. The Fourth Test Series ☐

2. Which of the following is a control in the compressor section?

a. Threshold ☐
b. Restraint ☐
c. Assault ☐
d. GBH ☐

3. Which of the following types of audio input is NOT offered by the VP5051 Voice Processor?

a. Mic ☐
b. Line ☐
c. Instrument ☐
d. ISDN ☐

Would you like to receive more information on TL Audio products? If not, please tick this box. ☐

TIE-BREAKER

We've seen TL Audio take us through the eye-catching Crimson range of Processors, the luscious Indigos, and now the post-modern Ivories. Suggest what colour scheme they might assault our ocular nerves with next, and why, in not more than 30 witty, thought-provoking words please.

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Post your completed entry to: *SOS TL Audio Competition, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.*

TL Audio Competition

You've spent every last penny of your savings on your computer, keyboards, mics, guitars and speakers; you seem to have every tool necessary to realise your musical vision. But still, it's not enough... your recorded sound still lacks something... a certain fullness and presence. Perhaps your productions could benefit from the injection of a little valve warmth. Fortunately for two of you lucky people out there, TL Audio have been generous enough to offer two VP5051 Valve Voice Processors for our competition this month, which could provide the answer to your problems.

TL Audio are no strangers to the world of quality audio outboard, having bombarded us over the last few years with their Classic Valve series of processors, the Crimson Solid State series, the Indigo budget valve series, and now the replacement for the Indigos, the affordable Ivory range of valve gear, of which the VP5051 is the first to be released.

Reviewed in last month's SOS, the VP5051 can be used to process more than just vocals, as its name might suggest. The processor includes all the features of a stand-alone mic preamp, compressor, and EQ in one package — and there's even an expander/gate to help cut down compressor-induced noise. What's more, there are input options for mic-, line- and instrument-level signals (such as those from an electric guitar). The high-impedance Instrument input is conveniently located on the front panel, and the mic input provides 48V phantom power for easy use of microphones which require it.

The compressor has a full complement of controls: Attack and Release, Threshold, Ratio and Gain make-up. The EQ is similarly fully-featured, with control over four frequency bands (low, low-mid, high-mid, and high), with 12dB of boost or cut in each band. That's not all; an EQ In/Out button allows for rapid comparison between EQ'd and untreated signal (ideal for the end of those late-night sessions, when you're not sure if your frantic EQ twiddling is actually helping to improve your sound or not), as well as for keeping your signal path as short as possible when you don't need the EQ at all. If you decide that your vocal signal is badly in need of EQ before it even gets to the compressor, this rearrangement of the signal processing path can be achieved with a quick press of the 'EQ Pre' button. We're not finished yet: although it's not obvious from the front panel, the VP5051 also offers a side-chain input, allowing you to connect another compressor, EQ, or gate for de-essing or level-ducking duties.

All you have to do to win yourself one of these two fabulous VP5051s is EQ your IQ and answer the selection of questions and tie-breaker in the box to the left. Oh, and ensure you get your entry to us by the closing date (**Friday, 3rd April**), of course!

the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd and TL Audio, and their immediate families, are ineligible for entry. 3. No cash alternative is available in lieu of the stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prizewinners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.

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Hit & Miss

KORG S3 RHYTHM WORKSTATION

The S3 was Korg's 1991 attempt to apply the M1 workstation approach to rhythm and sequencing, but it never attained anything like the success of its more famous keyboard sibling. PAUL NAGLE explains why.

The Korg name isn't exactly synonymous with classic drum machines. Neither Korg nor Yamaha ever acquired the uncanny instinct for success in the kickin' department possessed by fellow countrymen Roland. One of Korg's better efforts in rhythm was the S3, which was sadly miscast as one of those do-everything instruments that you just *know* won't.

The success of the M1 workstation had been a welcome shot in the arm for Korg and, in typical Japanese fashion, they applied the same philosophy in creating the S3 Rhythm Workstation. It took almost two years after the S3 was announced for it to finally hit the streets and when it did, in the early months of 1991, it was accompanied by a whopping price tag of £899. This was serious money for a drum machine, though not, perhaps, so outrageous when you realise the scope of the S3's ambition: a merging of sequencer and drum machine, with twin internal effect processors, SMPTE sync, two MIDI outputs and an impressive range of programming options.

DESCRIPTION

Encased in sleek black plastic, the slimline and classy S3 has much in common with the M1, in terms of its appearance. The controls are distributed tastefully: a single volume slider, alpha dial, four soft keys, shift, page and +/- keys, plus standard sequencer transport buttons, all spin an illusion of thoughtful design. Eight plastic velocity-sensitive pads (with eight different velocity-response curves) let you tap in your rhythms or play along with an existing pattern or song. A button switches banks between pads 1-8 and 9-16 of the current drum kit and, despite being very noisy (like a clunky old computer keyboard), the pads are actually quite responsive and playable. One gripe is that there is no dedicated tempo control, which I think is unforgivable on a drum machine. Instead, you have to use a combination of the shift key and the pad button, and you can then tweak tempo using the alpha dial.

A small 2-line x 24-character backlit display is the window on a rather labyrinthine operating system. Operation is rarely intuitive, and even after several years' use of the S3 I still feel a little intimidated when I need to stray away from familiar territory.

In addition to stereo outputs, Korg have thoughtfully provided four individual outputs for those times when the onboard effects aren't enough. Staying with the generously-endowed rear panel for a moment, three card slots allow two PCM and one data card to be plugged in, thus boosting available sound sources and sequencer memory. Two footswitch sockets can control start/continue and pad bank switching, or even act as one of the pads (with a flat velocity response) — such as the kick drum, for example. Twin MIDI outputs and a MIDI input fill the remaining space.

SPEC CHECK

So what makes the S3 tick (and, indeed, kick)? Spec-wise all is peachy: samples are 16-bit, polyphony is 12 notes, timing resolution is 192 pulses per quarter note. A maximum of 30 songs and 100 patterns can be stored internally, along with 160 timbres (80 programmable and 80 preset) and 20 drum kits (10 user, 10 preset). This all sounds healthy, until you realise that the overall memory is just 33,600 bytes. A single note uses 4 bytes, so the S3's overall note capacity is 8,400 notes. This is fine for a drum machine, but for a real-time sequencer intended to be the heart of a MIDI studio, it's positively stingy. Waggle some MIDI performance controllers and watch those bytes disappear! A RAM card can hold a maximum of 31K of extra sequencer data (or less if the card is formatted to hold additional drum kits) but in practical terms this memory restriction meant that the S3 was a closed system as far as sequencing was concerned.

MIDI

The S3's two assignable MIDI outputs get the thumbs-up from me. It's useful to send, for example, MIDI clock (or MIDI Time Code) via one output and note data via the other. Each output can function as a combined (soft) Thru and Out simultaneously. Perhaps with the limited memory in mind, Korg added comprehensive MIDI filtering options to enable the filtering of control changes (not selectively, I'm afraid), program changes, pitch-bend, aftertouch, and even note or velocity data. Up to four drum kits can be played at once, on up to four MIDI channels, and can be switched during performance via MIDI program changes. A separate channel controls remote selection of the 16 internal effects patches. Unfortunately, the S3 does not respond to MIDI Volume control (CC7).

PRICE & AVAILABILITY

An intimidating launch price, plus a lack of focus on what it actually was, ensured widespread indifference to the S3. These days you can find them for around £150, and I'd advise that you don't pay more than £200 for one unless maybe some additional PCM cards are included. Make sure you get a manual, because without it (or perhaps even with it!), you might find it more of a challenge than you'd imagined.

JACK OF ALL TRADES, MASTER OF ONE?

The S3 takes a rather novel approach to its drum sounds, by splitting many of them into two: the initial hit (drum head) and the decay or body (drum shell). Quite how this is achieved isn't totally clear, although I suspect that some kind of resynthesis technique was used. However it was done, you're given ample tools for tweaking the rather conservative selection of kicks and snares and the excellent toms. The final drum sound is made by recombining any two of the 75 internal waveforms. You're not forced into building a bass drum from two bass-drum components — you can pick a transposed snare head and tom tom body, perhaps with some downward-sweeping auto-pitch-bend for good measure. As well as the 'separated' drums (typically bass, snare and toms), there are a number of full samples of other instruments, from hi-hats and cymbals to latin voices, with a few synthesizer waveforms thrown in too. To be honest, little of the raw material is remarkable in itself, but with experimentation it's possible to create some unique sounds with the S3.

An S3 drum kit contains 16 percussion instruments, which may be allocated to a single MIDI note, spread over a range of notes, or may even overlap. The two timbres of a drum voice each resemble a mini-synthesizer, with their own waveform, 8-stage envelope, velocity response, output routings, auto-bend, tune and transposition. In fact, the only thing missing is a VCF, but the S3 was spawned in that particularly dark period of history when ▶

Korg had mislaid the magic formula for the resonant filter.

Each waveform may be played normally or in reverse, to further extend the S3's sonic palette. By setting appropriate velocity responses, you can switch between or layer any two samples, for a respectable semblance of acoustic feel. If this isn't enough for you, there's a 14-entry modulation matrix with such sources as pitch-bend, modulation wheel, aftertouch, note number and velocity, which can effect pitch, output level, auto-bend (amount and speed) and several stages of the amplitude envelope too. There's one thing to beware of, though: if you edit a timbre you have no way of knowing whether it's referenced in multiple drum kits; innocently altering one of the user percussion patches can quite easily transform that killer kick transient in drum kit 5 into a rather cheesy cowbell! It's the age-old, frustrating problem which haunts many synthesizers, and I've learned to make complete and regular SysEx dumps of my S3's data, to get around it.

Pads Overlap mode determines whether a pad is polyphonic (decaying sounds overlap new hits) or monophonic (decaying sounds are cut off by new hits). By way of two exclusive instrument 'groups' you can ensure that certain sounds will never play together, as the S3 will not allow sounds from the same group to play at the same time. Typically, you'd disallow instrument combinations that a real drummer couldn't physically play, assigning open and closed hi-hats to one group, and rimshot and snare to the other, for example. Finally, the S3 allows you to prioritise certain pads in a kit, by defining them in the reserve group. If you never want a cymbal splash to be cut off by a tom roll, this is how you could do it.

"The S3 takes a rather novel approach to its drum sounds, by splitting many of them into two: the initial hit (drum head) and the decay or body (drum shell)."

