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EXCLUSIVE PREVIEW!

PLUS

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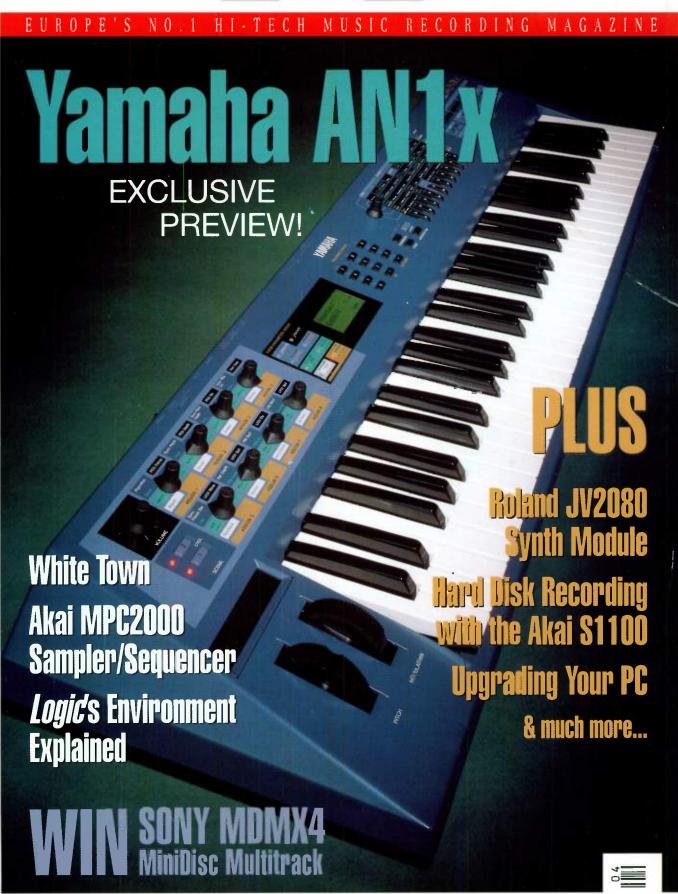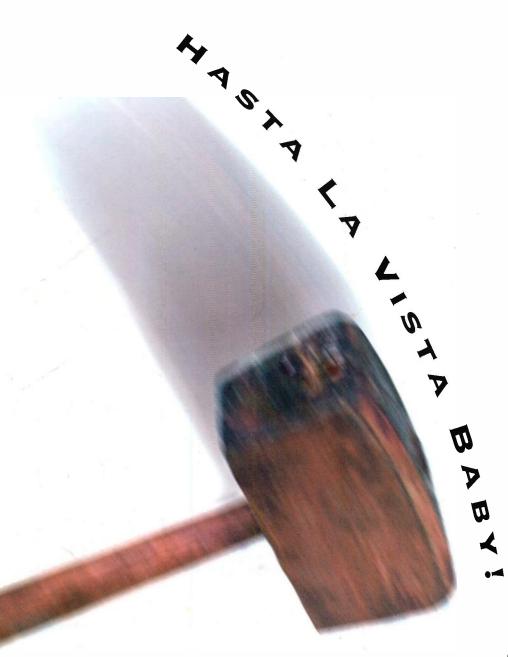
Logic's Environment Explained

WIN SONY MDMX4
MiniDisc Multitrack

ENSONIQ DP/PRO EFFECTS • SOFTWARE SYNTHESIS: PART 1
SHERMAN FILTERBANK • PORTING BETWEEN SEQUENCERS
TASCAM M1600 MIXER • BBE 262 ENHANCER • BRUCE FAIRBAIRN
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HASTA LA VISTA BABY!

Get FreeStyle Version 2.0 and say good-bye to robotic metronome clicks that choke the feel of your music before it even gets recorded. Because with FreeStyle's innovative new SenseTempo™ feature, you can record into your computer as freely as you like, and FreeStyle will detect the tempo on the fly. The result? Instant, readable music notation and easy, musical editing with measures and beats. And with a host of new advanced features such as SMPTE sync, smart note spellings, and meter/tempo/key changes, FreeStyle 2.0 gives you all of the sequencing power you need — in what Keyboard Magazine calls "the first program we've seen that deserves to have the title of 'intuitive' bestowed upon it." So go ahead and let loose. With FreeStyle 2.0, you call the shots.

New version!

FreeStyle™ 2.0

leader

To the layperson, the recording studio has always been a place of mystery and wonder. I mean, how many times have you been asked, "How do you know what all those knobs do?" when some bemused visitor stumbled across your mixer for the first time? People used to say exactly the same thing to me in the '70s when all I had was an MM 8:2 mixer with a Teac open-reel 4-track plugged into it, and a Great British Spring reverb hanging off the wall. The truth of the matter was that, once you'd found your way around a mixer, you could walk into almost any studio in the country and pick up somebody else's session straight away. No matter what mixer or multitrack recorder you came across, they all worked in pretty much the same way — the only time anybody opened a manual in those days was if they used it to wipe curry stains off the armrest of the console. Aside from deciphering the handwriting on the patchbay, probably the most complicated technical issue was figuring out whether the session tape had been stored tails in or tails out.