EFFECTS

The onboard effects were praised in reviews at the time as a great innovation for a drum machine. Sixteen onboard effect patches, each containing two effects in two configurations, allow some pretty flexible routings. There are 28 effects to choose from, including stereo reverbs, chorus, flanger, delay, exciter and EQ. A range of compound effects, such as delay/reverb, delay/chorus, and EQ/flanger, means that you can vary the processing of up to four individual instruments in a kit if you need to. You can even process the two components of a single drum voice separately. With such flexibility, it's a shame that the effects aren't more impressive — the reverbs are nowhere near as lush and warm as on, say the M1 (one of my all-time favourite reverbs). Nonetheless, they are usable.

Another downer is that the output level is so low that EQ must be set to maximum on both effect slots just to ensure a decent signal! This rather robs you of the ability to make subtle timbral adjustments onboard, and usually means that at least one of the available effect slots is occupied by the exciter (which is only mildly exciting, but better than nothing).

SEQUENCER

The S3 can operate as an 8-track sequencer, with each track playing internal or external instruments, or both. Tracks may be allocated to either (or, again, both) of the MIDI outputs and may be delayed by up to a quarter-note against other tracks. The maximum sequencer polyphony is 32 simultaneous notes.

As you'd expect, recording can be in real or step time, and the usual method of assembling short patterns, then chaining them together to form songs, works well enough. I wouldn't want this to be my main sequencer but for tapping out drum patterns it's certainly adequate, especially when some of the real-time frills are employed — rolls (with their user-defined rate) and flams are ideal for perking up a flaccid performance.

"The S3 was sadly miscast as one of those do-everything instruments that you just *know* won't."

In song mode, the S3 can be used to lay down a timing track to tape, and can sync to this SMPTE signal for song playback. Frame rates available are 30, 29.97, 25 and 24 frames per second, with a programmable song start time.

On paper, the S3 seems quite well tooled up on the sequencing front, with the usual copy, insert and delete functions, plus velocity transpose, pitch transpose, velocity compress/expand, quantise and swing operations. Sadly, these make permanent changes to the data and thus discourage use. Had Korg included an Undo function, it would have made a world of difference.

CONCLUSION

If you buy an S3 these days, it's likely to be for its sounds. Just possibly, you might use its SMPTE features (I confess I never have), but I can't see anyone making more than superficial use of its sequencer. I don't subscribe to the 'everything-in-one-box' approach to hi-fi, and I don't think it works for musical instruments either.

What Korg produced with the S3 was a complex, fiddly device (the manual contains four pages of possible error messages — a clue to just how complex this beast is) which nevertheless can be coaxed into producing a broad spectrum of usable sounds. It's not the drum machine to choose if you want a bunch of familiar dance sounds (the Roland DR660 might be a better all-rounder) or indeed a simple rock kit (the Alesis SR16 seems to have this market cornered).

So why do I like it? I guess because I'm starting to find that older, rather quirky gear can have value because it leads you in new directions. Sometimes it's better to buy a cheap second-hand instrument that was once top of its tree than something new that stretches your budget today. With the rate of discount of new instruments, the chances are that any old S3 you pick up can be passed on again with little or no loss. The S3 may frustrate you and it may never give you that perfect 909 bass drum, but spend a little time programming and its charms start to shine through. SOS

ADDITIONAL SOUNDS

Two PCM slots are provided, each accessing up to 40 new waveforms, and there's also a data card slot for new drum kits and sequence data. Samples from either PCM slot can be accessed when creating your own drum sounds, so your own kits can be made up of waveforms from internal memory or from either of the cards. I have the Jazz set and the Dance set, which gives me over 70 new raw samples to work with. The Dance set is the one that most people seek, and it *is* pretty good, with some nice electro snares and analogue toms, plus assorted hits and scratches. I prefer the Jazz kit, featuring various drums played with brushes.

Korg made other cards too, including the 'Instruments' card, which featured basses, saxes, guitars, and so on.

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RECORDING

AKAI DR4VR, £400; Casio FZ1, £400; SPL Vitaliser, £250; LA Audio 4x4 comp/gate, £200; Boss SE50 multi-effects, £175; Peavey Parametric, £100; Function Junction 16x MIDI, £150; PPS100 sync, £75. ☎ 01732 361442 (Kent)

AKAI MG614, 5-track portastudio (4 tracks + sync), superb mixer with channel inserts and XLR inputs, minimal use, one careful owner, £400. ☎ 01491 824886 (Oxford)

AKAI MG1212 12-track recorder/mixer, £900; dbx 158 modular 8-channel, £250; dbx 154, £75; Lexicon LXP15, £395; LXP1, £175; M79 replay head wanted, also 2-inch tape. ☎ 0114 266 2900

ALESIS ADAT XT, boxed with tapes, hardly used, immaculate condition, £1800. ☎ 01925 740335 (evenings)

ALESIS BRC for ADAT, as new, £580; ADAT v4.2, low hours use, £950 or £1430 for both together, will deliver anywhere in country, cash on delivery. ☎ Robin 01992 575706 (Essex)

ALESIS 16:2:2 mixers, 2 available in excellent condition, home use only, £250 each ono; Yamaha NS40M speakers, home use only, mint condition, £350 ono. ☎ Eugin 0171 753 1861 (day)

ALICE 12:4:8 studio mixer, 8 VU meters, sync/foldback, Tasacam 38 half-inch 8-track, Revox B77, 15/7.5 ips, MXR stereo limiter/compressor, leads, tapes, manuals, all unblemished, one owner, light home-use only, offers. ☎ 0181 688 2211 (Croydon, Surrey)

ALLEN & HEATH GS3 mixer, 16:8:16, MIDI muting, good condition, £800, or part exchange PC or WHY?. Used Ampex half-inch 456 and 499 10-inch spools of tape, £10 and £15. ☎ Jim 01746 862222 (Shropshire)

ALLEN & HEATH GS1 mixer, compact, 32:8:2, perfect condition, little used, including meter bridge, P.U, manuals, box, £600 ono. ☎ John 0121 454 1103 (Birmingham)

ALLEN & HEATH S2, 16:8:2 mixer with MIDI muting, in very good condition, £849 ono. ☎ 0467 637725 (Glasgow)

ALLEN & HEATH 24:8:2 System 8 desk with Penny & Giles faders, Tascam 38, recent service, with tilt trolley and Bell 8-channel dbx, £1800 ono. ☎ 01929 556224 (Dorset)

BANTAM PATCHBAY, 96-way, mint condition, full and half normalising with manual and some multicore thrown in, £190. ☎ 01225 852226 (Bath)

BEHRINGER COMPOSER compressor, £150; Ensoniq DP4 processor, £499; Roland D70 Super LA synthesizer, £450; Mackie 1202 VLZ mixing console, £299; Yamaha AN1X, £650; Oberheim SE1, £599. ☎ Simon 0171 731 4004

BELL 8-CHANNEL dbx, excellent NR unit, plus spare channel, £125; Bell dbx stereo unit, as new, £75, or both for £165; Ampex 1-inch NAB metal spools and boxes, cost £19 each, offers; Art Multiverb digital effects processor, as new, £100; Raindirk Audio 16-channel tape machine interface, matches 10dB outputs from the mixer to +4dB inputs on the tape machine or vice-versa, range +/- 12dB, £125 ono; Proverb 200 16-bit, 19-inch rack unit, 200 true stereo effects, MIDI-programmable patch changes, footswitch input, extremely quiet, excellent condition, as new, £100. ☎ 01202 681419/773103 (Dorset)

CASIO DAR10B DAT recorder, portable, boxed, with case, £275 ono. ☎ Carl 01203 394737 (Midlands)

DIGITECH VOCALIST Workstation, mint condition, boxed with manual, £495. ☎ Andy 01992 560341

DIGITECH VOCALIST 2, rackmount, as new, £300 plus £10 for carriage; Yamaha PSR420, General MIDI, full-size, touch sensitive, £170; Atari 1040STF, needs monitor or TV with SCART, £50; Casio CZ1, £200 (buyer collects). ☎ Robin 01305 785675 (Dorset)

DMR12, 44:24:12:2 mixing desk for sale, offers around £800 considered. ☎ Nick 0171 371 0846

DOD GRAPHIC EQ, 2 rows of 15, mint condition, six months old, bought new, £170 ono. ☎ Ivan 0181 361 3544

ENSONIQ DP/4, four processors in one box, excellent quality, near-mint condition, £775; Mackie CR1604 15-channel mixer, home use only, very good condition, £500, both boxed with manuals. ☎ Steve 01403 268292 (Horsham)

FOSTEX A8 8-track reel-to-reel, good condition, £450. ☎ Darren 01455 8461171/843203 (Leicester)

FOSTEX B16, much-loved classic analogue recorder, £999; Korg M1, £500 ono. ☎ Marcus 01242 699000

FOSTEX DMT8 v2 digital hard disk recorder and mixer with full EQ, 40 minutes of non-compressed 8-track recording, manual and box, excellent condition, £1000. ☎ Sam 01908 681627 (Milton Keynes)

FOSTEX DMT8VL, £750; Boss SX700, £280; Alesis SR16 drum machine, £160; Electrovoice microphone, £90; all boxed with manuals. ☎ Ben 01753 869400 (evenings)

FOSTEX 812 12-channel mixing console, 8 groups, 3 aux sends, boxed, manual, good condition; Mac Powerbook 160 with Cubase, offers. ☎ Chris 01273 323683 (East Sussex)

FOSTEX E16 16-track, £1000; Roland TB303, £750; Korg O1WFD, £750; Casio FZ10M sampler, 300 disks, £400. ☎ 0181 905 5917

FOSTEX E16 multitrack, two 16-way looms and tapes, excellent reproduction, £1200; Casio CZ101 with PSU, manuals, £85. ☎ Steve 01525 373326 (Beds)

FOSTEX E16 tape recorder, boxed, as new, hardly used, £1300 ono. ☎ Dave 01285 713691 (Fairford)

FOSTEX G16 with remote, £1500; Zoom reverb, £70; Peavey Addverb II, £95; Emu Planet Phatt, new boxed, £550; Roland Vintage module, £180; Roland MC500 Mkll, £295. ☎ 01253 404848 (Blackpool)

FOSTEX G24S with sync card, remote extension, hardly used, immaculate, £3500; Soundtracs MRX 34:8:16:12 with Bantam patchbay, looms, stand, cover, home use only, £2500. ☎ 0171 916 2724

FOSTEX M80 8-track recorder, includes rackmount ears, £395; PPS1 Synchroniser, £70, syncs tape to MTC MIDI-clock, or £450 for both. ☎ Mike 01730 266078

FOSTEX R8 8-track reel-to-reel with Seck 12:8:2, wiring loom, good working order, hardly used, offers. ☎ Alan 01243 775312/01903 266156 (Sussex)

FOSTEX R8, remote cable, rack kit, £650, Fostex 812, £425, Ensoniq SD1, £695, Roland R8, £295; AKG C3000, £195, all immaculate. ☎ 01295 721696 (Oxfordshire)

FOSTEX R8 multi-track recorder complete with 5 15-minute reels, excellent condition, £450. ☎ Barnaby 0181 299 9800

FOSTEX 280 4-track, high-speed, Dolby C, full EQ, 8 inputs, case, in very good condition, £320. ☎ 0116 254 8427 (Leicester)

GRAFF DIAMOND duplication system for audio cassettes, 2 master units, 1 power distribution unit, 11 slaves, £3500 ono or split. ☎ 01280 702140

HHB PDR1000 DAT, 4 motors, 2 phantom mic inputs, limiter, filter, perfect condition, hardly used, cost £3500, selling for £1400. ☎ 0181 678 9634

HOME STUDIO CLEAROUT various items for sale including synths, outboard, small modular synth, please call for details and prices. ☎ 0117 985 9420 (Bristol)

LESLIE ROTARY SPEAKER cabinet, awsome power and tone generation, HL822, 6-way EQ, 46 x 26 x 21 inches, on castors, with handles, mint in black and silver, all leads included. ☎ Jon 01297 489259 (Dorset)

LEXICON LXP1 effects, £250; Lexicon LXP5, five multi-effects, £250; Drawmer DS301, MIDI noise gate, mint condition, 2 for sale, £300; Zoom 9030 advanced instrument processor, 9 effects at once, £300. ☎ 01535 645233

LEXICON LXP1 reverb/effects, 2 units, very high quality, immaculate, £275 each; Lexicon MRC remote control for most Lexicons and MIDI equipment, controls 5 units simultaneously, immaculate, £275; Ampex 2-inch, 456 Grand Master tape on 10.5-inch metal spools, used once, as a back-up copies, £45 each; Webber 2-inch alignment test tape, hardly used, boxed, £85. ☎ 01482 448767 (Hull)

MACKIE CR1604, NOT VLZ but still fine! 16 inputs, two stereo outs, six auxiliary sends, great mic preamps, phantom power, rack mounting ears, Rotopod, flexible desk, £600. ☎ 01354 695239

MACKIE CR1604, just been serviced, with papers to prove it, as good as new, very clean desk, will arrange delivery, £600 ono. ☎ 01223 771636 (Cambridge)

MACKIE CR1604 VC2, Rotopod, £700. ☎ 0181 813 9970

MACKIE 8 BUSS 24-channel mixer plus 2 Fostex D80s, all boxed, nearly new, including looms to make an excellent 16-track digital studio, £3000. ☎ 01753 620342 (Berks)

MACKIE 24:8 console, in very good condition, £1950 ono; Microtech UM92S valve microphone, as new, £1345; Sony U-matic VP5030 player, multi-standard, low hours, £200; Two SKB 16U suspension racks, £245 each (RRP £500) and one 12U rack in good condition, £225 (RRP £479); Flight trunk with hinged lid and locking wheels, 1.2m long by 60cm wide by 60cm deep, in very good condition, £200. ☎ 0181 875 9712

MACKIE 32-CHANNEL desk with meter bridge, stand, £3500 ono. ☎ 01628 771710 (Maidenhead)

OKTAVA MK219 condenser mic, black finish and case, £140. ☎ Jon 01342 825158 (Sussex)

OTARI MX5050 half-inch 8-track with remote transport controls and 6 point autolocation, £400; Studiomaster 16:8:16 Mixdown, full EQ and 6 aux channels, £350. ☎ Lawrence 01525 221106 (Luton)

PATCHBAYS, a 48 quarter-inch-jack 1U rack, £40; and a 120 quarter-inch-jack 5U rack, £60. ☎ 0181 296 8820 (Kingston)

PIONEER PDR05 CDR recorder, mint condition, hardly used, £450; Reno CD-ROM player, mains/portable, mint, £75; Conner 540Mb hard drive plus Akai S3000XL fitting kit, £75. ☎ Nigel 01361 890279 (Berwickshire)

RANE FMi 14 10-channel mixer (extendable), including FMM42 master module, FLM82 line mixer, FPE13 parametric EQ, RAP10 power supply, FHL2 link kit, £999; studio table with rack-mounting facilities, £290; Fostex line amplifier, 5030, £150; Klotz 16P studiocore, 7m, Plugs D64-E24T, £50. ☎ 01733 347484 (Peterborough)

REVOX A77 HS, 15/7.5 ips reel-to-reel with manual, £200; dbx type 1 professional noise reduction unit for above, £50. ☎ Ian 0118 961 3002 (Reading)

REVOX C278 8-track recorder, Allen & Heath S3 mixer, 16:4 mute automation, Behringer 8-track de-noiser and Ultrafex; Yamaha FX900 and ART LX effects. ☎ Kevin 0958 737880 (Dorset)

RODE NT2 microphone, £350; NT1, £190; both as new, AKG D202, £150. ☎ 01749 673464 (Somerset)

ROLAND VS880 digital studio workstation with dual effects board, 1.2Gb external hard drive, all manuals, box, mint condition, hardly used, £1350. ☎ Robert 0117 949 6058

ROLAND VS880 8-track recording system, as new with box, manuals, cost £1599, will sell for £1299. ☎ Mike 01592 640877 (Fife)

ROLAND VS880, 8-track recorder with effects board and 1Gb Seagate external hard drive, boxed, £1170 ono; Alesis stereo compressor 3630, boxed, £130. ☎ Kalim 01274 780263

ROLAND VS880, expanded, including drive, effects board, boxed, as new, £1300; Yamaha RM50 drum sample player, 6 triggers, 8 audio outs and sound card, as new, boxed, £350. ☎ Kevin 01277 364931 (Ongar)

SAMSON PA SYSTEM, including power amp, Servo 550, 2x275w, mixing desk, MPL1640, 16 channel, 3 aux, 4 buss, rackmount, brand new, Samson 2-year warranty, EMS 6U flightcase, £900 ono, or sold separately. ☎ George 0181 933 3248 (Ealing)

SANSUI MR66 6-track cassette recorder, double speed, Dolby B, sync input, box, manual, recent Panic service, 50% more tracks than your average cassette multitrack, £365. ☎ 01354 695239

SECK 12:8:2 mixing desk, 3-band EQ, mid-sweep, 2 aux sends, mic/line input, £300; Washburn AB25 electro-acoustic, 5-string bass, never gigged, £300. ☎ 0121 359 5702 (Birmingham)

SELLING COMPLETE STUDIO, contents include mixers, hard disk recording, samplers, all pro gear at good prices, call for a bargain. ☎ 0181 985 7941

SENNHEISER MKH40 microphone, as new, with case, £495; Shure Unidyne B, £25; Shure Unishere B, £25. ☎ 01724 720937/01652 640088 (home/office)

SHURE BETA 58 microphones, 3 of them, plus Beta 57, each with Klotz cable and Neutrik balanced connectors, all unused, £200; Studiomaster Diamond Pro 8:3 mixing desk in full flightcase, £100; Alesis Microverb 3, never used, £50; Yamaha MT50 4-track recorder in original box, £50; 4 Beyerdynamic mic stands, plus 3 PA speaker stands, SKB full flightcase, £100; Sony MDR-IF210 cordless headphones, £20; Westone Thunder I-A electric guitar in Hiscox Liteflite case, £100; Tanglewood Chicago semi-acoustic, £250; Yamaha FG411C electro-acoustic, £150. ☎ 01665 510214

SONY TCD D7 portable DAT recorder/player, Sony ECM stereo mic and I/O cable included, £400. ☎ Alan 01442 878370 (Herts)

SOUNDCRAFT DELTA, 16:4:2 mixing desk, 24 inputs (16 mic/line), deluxe model, professional desk, in excellent condition with case, £1400 + VAT (private sale); Klark Technics DM300, 31-band graphic, excellent condition, £380 +VAT (private sale). ☎ 01773 823805 (Derbyshire)

SOUNDCRAFT K2, mixer, 24:8:2, MIDI muting, excellent live mixer, 4-way matrix, flightcased, mini lamps, two linked, £3500. ☎ Jools 0181 964 4623

SOUNDTRACS DESK, 16:8:2, £600; Yamaha SPX90, £150; Art Multiverb, £150; Alesis Quadraverb, £150; Kawai EQ 312G Dual Graphic, £250; Alesis MEQ 230 Graphic, £100; Atari Falcon Digital 8-out, £400; Cubase Audio, Monitor, Mouse, PC Keyboard, Aphex Aural Exciter Type C, £85; SPL Vitalizer, Model SX2, £300; Alesis 3630 noise gate & comp, £100; Sony reel-to-reel, NAB, £100; Dolby stereo, £50; £2000 for the lot. ☎ Stash 01225 313219 www.weblinkuk.com

SOUNDTRACS MEGAS mixing Desk, 20:16:16 with MIDI muting, 6 aux sends, 4-band switchable EQ, £1000 ono. ☎ James 01223 721776 (Cambridge)

SOUNDTRACS SOLO LOGIC 32-channel automated desk, as new, £3600. ☎ 01273 707777/0966 475616

SPIRIT FOLIO 12:2 mixer, excellent condition, original box, instructions, PSU, £199; Behringer Composer, versatile compressor, original box, manual, as new, £120. ☎ 0118 975 2036 (Reading)

SPIRIT FOLIO SI MIXER, 18 channels, 2 aux sends, 3-band EQ, swept mid on two channels, rack mounting, excellent condition, £250. ☎ Paul 01256 471258 (Basingstoke)

STUDIOMASTER DIAMOND Club 16:2 mixing desk, 2 aux, 3-band EQ, mic and line inputs, perfect condition, £240; Roland TR707, £120; Roland TR606, £110, both in perfect condition. ☎ Nic 0181 361 3544

STUDIOMASTER MIXDOWN GOLD, 16:8:16:2, 34 inputs on mixdown, MIDI mutes, case, manual, mint condition, offers; Atari STE, 4Mb, monitor, Midex+ Cubase v3.02, Export, dongle, manual, Roland A880, MIDI patchbay, 8-ins 8-outs, Merge, filter. ☎ Mike 0161 7409438 (Manchester)

STUDIOMASTER PRO-LINE mixing console, 24:8:16, one owner from new, home studio use only, manual and quality dust cover, cost over £2000, will sell at £650. ☎ Jonathan 01924 381374 (Wakefield)