As time went on, multi-effects and MIDI sequencers started to appear, but you could nearly always find a preset that would do the job if you couldn't figure out the operating system, and the sequencer was bound to be either *Notator* or *Cubase*. Eventually, we all became comfortable with our equipment, able to push the technological side of our art into that recess of the mind normally reserved for driving up the M40 or washing dishes. This left the majority of our mental processing power free for creative work. So when did it all go wrong?

First came digital multitrack tape machines, with their fancy remote controllers, track copy functions, formatting and cloning regimes, location facilities and virtual compiling options, then along came sequencers with audio, and digital multitrack recording packages for Mac and PC computers.

Now no two studios on the planet are alike. Even if they are equipped with the same hardware, wired up the same way and decorated with the same wallpaper, they are still completely different. Computer desktop spaces are organised differently, everybody seems to be running different software to everyone else, there are conflicting file formats and software versions, different ways of backing up audio files, and plug-in software for just about every purpose imaginable, from creating surround sound to counting the number of other plug-ins you've got installed. There are different versions of software drivers, conflicts between hardware and software, innumerable different ways to patch things up, and hidden setup pages at every turn. This is serious Tower of Babel territory, on a global scale. We're rapidly approaching an era in which we'll only ever be able to operate our own studio setups — go around to a friend's house and the chances are you won't know where to start. What's more, anyone coming round to your place is likely to view your system with the same glazed expression of incomprehension. To quote *SOS* PC writer Martin Walker when he last visited me, "How can you possibly work with your PC desktop and mouse set up like that?" I'd just let Windows 95 put things where it thought best, but obviously he'd customised his system to such an extent that he felt mine was almost unusable. I shudder to think what I'd make of his system! It can only be a matter of time now before we walk into another studio, take one look at the virtual gear spread across the 21-inch monitor, and ask, "How can you possibly know what all those knobs do?"

Paul White *Editor*

158 Roland JV2080

REVIEWS

FEATURES

WIN SONY MDMX4 MINIDISC MULTITRACK p82

in this issue

Crosstalk

Platform Games

Looking through a substantial pile of SOS back issues recently, I came across an article by Martin Russ ('MIDI Past Present & Future', which appeared in June 1992) that mentioned a Universal Non-Real Time System Exclusive format, by which one is supposed to be able to transmit entire MIDI Files via MIDI. As a long-term Atari user who has just defected to the Macintosh, I believe this may be just what I'm looking for and wondered if you could possibly enlighten me as to how it works. What I'm after is a way of transferring all my old Steinberg Cubase song files to the Mac.
Roger Carruthers
Cwmbran

Derek Johnson replies: *There is an easier way to get files from the Atari, and indeed the PC, onto your Mac. Using a small utility such as PC Exchange or Insignia Solutions' Access PC, it is possible for the Mac to reliably read — and format — PC disks. Since ST disks are not reliably recognised by the Mac — they will sometimes read, and sometimes not — you might find it handy to prepare some PC-format disks on your Mac, copy your Cubase files to those disks, and use them to transport your files to the Mac. The song files can now simply be opened from within Cubase. Also, take a look at the article appearing in this very issue on transferring song data between computer platforms and programs. It starts on page 94.* ⏎

Dump Dilemma

As an owner of a Roland S330 sampler, I was delighted to see an article dedicated to it in February's SOS. The article was great, containing much useful information. One small point is the part where the article mentions dumping samples via MIDI. I've spoken to Roland about this, and they say it isn't possible. If it actually *is* possible, could you please tell me how it's done?

I've also heard rumours of software for the Atari ST or PC that will read S330 disks and enable you to edit samples. Do you have any further information on this subject?

Thanks for a great magazine.
Ben Simmonds
Brighton

Derek Johnson replies: *Thanks for the praise, Ben! Roland are technically right when they say the S330 can't initiate a MIDI Sample Dump — by itself. You need another sampler or a piece of computer software to initiate the dump for you. At this point, the S330 will quite happily transmit data. There may well be some confusion if the external device or software is expecting 16-bit samples, and a little practice may be needed to get samples into the Tone locations you require, but a bit of experimentation should see you through.*

With regard to software that reads S330 disks,

there's the shareware D-Sound Pro for the Macintosh, which we mentioned in the article. This is very straightforward: stick the disk in the Mac's drive, click on a few buttons, and that's it. I know of two small packages for the Atari ST, which I believe were in the public domain, but seem no longer to be supported. The Software House's S330 Utilities — the last version I know of is dated 1989! — put the ST in control of your S330, and gave you more flexible access to Patches and Tones. As you know, one of the S330's less endearing aspects is its unwillingness to load individual complete Patches from floppy disk, so the ability to do this from an ST, even to a limited extent, was rather welcome. The other program you might be able to find is a W30 Tone editor which read W30 disk directly into the ST (I must admit to not having seen this in person — I spotted it in an old PD list!), although it may not be compatible with S330 disks. I'm not sure if any PC software will allow you to do anything similar — readers who know better, please drop us a line — but most generic sample editors that offer MIDI Sample Dump Standard capability should be able to extract samples from the S330, let you edit them on computer, and beam them back to the S330. Two venerable ST software packages — Steinberg's Avalon and Digidesign's Sound Designer — both actually had dedicated S330 sample retrieval routines. ❑