STUDIOMASTER SERIES 3 modular mixing console, 37:8:2, 6 aux sends, flexible EQ, with two sweepable bass/mid EQs, solid build, great quality, mint condition, £800; Lexicon LXP1, £240; dbx 163 compressor, £80; Drawmer DS201 dual gate, £240; Drawmer LX20, £140; Akai parametric EQ, £80; Aphex Type C exciter, £80; Boss REC10 chorus, £80. ☎ Matt 0966 268564 (Nottingham)

STUDIOMASTER SERIES 5, 16:8:2 mixdown, manual, exellent condition, £650. ☎ Spencer 01795 537068 (Faversham, Kent)

STUDIOMASTER STELLARMIX, 12:8:2 mixer, very good condition, £390 ono. ☎ 01634 671086 (Kent)

TASCAM MM1 20:2 mixer with MIDI mute automation, 4 auxiliaries, 2-band EQ, perfect submixer. ☎ Greg 0468 762908 (Nottingham)

TASCAM M208, 8:4:2 mixer, in good condition, £200; Mackie CR1604 mixer, Keith Salmon, Flat 1 GFF, 26 Nightingale Road, Southsea, Hants, PO5 3JL

TASCAM 38, 2 dbx units, six tape reels, Philip Rees Synchroniser, Atari 1Mb computer and monitor, Emagic Creator, £1300 ono; Alesis SR16 drum module, £140 ono. ☎ Mitch 0121 551 2079 (Birmingham)

TASCAM 464, boxed, manual, inserts, sweep EQ, rehearsal and punch-in modes, £350; Zoom 9030 effects, full MIDI, preamp, nine effects at once, £200. ☎ Steve 01737 557050

TASCAM 238S 8-track with flightcase, £700; Gina, 2-in, 8-out, with digital I/O, PCI card, £450; Cubase VST 3.5 PC, £250. ☎ 01569 731448 (Aberdeenshire)

TASCAM 644 MIDIStudio, mint condition, boxed, with manuals, very good for home use, from a Pro Studio, £595; Novation DrumStation, brand new, boxed with manuals, £399. ☎ 01225 852226 (Bath)

TASCAM MIDISTUDIO 644 4-track with 16-channel mixer, matrix routing, sync and MIDI mute, home use only, with spare tapes, £360. ☎ 01705 690842 (Portsmouth)

TASCAM PORTA 05, Alesis SR16, Alesis Datadisk, Roland Sound Module, Atari 520STE, 1Mb, £750. ☎ 01472 827951 (Grimsby)

TASCAM 688 MIDIStudio, £650; Roland 301 chorus/echo, £150; HH tape echo, £50. ☎ Dave 01482 565163

TEAC A3340S multi-channel tape deck, 4-track, 8 inputs, 10.5-inch NAB reels, original manuals, virtually unused, pristine condition, with JVC 4-channel headphones and extra tapes, £275 ono. ☎ KC 0973 548306 (Leeds)

TECHNICS SVDA10 DAT, unwanted gift, optical I/O and SPDIF, shuttle wheel, pro quality and build, as new, £450, no offers. ☎ 0161 445 5677 (Manchester)

TOA MIXER with flightcase, excellent condition, quick sale needed, £300; Stereographic EQ, £99; HH stereo electronic crossover, £75. ☎ Simon 01252 795100

TL AUDIO CRIMSON 3051 mono voice processor mic, preamp with compressor and 4-band EQ, excellent for vocals and guitars, £200 ono. ☎ Simon 01274 662262/01274 546660

VESTAFIRE SL020, dual compressor/limiter, 1U rack space, excellent condition, boxed with manual, £130 ono. ☎ 01633 613342 (Newport)

YAMAHA MD4, 4-track minidisk recorder, only four weeks use, £570 ono; Fender Hybrid Telecaster, home use only, £500 new, sell for £300. ☎ 01225 834237 (Bath)

YAMAHA M1500, PA mixer/amp, 150W, 6-channel, 2x100w speakers with case. ☎ 01438 220536 (Herts)

YAMAHA MT3 4-track recorder, mint condition, for sale or swap for Novation BassStation, or any other outboard gear, £200 ono. ☎ Alex 0151 513 1106 (Merseyside)

YAMAHA MT50, 4-track, boxed, manuals, very little use, good condition, £199 ono. ☎ Steve 0181 682 2885

YAMAHA MT100 4-track, dbx, varispeed, aux, individual tape outs, boxed, with manual, £200; Boss CS3 compressor £40. ☎ Bruce 01935 425932 (Somerset)

YAMAHA PROMIX 01 digital mixer, excellent condition, as new, boxed, manual, £950 ono. ☎ 0181 549 8677 (Kingston)

YAMAHA S100 nearfield monitors, suitable for small project studios, £100 ono; Carlsboro Beta 112, PA speakers, £300 ono. ☎ Jeff 01455 636900 (Devon)

SEQUENCERS

ROLAND MC303 Groovebox, as new, hardly used, £325. ☎ Steve 01732 872101

ROLAND MC303, mint condition, unwanted prize, boxed with manuals, £450 or possible swap for Novation BassStation. ☎ James 01603 477761 (Norwich)

ROLAND MC303 Groovebox, boxed with manuals, hardly used, home use only, £400. ☎ Ricardo 0410 2894167 (London)

ROLAND TB303, excellent condition, box, carry-case, manual, sync converter, £800 ono. ☎ 0181 883 4598

ROLAND TB303 in top condition, as new, £1000. ☎ +43 1 4199543

ROLAND TB303, immaculate condition, with case, £900. ☎ Rob 01323 647813

ROLAND TB303 in very good condition, £600 ono; Roland TR808 drum machine in very good condition, £450 ono. ☎ 0113 289 9622 (Leeds)

YAMAHA QX5, sequencer with floppy drive, £150 ono. ☎ 01246 291106 (Chesterfield)

YAMAHA QY10, compact sequencer/module, in perfect condition with original case and manual, £100. ☎ Russ 01724 847152 (Scunthorpe)

YAMAHA QY700 sequencer, mint condition, hardly used, boxed, with manuals, £799. ☎ Andy 01992 560341 (Essex)

SAMPLERS

AKAI CD3000XL sampler, v2.0, 24Mb, effects board fitted, CD-ROMs, disks, still boxed, never used, £1575; Kawai MDK 61 II master keyboard, boxed as new, £140. ☎ Paul 01536 761014 (Northants)

AKAI S01, £225; Yamaha A3000 output board, £100; Alesis Midiverb 3, £80; Midiman Syncman SMPTE box, £60; Philip Rees 3M MIDI Merge, £30; Laney PA100, £15. ☎ Darryl 01932 340473 (Surrey)

AKAI S900, new software v2.2, 8 outputs, 30 or more disks, £300. ☎ George 01708 554972 (evenings)

AKAI S950, fully expanded, boxed, as new, £500; Korg 03R/W (rackmount 01/W), boxed, as new, £500. ☎ Mark 01386 422832 (evenings)

AKAI S950, expanded, £475; Atari, monitor, £150; JD800, £750; JV1000, £800; DR4d, hard drive, £600; Casio FZ1, £280; A-frame, £50; Korg 01/W, £490. ☎ 01252 377638 (Hants)

AKAI S950 sampler, £450; Behringer Eurodesk MX8000, £900; Atari 1040 STFM with high-res monitor, £90; Korg 01/W, £300. ☎ Pete 01329 845643 (evening)

AKAI S1000, SCSI board fitted, 8Mb RAM, immaculate condition, boxed, manuals, 4.4 software, Zip drive and lead, £1000; Mackie 1604 with Rotopod, £550. ☎ 01268 452028 (Essex)

AKAI S1000, sampler, 10Mb memory expansion, copy of manual, disk, good condition, £800. ☎ 0114 250 8699 (Sheffield)

AKAI S1000 hard disk sampler, internal hard disk digital AES/EBU fitted, optical, SCSI, 20Mb memory, home studio use only, £999. ☎ Jonathan 01924 381374 (Wakefield)

AKAI S1000HD, 10Mb hard drive, v4.3 operating system, SCSI, home use only, excellent condition, £750 for quick sale. ☎ Kevin 0171 226 8297

AKAI S1100GX, superb condition, will exchange for different sampler or sell for £500 ono; Roland TR626, £100 ono; MSQ700 sequencer, £100 ono, or everything for a good offer. ☎ 01904 784552 (York)

AKAI S3000XL, £1000; Korg Wavestation SR, £350; Roland SH101, £300; Juno 60, £250; Emu Vintage keys+, £375; S1000 keyboard, £650; Alesis compressor, £150; Moog Prodigy,

£220, Akai ME80P, £100. ☎ 01206 792123 (Colchester)

CASIO FZ1 digital sampling keyboard, large library and MIDI leads, £400, Yamaha AM802 8 2 mixer with 3 aux inputs, £170, Computer and keyboard desk, £80. ☎ 01935 427658

CASIO FZ1 sampler, 8 outputs, resonant filters, large LCD display for waveforms, over 150 disks, manual, £300, Yamaha TG33 vector synth, £150. ☎ Simon 0161 860 6139 (Manchester)

CASIO FZ1 2Mb sampler keyboard, 8 outputs, large LCD display, manual, £325 or swap for rackmount sound module/effects. ☎ 01483 423088 (Surrey)

EMU IIIXP, 32Mb RAM, SCSI, 4 Stereo outs, digital I/O. £1200 or best offer, Akai S1100 expanded sampler, in excellent condition, 12Mb RAM and all cards, SCSI, SMPTE for video or multitrack sync, and digital I/O, £1250 or offers. ☎ +34 1 652 03 19 (Madrid, Spain) or email josue@wnteme.com

EMU EMULATOR E4K keyboard sampler, 64Mb chip allows full expansion, 540Mb hard drive, EOS 3 sequencer, huge library, effects, ASCII keyboard, boxed, mint, £2460 ono ☎Andy 01291 430704 (Gwent)

EMU E4X, 64Mb, effects, 540Mb hard drive, still guaranteed, £2222, Kurzweil Micro Piano, £250. ☎ 0117 914 4752 (Bristol)

EMU ESI32 sampler, only six months old, boxed, manuals, excellent condition, can deliver in south, £699. ☎ Anthony 0966 455761 (Horsham)

EMU ESI4000 Turbo, 64-note polyphony, effects, 10 outputs, digital in/out, resonant filters, only one month old, cost £1499, yours for only £1250. ☎ Richard 0171 288 0128