Going to Work on an Egg Box
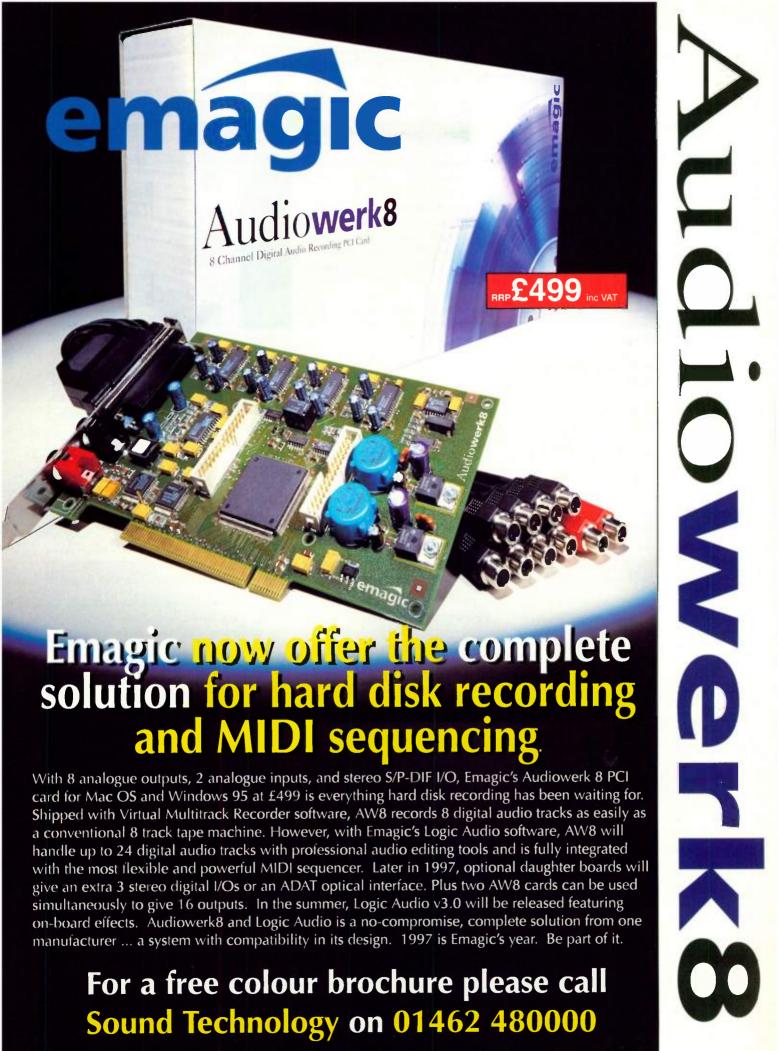
I read through Andrew Parry's interesting article about control room design in the January 1997 issue, and found it really comprehensive. I would like to add a few tips to improve constructive diffusion in readers' own home studios. For those who are too lazy to build their own diffuser from scratch (as shown in the aforementioned article) and for those who are really on a budget, I suggest that they use some old-fashioned egg boxes as scattering surfaces. Although often erroneously used for soundproofing, egg boxes show a diffusion co-efficient nearly as good as a commercial diffuser for a fraction of the price, giving a relevant spread of incident sound energy in both frequency and

time domain; I actually discussed this in my graduation thesis. Even the stereo imaging could be improved by means of diffusion surfaces mounted on the ceiling between the monitors and the mixing position. In fact, this trick allows the ceiling's strong first reflection to be directed toward side walls, giving you a wider stereo feeling. Finally, you can provide rear wall diffusion and attenuate the annoying frequency boost near the back of the room at the same time by hanging an array of egg boxes from the ceiling to a couple of feet from the floor, leaving about an 8-inch air gap from the rear wall and fitting some rockwool onto the back of the panels (the

sides facing the rear wall). I hope these few hints may help some people to improve their control room acoustic.
Luca Branchi
Italy

Paul White replies: *In theory, there's no reason why this shouldn't work, though the limited profile depth of egg boxes means that the benefits will be confined to frequencies above 1kHz or so. Custom diffusors may be more time-consuming and more expensive to make, but they will work down to lower frequencies. Has anybody else tried this, and if so, what kind of results have you achieved?* ⏎ ▶

Crosstalk

The Tipmeister Strikes Again!

I recently stumbled onto a really cool pop shield: an embroidery hoop, for about £1.50. These are designed to have material stretched across them and are composed of two wooden hoops sandwiched together. They come in various sizes, look much better than a wire loop, and you can even buy the stockings at the same shop! Actually, I use some acoustically transparent mesh from a local speaker manufacturer. If you glue two of these hoops together, you get a 'two mesh with air gap' type of pop shield.

Stephen Bennett
via email

Thanks for beaming this info to us Stephen... now we know where you spend your spare time! ❏

Remotely Interesting

We read with interest Paul D Lehrman's article on reducing computer-related noise in the studio, and would like to point out IRCAM's solution to maintaining long cable runs between a Macintosh and its monitor and keyboard. Our Mac Motus, which was actually mentioned by Paul Tingen in the course of his piece on IRCAM in December 1996's *SOS*, offers a particularly elegant way to keep noisy computers well out of earshot. Inform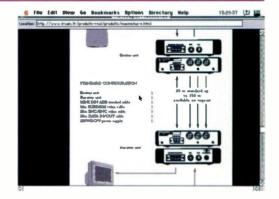ation on Mac Motus is available on the IRCAM web site (**http://www.ircam. fr/produits-real/produits/macmotus-e.html**).