ENSONIQ ASR10 keyboard, 8Mb, 24-bit effects, hard disk recording, sequencer, boxed, excellent condition, £1000, Atari STE, 2Mb, Cubase, brand new monitor, boxed, £200. ☎ John 01482 888893/0956 602470 (Hull)

ENSONIQ ASR10, keyboard sampling workstation, in very good condition, disks, manuals, £700, Roland JV80 keyboard, good condition, footpedal, manual, £325, Beyer DT250 studio headphones, mint, boxed, £50. ☎ 01244 376446 (Chester)

ENSONIQ EPS sampling keyboard, Moog, Roland library, £320. ☎ 0839 840933 (Brixton)

ENSONIQ EPS16+, £520; Oberheim Matrix 1000, £250; Yamaha TG33, £170; Boss DR660, £170; Crumar Spirit analogue (Moog designed), £150; Atari STE, monitor, £165, all immaculate with manuals. ☎ David 0181 880 2046

ENSONIQ EPS sampler, 8-output expander, hard carry-case, in very good condition, £450. ☎ David 01483 830621 (Guildford)

KORG DSS1 sampler, weighted keyboard, 100 factory disks, editing software, MIDI £250, Yamaha RX5 drum machine, £125, Yamaha R100 reverb, £65, Yamaha EMT10 sound expander, £65, all with manuals. ☎ 01525 221106 (Luton)

ROLAND DJ70 MK I sampler, basic 2Mb fitted as new, original packing, manual, £525 ono. ☎ Nick 01275 462762

ROLAND MS1 stereo sampler, 4Mb RAM card for long sampling times, manual, boxed, easy to use, £260; Tascam M144 4-track Portastudio with manual, in need of repair (transport problems) hence £60, Alesis Microlimiter/compressor, £60. ☎ 01933 678608 (Northants)

ROLAND S750 sampler, turbo memory board, colour monitor, mouse, latest system, excellent condition, £1200; Roland JV1080, £595. ☎ 0161 440 8759 (Cheshire)

ROLAND S760, 10Mb, superior filters, manual, disk upgrade, immaculate, £850. ☎ Jon 01394 274511/ 670622 (days/evening)

ROLAND S760, 32Mb, CD-ROM drive, SyQuest removable drive, loads of library on CD-ROM, £1400; Korg Wavestation SR, £525; Technics WASIR modelling synth, £600; 414 R2B mic, £400. ☎ 01507 463182 (Lincs).

ROLAND S760 sampler, 18Mb, with CD-ROM drive and library, £900. ☎ Ian 01132 783690 (Leeds)

ROLAND W30 sampling workstation with Roland sound library, editor and manuals, boxed, home use only, £500. ☎ Adrian Smith 01227 264054 (Kent)

ROLAND W30 workstation sampler and sequencer, excellent condition, boxed with manual, £510; Korg Poly 800 MkII synth, £120. ☎ Mark 0113 274 8092 (Leeds)

ROLAND W30 with disks and manuals, £520 ono, Korg X3 workstation, home use only, boxed, manuals, quick sale, £650 ono or £1100 for the pair. ☎ 01203 559080 (Coventry)

SEQUENTIAL PROPHET 2000, filters, arpeggiator, needs new disk drive, £300; Akai S950 full expansion, £475; Chase Bit 99, £200; Roland D50, mint, £375; Casio CZ1, mint, £225, Yamaha DX7, £200 H&H stereo desk, £100, part-exchange for JP8000, JD800, D550, PG1000, A3000, Rave-O-Lution, AN1X, SE70, Launch Pad or Studio Quad. ☎ 01902 744293 (Wolverhampton)

YAMAHA A3000, internal SCSI, 10 inputs, expanded, 2 months old, £1000 ono, Sony DAT, SSES optical interface, regularly serviced, mint condition, £250 ono; Casio CZ5000, classic full-size keyboard, manuals, low noise, built-in sequencer, £150 ono; Yamaha SPX900 multi-effects unit, superb condition, £300. ☎ Mark 0121 520 6132 (Telford)

DRUM MACHINES

AKAI MPC2000 sampling drum machine, sequencer, brand-new, boxed with manuals, £775; JL Cooper Datamaster sync for ADATs, SMPTE/MIDI timecode, cost over £600, sell for £150. ☎ 01224 713334 (Aberdeen)

ALESIS SR16 drum machine, £110. ☎ 0171 609 6478

BOSS DR5 rhythm section drumbox/sequencer, boxed with manual, £195; Carlsbro PA212, 2x12-inch mid-horn bullet tweeter per cab, 150w, 8-ohm, £190. ☎ Graham 01634 580756 (Kent)

BOSS DR660, boxed, manuals, mint, £200. ☎ Dan 0171 277 4707

EMU PROCUSSION drum module, excellent condition, very versatile machine, £300 ono, Yamaha TG77, very good condition with editor and library, £425 ono. ☎ Jason 01422 846300

KAWAI R100 drum machine and chip, £125 ono; Korg KPR77 analogue, £80 ono; Korg DRM1, 5 cards, £140 ono; Yamaha FB01, £60; Microverb II, £65; Wanted: Korg M1 cards, Kawai K4 cards and manual or photocopy. ☎ 0121 662 2743

KORG S3 rhythm workstation, boxed with manual, £180. ☎ Eddie 01482 897307

QUASIMIDI RAVE-O-LUTION 309 with output expansion board, boxed with manual, immaculate condition, £650. ☎ Darryl 01932 340473 (Surrey)

ROLAND R8 drum machine with SNR8 04 808 card, manual, in good condition, £300 ono. ☎ Andy 01524 36722 (Lancaster)

ROLAND R8M, rackmounted, 8 outputs, 20 kits, excellent condition, manual, £275 ono, 100w 12-inch PA speakers plus 100w amp, £150. ☎ 0171 267 2966

ROLAND R8 MK 2, box and manual, £450 ono. ☎ 0141 221 7026 (Glasgow)

ROLAND TR808 drum machine, with manual and MIDI retrofit, £500 ono; Roland TB303 Bassline, with carry case and manual, £700 ono. ☎ 0161 286 9709 (Manchester)

SIMMONS SDX, 8Mb sampling RAM, 70Mb HD, 8 force-sensing resistor pads with128-position detection, kick, hi-hat, rack, offers; Sony DPSM7 modulation effects processor, high quality sound, deep and sophisticated level of programming £490, multi-effects processor equivalent to Quadraverb, £190. ☎ Chris 0336 782 888

YAMAHA RX5 monster drum machine, 12 separate outputs, power supply and 6 RAM-cards, £230 ono. ☎ 01246 854921 (Derbyshire)

PERSONNEL

DRUMMER AND FEMALE singer required to complete dance-indutrial Cambridge outfit, Album to promote major label interest, Soundgarden, Nine Inch Nails. ☎ Tim 01223 367040

FEMALE PROGRAMMER seeks nice inventive programmer for creative trip-hop, pop, orchestral project with dance and guitar influences. ☎ 0171 252 6028

FEMALE SESSION VOCALIST required for Portsmouth-based project studio, demoing mainstream pop/chart music. ☎ Paul 01705 822112 (Portsmouth)

LYRIC WRITER, with a resourceful mind, full of kaleidoscopic imagination, for writing ready/tailor-made verses to harmonise with your music, one-offs or contracts considered, negotiable terms. ☎ Lisa 0181 214 2503

PROFESSIONAL DRUMMER touring in Europe, very good sight reading, looking for paid work, both live and studio. ☎ 0958 769574 (London)

VOCALIST, 45, beautiful, unusual voice, available for pro-recording projects, into samples, guitars, ambience, melodic noise, experimental indie, MBV, Cocteau, Spiritualized, Roses, Stereolab, tape available. ☎ Eddie 0171 263 3919

VOCALIST WANTED by old-fart band in their '30s wanting to gig again, moderate ability with a good voice to raise our game, influences Free, Cream, Weller. ☎ Paul 0113 2393062 (Leeds)

WEST SOMERSET singer/songwriter with studio, seeks writing partner, laid-back ambient trip-hop, trance. ☎ 01984 641247

COMPUTERS/SOFTWARE

APPLE MAC LCIII, 4/80 colour monitor, Stylewriter inkjet printer, MIDI interface, Emagic Logic sequencer, lots more software, £400; Carlsbro Cobra 90 keyboard combo, £100. ☎ Ian 01132 783690 (Leeds)

APPLE MAC 660AV Quadra, Apple 15-inch monitor, keypad, CD software, Steinberg VST, Steinberg Recycle, Opcode OMS, cost £1650. ☎ Tony 0171 354 3087

APPLE MAC QUADRA 650, 24Mb RAM, 230Mb hard drive,14-inch colour monitor and software, Digidesign AudioMedia II audio card with stereo in/out, digital/anologue, Sound Designer II and Cubase Audio 2.0 software, £600 for the lot or swap for sampler, London only ☎ Steve 0181 376 3484

APPLE MAC QUADRA 700, 20/240, Apple 14-inch RGB monitor, 24-bit keyboard, mouse, Apple MIDI interface, D2 CD-ROM, Cubase 2 5, all with disks, manuals and boxes, £700. ☎ 0161 429 7717 (Cheshire)

APPLE QUADRA 800, 32Mb RAM, 230Mb hard drive, CD 300e CD-ROM, Audiomedia II card, Sound Designer and Masterlist software, Logic Audio Discovery 3, 14-inch monitor, £825. ☎ Dave 0115 950 7033 (Nottingham)

ATARI FALCON, 4Mb RAM, 127Mb hard drive, Emagic Logic sequencer, 40 effects, business software, utilities, extra MIDI ports, £425 ono. ☎ 0973 915269 (Staffs)

ATARI HIGH-RES monitors, black and white, suitable for Cubase, latest 14-inch model, in very good condition with box, can send, two units, £75 each; Roland colour monitor, 14-inch, RGB display with special cable, suitable for any Roland sampler, good condition, only £85, can dispatch if required. ☎ 0181 668 6077 (Surrey)

ATARI MEGA 1 computer, Atari high-resolution mono-monitor, immaculate condition, Pro 24 v3 and loads of music software, £150. ☎ Graham 0151 729 0529 (Liverpool)

ATARI MEGA 4 with monitor, printer, all in good condition, lots of extra software, £225 ono, Roland A880, MIDI patchbay, in perfect condition, eight ins/outs, in perfect condition, £150 ono; 14 or 15-inch Mac monitor wanted, must be in good condition, cash waiting for best offer. ☎ Andy 01633 613342 (Newport)

ATARI POWER MAC, 8100/80AV, 16Mb RAM, 500Mb hard drive, CD-ROM, monitor, keyboard, Moviepak video capture card, Videoshop 3, boxed, as new, £600. ☎ Tim 01865 264839/01235 550491. Email timr@grolier.co.uk

ATARI 520STFM, 1Mb, £80; Philips CM8833 colour monitor, £80 or both for £150, includes cables, games, software, joystick. ☎ 01375 401964/0498 570517 (Thurrock, Essex).