In the meantime I wanted to let you know that we think you do a great job and that *SOS* is becoming more and more à major reference for us.
Vincent Puig, Marketing Director
IRCAM
France

Derek Johnson replies: *We're more than happy to reiterate the existence of the Mac Motus; as Vincent says, there is plenty of information on the IRCAM web site, but here, for the net-less amongst you, is a summary. Mac Motus is a remote monitor/keyboard adaptor that basically consists of two units. A transmitter is placed near your computer and a receiver*

sits at the other end of a bundle of cables, up to 150 metres away, with the keyboard, mouse and monitor attached to that. Imagine: the noise produced by the fan in your Power Mac and hard drives could be nearly 500 feet away from your working environment! No software is required, and the system is compatible with any screen that can be used with a Mac. A Mac Motus colour kit costs 4900FF (postage inclusive in France — contact IRCAM for other shipping details). That's something over £600 at today's exchange rate.

IRCAM can be contacted at 1 Place Igor-Stravinsky, 75004 Paris. Tel 0033 1 44 78 47 60, Fax 0033 1 42 77 29 47. ❏

No Room for the SIMM?

I bought the Guillemot Maxi64 soundcard after reading the review in the February issue of *SOS*. At the same time I bought 16Mb of extension RAM and a Yamaha DB50XG daughterboard. However, the DB50XG does not physically fit onto the card. Before it could be properly connected, I had to wait for Guillemot in France to send me a cobbled-together extension connector. The daughterboard now swings off this and takes up another slot in the PC. No mention of this in the article. Also, the 16Mb of extra RAM cannot have anything loaded into it, as the necessary software does not come with the card. I received a beta-test version of this yesterday, emailed from France, although there is no manual yet. This appears not to work. No mention of this in the article. Did Martin Walker review the same product that I bought? By the way, Ubisoft cannot provide any tech support for this card — they passed me back to my supplier. The problem is, neither can they! Everything is passed back to Guillemot in France.

Keith Jolley
via email

Martin Walker replies: *It is always appreciated when people bring potential problems to our attention. My DB50XG fitted onto the Maxi64 with no problems and worked beautifully. As I said in the review, "A single socket is provided for a SIMM module". Unfortunately, I was not sent one for the purposes of the review, and could therefore only comment on the socket as a feature of the card. The problem only arises if both DB50XG and SIMM are attached, but I can certainly appreciate your frustration. I have contacted Guillemot in France on your behalf, and they say that the Maxi64 was designed before the DB50XG existed, and that this is the only daughterboard to cause problems. Apparently others, such as the Korg Wave and Roland SC55, fit OK with the SIMM also attached.*

Guillemot do provide the spacer you describe free of charge if you run into problems with long daughterboards. Ubisoft have since sent me a sample spacer, which fitted the Maxi64 card firmly, but the DB50XG seemed quite a loose fit. I have reported this to them, and they are currently discussing the situation with Guillemot — let's hope a better solution is forthcoming. The drivers you mention have been confirmed as still in beta test, but final release versions are promised by April.

Ubisoft assured me that tech support should be available in the UK as of now — at the time of writing, their newly appointed product specialist was being trained by Guillemot. It's a shame that this arrangement was not in place when you had your inital problems, and I hope they haven't completely spoiled your enjoyment of what is still a well-specified and keenly priced product. ❏

shape of things to come

by Derek Johnson

Talking pages

Regular *SOS* contributor Martin Russ has a new book out, published as part of Focal Press' Music Technology series. *Sound Synthesis and Sampling* is a weighty tome, priced at £25, and is all about the principles of electronic musical instruments. It provides an introduction to the most common forms of analogue and digital synthesis, as well as many less common techniques usually encountered in research and academia. The book has been written in an almost entirely non-mathematical fashion, and is extensively illustrated with diagrams; questions are provided at the ends of chapters for revision purposes, and a glossary appears at the back of the book. *Sound Synthesis and Sampling* is available from *SOS* mail order, code B340.

Also in the same series as Martin's book are *The Audio Workstation Handbook* by series editor and audio guru Francis Rumsey (order code B341, £19.99) and *Acoustics and Psychoacoustics* by Professor David M Howard (order code B342, £25). The former is a practical overview of computer-based and stand-alone digital audio systems, while the latter is a comprehensive introduction to acoustics and psychoacoustics, as related to human hearing, sound generation in musical instruments, and the electronic processing of sound. Postage for each of the books is £2.50 UK, £5.50 Europe and £8.50 ROW.

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

Still Werking...

There can be few bands that are subject to as many rumours as Kraftwerk, with albums and gigs hinted at at regular intervals, and little forthcoming. However, in what must be the biggest coup of recent years, the organisers of this year's Tribal Gathering, due to take place on May 24 at Luton Hoo Estate, have nabbed the reclusive German electro pioneers to top the bill. This will be Kraftwerk's first UK appearance since 1991, and follows two years of negotiations. Given the band's influence on techno music, going right back to its inception in Detroit, it is hoped that many original Detroit techno pioneers can also be brought to the event. Also appearing live will be Orbital, Daft Punk, Cornershop and many others, plus loads of DJs. With room for 40,000 people and 19 hours of activity, it should be quite an event

Still on the Kraftwerk front, the group were spotted on the Quasimidi stand at the recent Frankfurt Musik Messe (see report later in the mag). They have been Quasimidi users for several years, and played mixes from what should be their next album — and that's all-new material rather than remixes. More details when we get them.

Global drums

New marketing company Global Distribution have taken on UK distribution of the German-built JoMox Xbase09 drum machine. Based on MIDI-controlled analogue circuitry, the Xbase09 produces three instruments — bass drum, snare and hi-hat — all under real-time MIDI control. The sounds can be drastically altered, in real time, including reverse playing. In addition, there are 100 performance memories (or kits), 64 pattern memories and 10 song memories. Pricing was just being fixed as we were going to press, but expect it to be under £600. Incidentally, Global Distribution are also handling the Syntecno Teebee TB303 clone (reviewed *SOS* July 1996), can supply the Mutronics Mutator filter bank (also reviewed in July 1996) and will soon be handling the American Glyph Technologies range of hard drives and recordable CD products.

A The Global Distribution Group, PO Box 39, Ashdon, Saffron Walden, Essex CB10 2TF.
T 01799 584925.
F 01799 584094.

Sampling made hard?

S ample CD specialists East West and NemeSys Music Technology, a developer of PC audio software, have recently agreed to work together on *GigaSampler*, which they claim to be the world's first and most powerful hard disk-based sample playback system. At the recent NAMM show, East West had a 1.5Gb sampled Steinway Piano running on the *GigaSampler* software to demonstrate this sampling technology. The Piano had seven velocity layers for every key, in order to achieve unparalleled quality and playability.

All current music sample playback systems utilise RAM, which is expensive compared to hard disk space. Based on Nemesys technology, *GigaSampler* uses hard disks and other mass storage devices instead of RAM memory for primary real-time instrument access. Thus instrument samples no longer have to be compromised with artificial looping, filtering, and processing to conserve expensive RAM space. Sounds *most* interesting...

- **A** East West UK, Suite 1A, 25 Meeting House Lane, Brighton, East Sussex BN1 1HB.
- **T** 01273 736733.
- **F** 01273 328881.
- **W** http://www.eastwestsounds.com

Four busses at once!

Y amaha's new compact 4-buss mixer, the MX12:4, is also the first product to come from the company's new Taiwanese factory. The £399 desk offers a fair set of facilities for its price: eight mono channels featuring balanced XLRs (with phantom power) and jack inputs, two stereo channels, four independent group output busses, an effect send, a monitor send, on-board digital reverb, a stereo return, 3-band channel EQ and 7-band graphic EQ on the output. These features should make the desk attractive to live or studio musicians, or bands who want something to gig with that's not wasted when it comes to putting together demos.

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

Ghost: Ready to Ware

M artyn Ware, founder of Heaven 17, has taken delivery of a 32-channel Soundcraft Ghost LE mixer. The Ghost, which replaces a trusted Soundcraft Spirit Studio desk, was installed in Martyn's home studio by the Way Out West Music Company; the console was chosen for its "excellent facilities", and "clean signal path". To celebrate the new desk, and to coincide with Heaven 17's new album — *Bigger than America* — the group are giving away 10 pairs of tickets to any of their April tour dates: April 2 Norwich Waterfront and April 3 Portsmouth Wedgewood Rooms are solo gigs, while April 6 at Birmingham NEC, April 7 at Bournemouth International Centre, April 9 at Cardiff International Centre,

April 10 at the Brighton Centre, April 11 at Manchester NYNEX, April 15 at Glasgow SECC, April 17 at the Sheffield Arena, and April 18 at London's Wembley Arena are all with Erasure.

All you have to do is answer one question, and do a tiebreaker. The question is: From what film did Heaven 17 take their name?
a) *Barbarella*
b) *A Clockwork Orange*
c) *2001: A Space Odyssey*
d) *Attack of the Giant Killer Ants from Mars*
And the tiebreaker: How influential do you consider Heaven 17 to be on today's music? (In less than 25 words.) Answers, by mail, fax or email, should be sent to Way Out West.

- **A** Heaven 17 Competition, The Way Out West Music Company, 47 London Road, Twickenham, TW1 3SA.
- **T** 01707 665000.
- **F** 01707 660482.
- **E** wowpr@aol.com

Unicorn goes native

Mark of the Unicorn's *Digital Performer* MIDI + Audio software package has now reached v2.0. The software works with a range of Digidesign NuBus and PCI-based systems, and has 100% native Power Mac code. Version 2.0 includes all the new features recently introduced in MOTU's major upgrade for (the audio-less) *Performer* v5.5. The tracks window has been improved, and now provides a birds-eye view of both MIDI and audio tracks, and drag-and-drop markers allow users to create, view and edit markers directly in the time ruler without needing to go to a separate window. The new version also provides more extensive support of Digidesign's TDM virtual mixing environment and plug-in architecture; new TDM features include 16 TDM busses, aux tracks, four sends per track and master faders.