ATARI 1040STF, 2Mb, SM124 monitor, CA hard drive, £200. ☎ Chris 0171 327 6813/0181 325 2621 (day/evening)

ATARI 1040 STFM high-res monitor, C-Lab Notator, Creator v3.1, Export, dongle, manual, £350. ☎ 01487 831221

ATARI ST, 2Mb, SM124 monitor, Cubase v3, £300; Emu Emax II, £550; Boss Dr Synth, £150; Zimmer rack, 27U, £50; Peavey XR600 PA head, £300, 2 Carlsbro A212 cabs, £200. ☎ Matt 01926 330135 (Warwickshire)

ATARI STFM, 1Mb, with high-res monitor plus Notator SL3.21 with dongle, manuals, training video, £210; Alesis Nanoverb, £90, Yamaha drum machine, RX11, £80, Audiowerk hard disk recording card with VMR software, break-out cables and manual, 2 in/8 out, plus digital I/O, 6 months old, £375. ☎ 0118 947 0761 (Reading)

ATARI STE, as new, 4Mb, high-res monitor, Unitor 1, software, KAT remote control, export, offers. ☎ Adam 0956 397728

CUBASE SCORE VST for Mac v3.5, as new, complete with installs, CD, manuals, registration form, £300. ☎ 01993 812739 (Oxon)

CUBASE VST SCORE 3.5.2 with 25 of the best plug-ins for Mac. ☎ Dan 01493 330441 (Norfolk)

CUBASE VST 3.5 PC, save £50 on shop price, new, unregistered, complete with dongle & CD-ROM, got two for Christmas, must sell duplicate, £300. ☎ Steve 01569 731448 (Stonehaven, Aberdeenshire)

CUBASE V3.1 FOR ATARI with dongle, manuals, scorewriting, the lot for £120 ono. ☎ Simon 01582 502470 (Luton)

DIGIDESIGN SESSION 8 with 882 I/O for Macintosh, mint, boxed, Micropolis 2.1Gb hard drive, offers, Akai ASQ10 sequencer, mint condition, £450 ono. ☎ 01277 365343 (Essex)

DIGITAL AUDIO LABS Card D+, superior audio card, low noise, cost £600, will accept £300 ono. 0171 281 4619/267 5041 (day/evenings)

EMAGIC AUDIOWERK 8, Logic Audio v3 for Mac, PCI board, latest version software, still boxed, perfect condition, £625. ☎ Alan 01442 878370 (Herts)

EMAGIC AUDIOWERK 8 PCI card, Logic Audio v3, Steinberg Recycle, Rebirth, MOTU Pocket Express, all still boxed, perfect condition, £899. ☎ Alan 01442 878370 (Herts)

EMAGIC LOGIC AUDIO, v3.0 for Mac, still sealed, unwanted prize, £375 ono. ☎ 01223 501106 (Cambridge)

486 DX50, 8Mb RAM, 640Mb hard disk, 16-bit sound card, includes Cakewalk Pro Audio, Cool Edit, Goldwave, 14-inch monitor, keyboard, mouse, printer, £450 ono. ☎ Michael 01505 320714 (Renfrewshire)

MOTU UNYISYN, original disks, manuals, Windows 95/3 ... £95; MOTU MIDI Express, PC, 6 port MIDI interface, boxed as new, £125. ☎ 01384 567727 (daytime)

OPCODE STUDIOVISION for Mac, £150, Pro Tools Bridge I/O, NuBus Card, adds 8 tracks to main system, offers; Sound Tools DAT I/O and AD, offers; Nakamichi PMA 7IIE power amp, very high quality amp, few hours use, cost £1800, sell for £1200 ono; Casio VZ10M phase distortion synth, £190. ☎ Chris 0336 782 888

PENTIUM 166MMX 2.5Gb hard drive, 32Mb RAM, Soundcard, MIDI In/Out ports, Cubase Audio, Rebirth, Wavelab Instant Dance Music Tool, £599. ☎ Mike 01785 840 830 (Stafford)

STEINBERG CUBASE 3.0, never used, £170 ono. ☎ 01382 872085 or email ronnie.a@zetnet.co.uk

STEINBERG CUBASE AUDIO VST, 3.5 for Mac, £275; Terratec Base 1 soundcard for PC, £30; Apple Stylewriter II printer, £30; all ono. ☎ Steve 0181 301 0777 (Kent)

STEINBERG REBIRTH, RB338 techno microcomposer, emulates legendary Roland TB303 and TR808, unwanted gift, quick sale, £70. ☎ Mark 0958 778169 (Dorset)

TURTLE BEACH FIJI with digital I/O, only 7 months old, superb soundcard, very low noise, 20-bit converters, boxed, manual, £220 ono. ☎ Paul 01705 822112 (Hants)

TURTLE BEACH TROPEZ CLASSIC, full Duplex, SampleStore, 4Mb RAM, Windows 95 drivers, cost £250, will sell for £80 ono. ☎ 0411 502305 (Brighton)

YAMAHA CBX HDR system, 19-inch rack, Studio Vision Pro 3 Mac software, £480 or split. ☎ 0181 889 0990/0802 447358

YAMAHA SW60XG PC soundcard, boxed, manuals, £80 ono. ☎ 01246 208659 (Chesterfield)

WANTED

AKAI S3000XL, cash waiting. ☎ 01202 392198 (Dorset)

ALESIS ADAT, Yamaha, Korg or Roland synth or module, PC software and soundcard, cash waiting, have additional gear available for swaps. ☎ 01869 347167 (Oxon)

ATARI FALCON WANTED in good conditon, patchbay also wanted. ☎ Chris 0116 2702716 (Leicester)

ATARI MIDI PORT expander for Cubase, Mega 4, willing to purchase complete setup. ☎ 0114 255 7707 (Sheffield)

CAN ANYBODY out there help? Do you have the pizzicato synth sample found on tracks by Sash, Faithless, Quicksilver, needed on floppy-disk for ESI32, I'm desperate. ☎ Rob 0191 469 4573 (Gateshead)

DIAMOND EDGE defragmentation software for Falcon. ☎ 01702 521570 (Essex)

DIGIDESIGN SOUND TOOLS for Mac or Atari, especially DAT I/O interface, will buy as a package or interface only and will pay well. ☎ 0191 285 7596 (Newcastle)

ELEKTOR FORMAT BOOK wanted, your price paid. ☎ Gary 0151 201 8490 (Merseyside)

EMU EMULATOR 2 wanted, must be working and a reasonable price, for sale: Yamaha C55, £135, Kawai K3, £235, Vesta Kozo MIDI/CV, £35. ☎ Ade 0151 722 2165 (Liverpool)

EMU EMULATOR IV or E6400 & Yamaha VL1m wanted, (will also consider EMU ESI4000). London area preferred. ☎ Darren 0181 441 7441

FENDER RHODES electric piano wanted, built-in speaker, tremolo version. ☎ Richard 0181 654 6052

FOSTEX DCM100 16-channel stereo mixer with EQ and FX sends/returns in a 1U rack, all controllable via MIDI, £150 ono. ☎ Stephen 01603 504461 (Norwich)

FOSTEX DCM100 & MIXTAB mixer rack & control tablet. ☎ Daniel 01732 822824 (Kent)

KEYBOARD wanted, continental chromatic, 5 row style. ☎ 0131 477 9387 (Edinburgh)

KORG M1 PCM cards, especially string sounds. ☎ Norman 01279 814439 (evenings)

KORG MS20 or Oberheim Matrix 1000 wanted. ☎ Dominik 01703 211827 (Southampton)

KORG 700S/ROLAND JUPITER 8, must be in good condition and perfect working order, cash waiting, I'm a musician, not a dealer. ☎ Renato 01628 825959 (Berkshire)

LEXICON JAM-MAN required, must be in good condition, cash waiting. ☎ Paul 0181 398 6523 (Surrey)

ROLAND AX1 keyboard or similar 'shoulder type' keyboard wanted, cash waiting. ☎ 01224 724379 (Aberdeen)

ROLAND FP8 in good condition. ☎ Simon 01628 822893 (Berkshire)

ROLAND JD990, Emu Morpheus, Roland D550, JP8000. ☎ 0181 449 9698

ROLAND MKS80, Sequential Prophet VS, Roland TR909, Emu Emulator 2, mint, fully working only. ☎ 01444 239638 (Sussex)

S50 DIGITIZER TABLET, looking for digitizer in good condition. ☎ Alex 01702 589369 (Essex)

SOUNDQUEST MIDIQUEST V.6 PC editor wanted. For sale: Marantz SD40 cassette deck, £35, 8U table rack, £15; approx 50 SOS mags, £20

ROLAND SH101 pitch-bend lever/unit. ☎ 01287 63818

ROLAND TB303, R8 soundcards, Novation BassStation. ☎ 04325 114497 (Exeter)

VIDEOS OF THOMAS DOLBY, 'Golden Age Of Wireless' live, OMD live 1981 in VHS format, £10 each paid. ☎ Steve 01526 323468 (Lincs)

YAMAHA CS15D, ROLAND JX3P, in the Shropshire/West Midlands/North Wales area, must be in OK condition, and under £300 w moindrot@n-shropshire.ac.uk

YAMAHA CS80 in good condition, can collect; ARP Odyssey MK1, Soundcards for Morpheus and Roland R8 drum machine wanted. ☎ 01535 645233

YAMAHA DX7 MK I ROM and RAM cards wanted. ☎ Dave 01827 53424 (Staffs)

YAMAHA RY30, may part-exchange for DR660, camcorder, manuals, Sequential SixTrak, TR626, obscure circuits and circuit diagrams. ☎ 01484 663606 (Huddy)

MISCELLANEOUS

ACOUSTIC DRYROOM, weighs 2 tonnes, made of lead, comes in 22 sections with its own silent air-conditioning, ideal for pro setup, Casio CZ500 8-track sequencer, manual's and flightcase, £200; Roland U220 sound module, excellent condition with manuals, £300. ☎ 0976 220461 (Manchester)

ATARI HIGH-RESOLUTION EMULATOR, converts any TV or colour monitor into high resolution, complete with instructions, £10. ☎ George 0181 785 9862