Another notable upgrade is the new PureDSP sample rate-conversion algorithm, which lets users convert, for example, material recorded on Alesis ADAT at 48kHz down to 44.1kHz for the final CD mix. The algorithm uses proprietary filters to reduce aliasing and imaging problems. Direct Line Outs mode lets users assign audio tracks to individual outputs, instead of output pairs, for straightforward access to an external mixing environment. Other new features include unlimited multiple mixdowns for an entire sequence (with instant recall), adjust beats, which lets users drag beats and bar-lines in the time rulers of the graphic editing windows and line them up with notes in a MIDI performance (or peaks in an audio waveform), and unlimited 'takes' per track.

A quick trawl through the *Digital Performer* v2.0 brochure also reveals that Sound Manager support will be added in the near future, and this should provide up to 16 tracks of digital audio on a PowerMac, using the computer's own hardware.

- **A** MusicTrack, 19a High Street, Shefford, Bedfordshire SG17 5DD.
- **T** 01462 812010.
- **F** 01462 814010.
- **E** 100415.2665@compuserve.com

'Tis the season to be Holly

Holly Johnson — he of Frankie Goes to Hollywood fame — has recently bought a new Tascam DA38 digital multitrack, to go with his pair of DA88s, to provide 24 tracks of digital audio in his home studio. Using a Tascam IF88AE AES/T-DIF interface, the whole system interfaces with a large Digidesign Pro Tools hard disk recording system. Holly comments: "I record as much as I can here before going into a large studio to record strings and stuff. I decided to supplement the DA88s to allow me to take 24 tracks of pre-recorded material into the studio". The flightcased DA88/38s follow Holly whenever he goes into the studio: "When I've got a lot of the stuff on the computer, I tend to dump it over onto the Tascams rather than attempt to take the Pro Tools system into the studio; there's just something very reassuring about having the material down on tape." While Holly is always recording, there isn't necesarily an album on the way; he's been writing on and off for five years, and there aren't any deadlines.

- **A** TEAC UK Ltd, 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA.
- **T** 01923 819630.
- **F** 01923 236290.

shape of things to come

Retrospec are an American company behind a couple of novel valve-based signal processors. The Juice Box is a valve DI box that offers, according to distributors ASAP, low-distortion, low noise-performance. Class-A circuitry is used throughout, and the design is transformerless. Sufficient gain and headroom have been provided to drive a 10k input at professional level, meaning that you could record an instrument's output direct to multitrack. The Squeeze Box is an electro-optical valve compressor/limiter, providing "high-quality" processing in a package that looks suspiciously like a large guitar footpedal. In spite of this strange packaging, the Squeeze
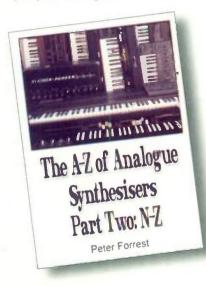
Retrospec set the juice loose!

Box has been designed with a pro spec and pro connectors, making it suitable for a wide range of applications. Both Retrospec units retail at £495 including VAT.

- **A** ASAP Europe, 1st Floor, Units C&D, Tower Bridge Business Complex, 100 Clements Road, London SE16 3DG.
- **T** 0171 231 9661.
- **F** 0171 231 9111.
- **E** 101641.2551@compuserve.com

Synths: from Novation to Zap...

After a long wait, which is understandable given the magnitude of the job, Peter Forrest's *A-Z of Analogue Synthesizers Part Two: N-Z* has now been published. Buyers of the first volume will know what to expect, but to recap for newcomers, here's what you get: minutely researched facts on virtually every synth made by every manufacturer that's ever existed. Much of the information is based on personal experience or primary literature, and a pretty fair idea is given of the

value and usability of almost every instrument. Also included at the back of *N-Z* is a list of supplements to volume one, which were originally offered to book owners as printed sheets. These offer extra information and instruments that came to light after publication. As well as synths, Forrest has also included electric pianos, organs, theremins, and certain other ancillary instruments — plans are afoot for *A-Z*s dedicated to vintage effects, drum machines and sequencers. Well worth a look, and essential if you have any interest in the field, part two of the A-Z is available from *SOS* mail order, priced at £16, order number B338 (postage is £1.95 UK, £5.50 Europe, £8.50 ROW). And, of course, copies of the first volume are still available, priced at £12 each, although supplies are getting low. Cheques/postal orders should be made payable to *SOS* Publications Ltd.

A-Z author Peter Forrest is also behind the Vintage Electrical Musical Instrument Auctions, which are held every April and November. The next is due to run from April 6 to 30, with more info available by phone, fax, post or email. Early entries include the first Roland TB303, an EMS Synthi E, early Vortexion valve mic preamps, a Korg PS3100, and much more.

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

- **A** VEMIA, Star House, Sandford, Crediton, Devon EX17 4LR.
- **T** 01363 777872.
- **F** 01363 774627.
- **E** vemia@mail.eclipse.co.uk
- **W** http://www.eclipse.co.uk/vemia

The A-Z of Analogue Synthesisers Part Two: N-Z
Peter Forrest

SOS can be reached on CompuServe; our email address is 100517,1113. Our full Internet address is 100517.1113@compuserve.com.

shape of things to come

JMJ's air apparent

I t's 20 years since Jean-Michel Jarre released *Oxygene*, the album which brought both the composer and his particular brand of electronic music into the mainstream. Now Jarre has released a sequel, *Oxygene 7-13*, as a sort of continuation from the six parts of the first album. If you know the original, the new album will sound spookily familiar: nothing is exactly copied, but sounds, chord progressions and production tricks could easily have been realised at the same time. Part of this is due to the fact that JMJ actually used his original analogue gear and composed in a similar manner to his late '70s methods for the new project. The result is rather good.

Oxygene 8 is due to be released as a single — with many remixes accompanying the release — and the man himself will be touring extensively this year; dates have been fixed all over Europe during May and June, with UK appearances at Birmingham, Manchester and London on June 6, 7 and 8. *Oxygene 7-13* has been released by Sony Music. Expect a series of budget re-releases of earlier albums in the near future.

If you want to keep up with JMJ's activities, check out his web site: at present the site is under construction (yet had still managed 20,000 hits as of writing), but if you try http://www.jeanmicheljarre.com or http://www.jarre.com, you should find something. Fans could also try out http://www.netlink.co.uk/users/revmag/, which is run by some serious fans (they're also behind *Revolution*, the print fanzine), with well-presented, accurate information, kept firmly up to date.

For the record, the press launch of *Oxygene 7-13* occurred at the Hayward Gallery in London, and 200 pairs of Sennheiser HDI450 wireless headphones were used to audition tracks from the album; the system was installed by Sennheiser in conjunction with Madam Tussaud's Rock Circus, who supplied the headphones from their own system.

Incidentally, and entirely coincidentally, a compilation of Jean-Michel's father Maurice Jarre's soundtrack work has just been released on budget label Music Club — it's called *Film Music by Maurice Jarre* and includes selections from films such as *Dead Poet's Society*, *Witness* and *Lawrence of Arabia*.

education corner

RICHARD HUISH COLLEGE
Richard Huish College, recently identified by *BBC Music Magazine* as a "national centre in music education", is developing an A-level in music technology, and NVQ in contemporary musicianship and new evening classes for both beginners and students experienced in studio music. The college has recently invested in a £15,000 package, including an Alesis ADAT XT, Akai S3000XL and Clavia Nord Lead synth, and has also hired a technician "to keep them all in order."

A Richard Huish College, South Road, Taunton Devon TA1 3DZ.
T 01823 270171.

MEDIA PRODUCTION SERVICES
April 28 sees Media Production Services starting a new course. Designed for people who haven't got the time and/or resources for a full year or even a six-month course, the new 16-week course covers six weeks of analogue recording techniques, six weeks of digital and four weeks of creative production techniques. The course is intended to be practical, and will be run with small groups. MPS have recently added an Akai S3200XL sampler, Tascam DA88, Roland JV1080 sound module and two Mackie in-line desks to their equipment list.

A Media Production Facilities, Bon Marche Building, Ferndale Road, London SW9 8EJ.
T 0171 737 7152.
F 0171 738 5428.

BARTON PEVERIL COLLEGE
Barton Peveril College, a South Hampshire sixth-form college, runs A-level and AS courses in music technology and offers music technology options within its standard A-level music programme. Evening classes in recording techniques, dance music production, sequencing for beginners and songwriting are to be offered again in September of this year. Equipment includes a Tascam 8-track, PC running *Cubase Score* and Atari 1040ST computers.

A Barton Peveril College, Cedar Road, Eastleigh, Hants SO50 5ZA.
T 01703 367200.
F 01703 367228.
E school6@ibm.net

ESTOVER COMMUNITY COLLEGE
Students at Estover Community College took part in a really big recording session recently: 60 steel drums, large drum kit, and miscellaneous percussion. The performances, centred around all-female steel drum band Real Steel, required more resources than the school could muster. To boost recording channels, Allen & Heath supplied GL4000 and GL3000 desks, Sound Technology provided three ADAT XTs, Plymouth-based shops Vibes Music and Keyboards in Action supplied a multitude of leads and mics, Litech helped out with stands and more leads, and the Plymouth Musicians' Cooperative chipped in with a desperately needed Shure SM57 mic (for the snare). Even the local police helped out, loaning the PZMs (pressure zone mics) from their interview rooms. That's 80 channels being mixed down to 24 tracks of ADAT (monitored by the college's fully automated 32-channel Soundtracs LR). Apart from a few blown tweeters, and the need to make even more leads, the session went smoothly and will be released on CD in April.

A Estover Community College, Miller Way, Estover, Plymouth PL6 8UN.
T 01752 781714.
F 01752 788569.
E 100764.3151@compuserve.com

SAE LONDON
SAE London's expansion program is under way, starting with a facelift of the facility: soon to be added will be a new reception area, additional classrooms and new multimedia suites. The college is also building a new 24-track SSL mixer-equipped studio, with a digital multitrack studio on the cards. Incidentally, the Power Mac-based Multimedia Producer Course is now available at the London, Munich and Hamburg branches of SAE.

A SAE London, United House, North Road, London N7 9DP.
T 0171 609 2653.

BOURNEMOUTH AND POOLE COLLEGE
The Bournemouth and Poole College of Further Education is now offering two specialist music courses: the BTEC National Diploma in Popular Music and the BTEC HNC in Popular Music. The college's Knighton Heath Music Centre consists of two recording studios, rehearsal facilities, lecture theatre, technology suite and a canteen.