DON 2 DJ MIXER, (Intimidation) for sale, features BPM counter, kill switches, drum base, barely used, home use only, as new, £420. ☎ 01203 775477 (Coventry)

FORD CARGO 7.5 ton, 6 cylinder diesel (non HGV), 21 x 8 x 8-foot GRP box, professionally converted with lights, mains, carpet, acoustic insulation, daylight, Foxguard alarm, sleeper cab, tail lift, MOT, taxed, low mileage, serviced, in very good condition, £7950 ono (private sale). ☎ 0181 875 9712 (SW18)

14U RACKMOUNT flightcase, shock-mounted with wheels on rear, £175, XR300 SMPTE unit, £100. ☎ 0116 255 1009 (Leicester)

GROOVE ELECTRONICS M2CV MIDI to CV/gate convertor, provides two independent channels and many control options, fitted with second channel, battery-backed RAM, DIN sync 24 output which controls early Korg and Roland equipment such as the TR808, TB303, arpeggiator output, reliable, with box and manual, £175; Back issues of music tech magazines, SOS, FM, MT, £1+ P&P each. ☎ 01794 519659 (Hampshire)

INTERNATIONAL MUSICIAN magazines, over 100 from 1981 to 1991, offers. ☎ 01142 686751/0467 656258 (Sheffield)

KORG G5 bass guitar synth processor, creates new waveforms with filter and resonance from any bass guitar, £90. ☎ 01780 752325 (Lincs)

PEAVEY CS800 stereo power amp with flightcase, ready to gig, £300 ono. ☎ 01773 528757

ROLAND U110 ROM cards. ☎ Mick 01203 306130 (Coventry)

TECHNICS SA EX700 home cinema receiver, 60wX5, Dolby Pro Logic centre, 100w, boxed as new, 6 months old, £390. ☎ 0121 430 7706

TWO-TIER KEYBOARD STAND, single central upright support, black, adjustable, used as single or double, £45 including carriage. ☎ 01628 473853 (Bucks)

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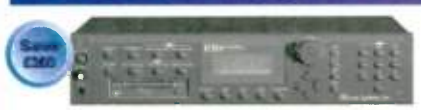

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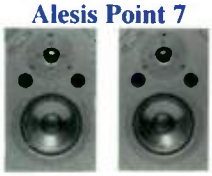

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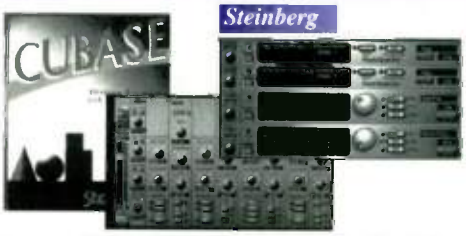

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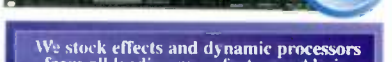

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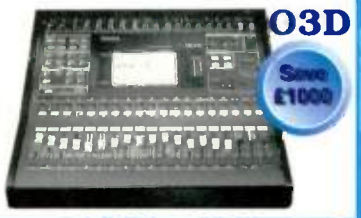

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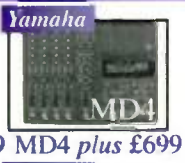

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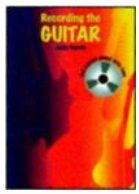

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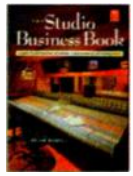

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In this practical and clearly-written book, Ian Waugh explains all aspects of the subject from digital audio basics to putting together a system to suit you own music requirements, using the minimum of technical language, the book explains exactly what you need to know. On a practical level you will learn about: sample editing, digital manufacturing, digital FX processing, intergrating MIDI and digital audio, using sample CDs, mastering to DAT and direct to CD, digital audio and multimedia. 256 pages

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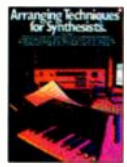

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by Peter Forrest

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By Mark Vail

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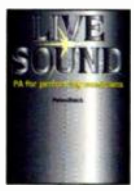
LIVE SOUND



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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 & Toolbox
- 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 rest (HyperEdit, Matrix Editor Cycle Mode and more)

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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 Labyrinths unique Video Index System VIS TM which uses a combination of permanently on screen Time Code together with a Contents Listing

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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!

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CUBASE

STEINBERG CUBASE

This manual is presented by Chris West, Steinberg expert. It's very much a practical, get up and running' video showing the novice user exactly how to install and begin using Cubase, whether they're running the program on an ST Mac or PC computer – there's even a basic background on using the computers themselves! All of Cubase's controls are shown explained and demonstrated in depth Once you're familiar with the basic controls, Chris takes you slowly through recording your first session, followed by overviews of the various edit screens It's rather like having an expert tutorial that you can run again and again in the comfort of your home, until you can use Cubase like a true pro
Topics covered include, the main screen, customising names and outputs, copying and pasting between arrangements, MIDI filter, cycle mode recording, the tool box, all edit screens

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Run time 1hour 30 minutes Format VHS (PAL)
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SYNTHESIZERS

ROLAND XP-80

In association with Roland UK & Roland Corp USA
You will have the knowledge of an experienced Product Specialist permanently available in your own home when you purchase this essential video. It enables you to quickly grasp the knowledge of the many functions, and how to use your newly acquired knowledge The video also incorporates Labyrinths unique Video Index System VIS TM, which uses a combination of permanently on screen Time Code together with a Contents Listing

CODE V073 **£24.99**
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ROLAND XP-50

This XP 50 video owners manual is produced by Roland Corporation US and covers all the major features of the instrument in detail This is an application based video that provides many examples of how your new found knowledge can be applied Just a few of the 30 separate topic areas covered are Effects, Choosing Sounds, Loading a Song, Loop Recording, Copying a Track to Pattern, Making an RPS Set, Track Editing, Multitrack Recording, Patch Editing, Creating Splits & Layers in a Patch

CODE V063 **£24.99**
Running time 63 minutes
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ROLAND JV-1080 VIDEO MANUAL

Roland's amazing JV 1080 synthesizer module is covered in detail in this informative video Presented by Tim Walter the video the video guides you through the basics, and leads you painlessly onto the advanced features The video even shows you how to fit the expansion boards & gives demonstrations of some of the wonderful sounds they contain Once again this video has been produced in association with Roland UK & USA to ensure that everything it contains is accurate, and relevant to the new and more experienced users alike

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EMAGIC

EMAGIC NOTATOR VIDEO TRAINING MANUAL
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RING FOR MORE INFORMATION

VOICE TRAINING

VOCAL WORKOUT Video

by Sam West
Singers of varying abilities will find this video a great aid in assisting their vocal efforts. It begins by explaining the principles of voice production. Breath control excercises 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 practising. First of all the exercises are sung, in various keys and then with musical accompaniment and melody line, so you can concentrate more on your voice while practising (karaoke style).
Vocal exercises can be boring, but this studio recording has been produced and presented to a very high standard, with interesting musical accompaniments to the exercises.

CASSETTE CODE MC001 **£7.95**
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SOS CDs

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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 operatic 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 measuring frequency response, whenever and wherever you may need to

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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

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 majors 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

LEVEL THREE

This video is packed with information and professional tips on advanced MIDI applications in the home studio, including interfacing with sequencers, which sync code is best for which application and why. Hit producer Martyn Phillips (Erasure, Londoa Beat) discusses modern recording techniques, and top programmer Paul Wiffen examines
the opportunities and benefits offered by hard disk recording. It offers
practical advice on sampling - how to save time and tracks: plus professional tips on advanced arranging and
mixing techniques, including
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CODE V007 **£24.95**
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Index to Advertisers

Artists Wanted	300	Duplication	292-297	Lineage	290	Soft Cases & Covers	300
Clubs	299	Flight Cases	300	Programming	291	Studio Acoustics	290
Courses	298-299	For Hire	291	Recording Studios	291	Studio For Sale	301
Digital Editing	296	For Sale	284-290	Services	297	Tuition/Programming	291
Digital Mastering	297	Insurance	301	Situation Vacant	300	Wanted	290

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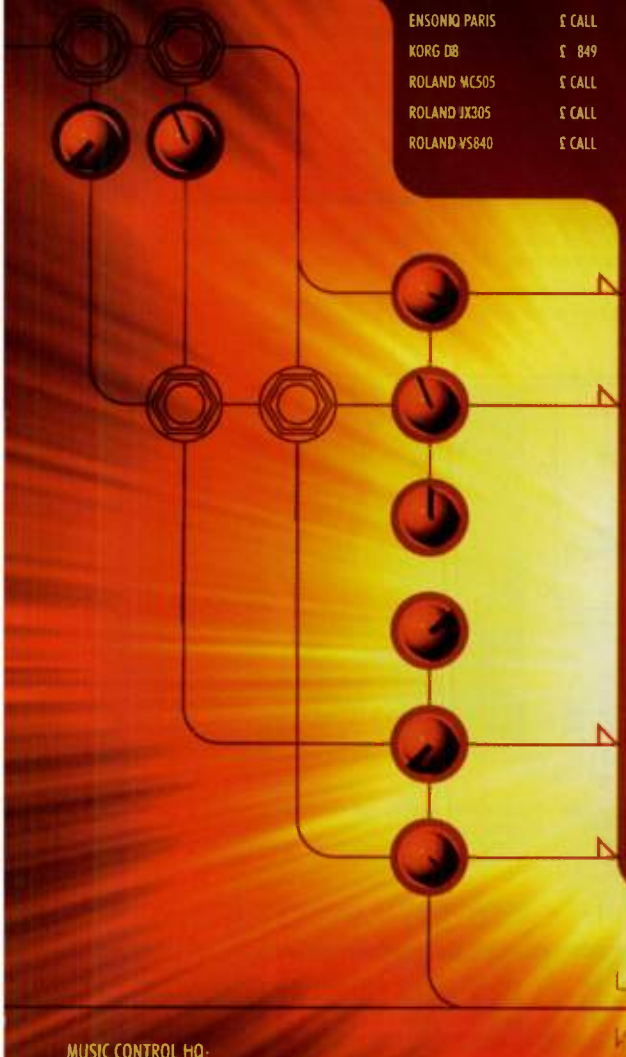

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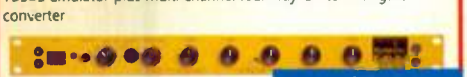

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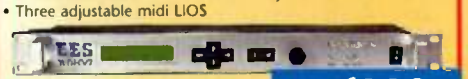

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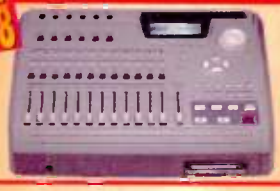

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Akai UK	0181 897 6388	89, 237
Alchemea School of Recording	0171 359 3986	267
Allen & Heath UK	01326 372070	109
Andertons Music Company	01483 456777	175
Arbiter PLC	0181 202 1199	17, 82-83, 87, 103, 130-131, 143, 161, 174-175, 229, 257, 263
Audio-Technica	0113 277 1441	111
Barnes & Mullins	0171 278 4631	209
BCK Products	01992 524442	73
Behringer Spezielle Studio Teknik	00 49 2154 920666	215
Blue Systems UK	01799 584095	55
Brandoni Music	0181 908 2323	143
Brixton Exchange Mart (BEM)	0171 733 6821	211
Comtracks UK	0131 468 1150	179
Concert Systems	0161 927 7700	414, 271
Creative Labs	01734 344322	39
DACS	0191 438 5585	251
Dawsons Music	01925 632591	206-207
Digital Village	0181 440 3440	112-113
Drawmer Distribution	01924 378669	217
E-MU Systems Incorporated	001 408 438 1921	197, 225
Eddie Moors Music	01202 395135	276-277, 278-279
Emis	0117 956 1855	185
Exclusive Distribution	01462 481148	81, 173
Gateway School of Recording	0181 549 0014	271
Gig Sounds	0181 769 6496	227
HHB Communications	0181 962 5000	98+99, 133, 135, 137, 182-183
HW Audio	01204 385199	227
HW International (Shure)	0181 808 2222	201
Kenton Electronics	0181 337 0333	259
Key Audio Systems	01245 344801	77, 127, 237
Korg UK	01908 857100	OBC, 49
M Corporation	01425 480569	90-91, 92-93
MacMusic	01324 826647	155, 251
Mac & Moore	01442 870300	191
Marks Music	01473 287872	129
Midiman UK	01205 290680	123
Millennium Music Software	0115 955 2200	150-151
Music Connections	01245 354777	57, 58-59, 60-61, 62-63, 64-65, 66-67, 68
Music Lab	0171 388 5392	Loose Insertion
Music Village	0181 598 9506	118-119, 120-121
Musictrack	01462 812010	IFC
Natural Audio	01462 743300	188-189
Otari Deutschland	0049 215 950861	107
P & R Audio	01323 849522	205
Peavey Electronics Corp UK	01536 461234	193
Percy Prior's Music Store	01494 443418	277
Project Audio	0171 428 9700	170-171
Project Music	0181 570 4444	145
Raper & Wayman	0181 800 8288	41
Red Sound Systems	01494 429321	219
Red Submarine	01904 624266	167
Roland UK	01792 515020	264-265
SAE Technology College	0171 609 2653	241
SCV London	0171 923 1892	IBC, 37, 95, 269
SFIDA (Creative Learning)	0181 749 2828	155
Smart Sound Direct	01883 346647	247
Soundcraft Electronics	01707 665000	13
Sound Business Studio Sales	0181 559 0373	195
Sound Control	0800 525260	164-165
Sound Division	0171 609 3939	302-303
Sound Technology plc	01462 480000	5, 203, 243
Sounds Live	0191 230 3422	249
Sound Valley Distribution	01494 434738	153
Stirling Audio Systems	0171 624 6000	71
Spirit by Soundcraft	01707 665000	10-11
SRTL	01243 379834	220-221
Studiomaster	01582 570370	255
Studiospares	0171 482 1692	79
Syco Systems	0171 625 6070	138-139
System Solutions	0181 693 3355	147
TEAC UK	01923 819630	169
Tech-mate UK	01206 793355	199
Terratec	01600 716911	101
The Academy of Contemporary Music	01483 456788	97
The Global Distribution Group	01799 584925	175, 255
The Guitar, Amp & Keyboard Centre	01273 676835	244-245
The Solutions Company (TSC)	0181 480 1234	1
The Way Out West Music Company	0181 744 1040	47, 235
Thomann Musikhaus	00 49 9546 92230	231
Time & Space Distribution	01837 841100	210-211, 212, 245
Tony Larking Audio	01462 490600	213
Turnkey	0171 240 4036	24-25, 26-27, 28-29, 30-31, 32-33, 34-35, 209, 265, 273
Unity Audio	01920 822890	185
Xpression!	01444 440955	257
Yamaha - Kemble Music	01908 366700	45, 178

WRH

sounding Off

The latest digital recording systems offer smart facilities in spades, but if you're a newcomer to recording technology it can be hard to find out what's really best for your often simple requirements. DAVE GALE wonders who you gonna call...

You have a good grasp of MIDI sequencing, and you like the way your compositions are produced — OK, they might not be to the same quality as Abbey Road, but for a project musician on a tight budget they sound great.

So what's missing from your world of electronic sound? Quite possibly the unmistakable presence of a live performer in the mix. Even the most seasoned composer of instrumental music will probably want to use a singer at one time or another, so what are the options? Well, there was a time when you knew exactly where you stood if you wanted to record 'live' sound. With a mere £400 in your pocket, you could venture down to your local music store and purchase a 'Portastudio' [*Tascam trademark*], which would allow you to record your tracks one after the other with reasonable quality. The more money you spent, the better the machine you'd get, often equipped with high-speed tape transport, dbx or Dolby C noise reduction, or perhaps more tracks. But now a new and almost sinister technology has emerged, allowing mere mortals with £400 in their pockets to purchase a program that will run on a Mac or PC, and allow them to sing over the top of their MIDI tracks and even see the audio! Is this too good to be true? YES! Primarily because life will never be as simple as those Portastudio days again.

A friend of mine, who is a vocalist, recently decided to make the move into sequencing. He asked for my advice, which I was happy to give, and I also suggested that he took a wander up to the West End of London to look at some equipment. He had an idea that he wanted to buy a Macintosh computer with Emagic *Logic* software, but he was confused by the whole concept of recording. As he's a singer, the ability to record live audio tracks is quite important. Would he be better off with a tape-based multitrack, a hard disk or MiniDisc multitrack, or should he buy an audio program for his Mac? A salesperson in one shop he ventured into quite happily told him that he should most definitely purchase *Logic Audio*, because he only had to take his Shure SM58 microphone and plug it into the back of the Mac and he would get perfect recording results every time! Now, for the uninitiated, the only audio sockets you find on the back of the current generation of Macs run at line level, so if you connected a microphone to that input, you'd barely hear a whisper, because there's no mic preamplifier built in to boost the signal. To my knowledge, this is generally the case for external audio cards as well.

My friend, having heard me talk about computer-based hard disk recording, and the best mixers for that task, also asked the salesperson which mixer he should buy, to which the reply came "Oh you don't need a mixer!" Quite how my friend was going to listen to his synthesizer and his audio at the same time, without the use of a mixer, is beyond me — not to mention the fact that without a mixer or mic preamp he wouldn't have a signal to record anyway!

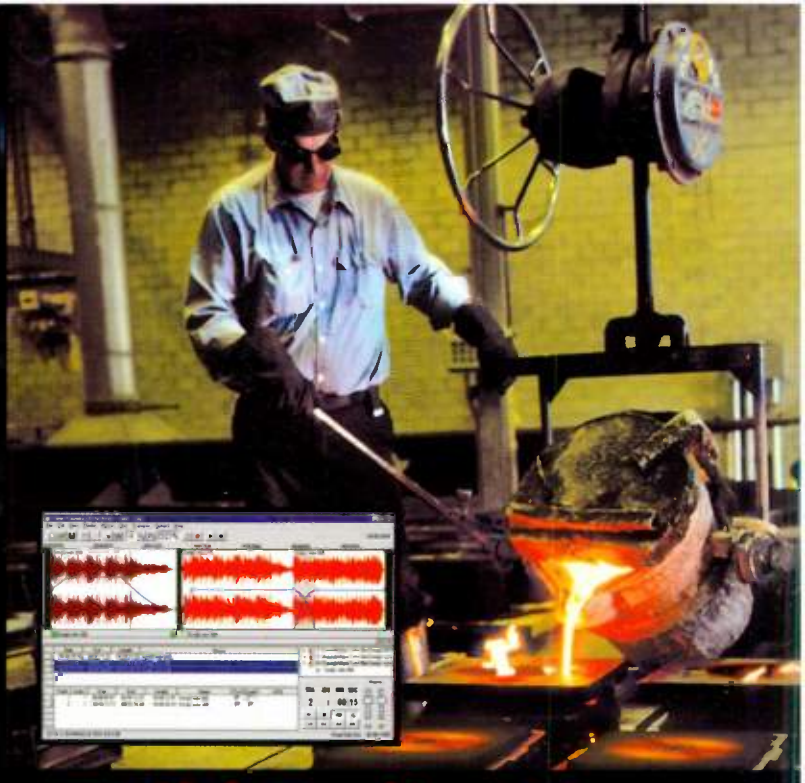
How can advice such as this come from a supposedly trained member of staff in a well known music store? I wish I could say that this sort of bad guidance is rare, but as I visit and talk to people in connection with my freelance work, it seems to be a common story. Is it the case that some companies hope that, when the customer complains that their system doesn't work, they can merely sell them more equipment so that it does work? Do the staff just not use the equipment enough to know the pitfalls of some of the products available today? Or perhaps some shop wages are so low that staff are desperate to sell gear just for the commission.

Whose advice *can* you trust? Over the years, I've found that the best advice you can get comes from current users of the equipment you're interested in buying. Ten years ago that meant a close circle of friends, but now, of course, the world can be your friend via the Internet. You can be sure that someone out there has already experienced the problems that you might come across if you decide to buy a given item. There are many user groups on the Internet that will help you in your hour of need — people who use the products day in, day out, and can often advise you better than your local music store, as they have specialist knowledge.

As for purchasing equipment, read as much as you can on the subject before you buy. If you're buying a computer system to run MIDI + Audio software, buy it from one outlet rather than going to different shops for different bits, in search of the lowest overall price. It might cost you a little more, but at least you can be more confident that it will all work together. If it doesn't work, take it all back to the supplier and tell them to fix it or give you a refund.

So what of my friend? Well, he's very happy with his Macintosh and MIDI-only *Logic*, and on my advice has bought himself a cassette multitracker for very little money — about a third of the cost of a *Logic Audio* system. The technical quality may not be up to the standard of a digital recorder, but the artistic presence of his voice is great. What's more, it works just fine! SOS

If you'd like to air your views in this column, please send your ideas to: Sounding Off, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambs CB3 8SQ. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address. Email: sos.feedback@sospubs.co.uk



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