A Bournemouth and Poole College of Further Education, North Road, Parkstone, Poole, Dorset BH14 0LS.
T 01202 205902.
F 01202 205952.

G-whizz — free video!

If you're intrigued by Yamaha's G50 MIDI guitar system (reviewed in *SOS* December 1996) but haven't got access to a handy dealer and need more information than you can get from a brochure, check out Yamaha's new, free G50 video. Featuring performances and presentations from Dan Huff and Victor Wooten, the 20-minute VHS tape takes the viewer through all aspects of the Yamaha G50 system, from the installation of the G1D divided pick-up through to how to operate the G50 interface itself. Even the recently launched bass system (using the B1D bass pick-up) is demonstrated. The video has been specially produced to offer useful information to existing G50 owners and potential purchasers alike. The latter can evaluate the product in the comfort of their own home, whilst the former will benefit from hints and additional product information from the experts. For a free copy of the Yamaha G50 video (while stocks last) visit your local Yamaha dealer or call the Yamaha Pro Music Information Line.
T 01908 369269.

CHARLES KEENE COLLEGE

Charles Keene College in Leicester is running a range of sound engineering courses, commencing in September. The college will be offering: City & Guilds 1820 Sound Engineering parts I and II; City & Guilds 1820 Sound Engineering part III; BSC Audio Technology Year 0; and a Sound & Electronic Music Recording evening course. All the courses are a year in length, apart from the evening course, which runs for two hours a week over 28 weeks.

A Sector of Technology, Charles Keene College, Painter Street, Leicester LE1 3WA.
T 0116 251 6037.
F 0116 253 6553.

MUSIC TECHNOLOGY AT NEWHAM COLLEGE

Newham College of Further Education's music technology department is continuing its policy of engaging leading figures in the industry to deliver key lectures relating to their field.

Engineer and programmer Ben Hillier, who has worked with Oakenfold and Osborne, U2, Curve, Crustacean (as producer) and Suede, recently discussed contemporary production techniques and his experiences in the industry with students on the new HNC course.

Newham now offers education and training at foundation, BTEC National and HNC levels and has a well-equipped and up-to-date facility — two production suites house analogue and digital multitracks, multi-effects, synths, samplers and loads of MIDI gear, with plenty of fully-packed Macs on site. Interestingly, students are active outside the college, with a number running club nights and small labels, and one or two major label signings.

A Newham College of Further Education, Stratford Campus, Welfare Road, London E15 4HT.
T 0181 257 4000.
F 0181 257 4600.

CTS update

Due to a strange blip in cyberspace, our feature on CTS Professional Sales in March's issue unfortunately contained a couple of inaccuracies. CTS's current title is Creative Technical Systems (not Services) as reported, and the number of Carlsbro retail shops was actually 10, not 12 as suggested. Although we correctly stated that CTS were British Standards approved, we omitted to include the fact that they are also ISO9000 certified, something that not everyone in the business can claim by any means. Finally, CTS Pro is based in Kirkby-in-Ashfield, near Mansfield, rather than Ashfield, which is a neighbouring district. However, the correct address was printed at the end of the article, and if you want to visit, they'll be happy to help you out with directions. We're glad to clear these few points up, and hope they didn't cause any confusion. As you might have gathered from the piece, we were more than impressed by their professionalism, and if you're within driving distance, they're well worth a visit.

A CTS Professional Sales, Greenwood House, Unity Road, Lowmoor Road Industrial Estate, Kirkby-in-Ashfield, Notts NG17 7LE.
T 01623 720777.
F 01623 720666.
E 106136.3446@compuserve.com

Midiman UK are now UK distributor for Friendchip's digital audio matrices, the Digimax and Digimax Pro. Both units allow users to centralise their equipment's digital audio streams in a similar manner to an audio patchbay, although unlike a patchbay (and like a MIDI Thru box), one digital input can be distributed to several outputs. At £349, the basic Digimax offers six coaxial and two optical S/PDIF ins and outs, with routing for eight sources and destinations; AES/EBU-equipped hardware can be connected with adaptor cables. Patches can be stored in eight memories and MIDI provides full remote control. The Digimax Pro (£549) offers six XLR (AES/EBU) and two optical inputs, with similar patching facilities and memories to the cheaper machine; S/PDIF equipment can be connected using adaptor cables.
T Midiman UK 01205 290680.

Cave Productions is a new Liverpool-based mobile digital recording service; a Power Mac running an 8-track record/16-track playback Digidesign Pro Tools 3 digital recording/editing system forms the heart of the compact studio, with other tools including Emagic's *Logic Audio*, Digidesign's *Sound Designer II*, Digidesign's 882 8-channel digital interface, Alesis monitoring, Tascam DA30 DAT and a Yamaha CD102 CD recorder.
T 0151 284 9378.

London's Battery Studios have recently taken delivery of a pair of Spendor SA200 active nearfield monitors. Studio manager Bob Mallett notes: "We warmed to the SA200s immediately — their accuracy and transparency make them ideal for critical reference work, and they handle transients exceptionally well."
T TL Audio 01462 490600.

The Human League have installed an Otari Radar digital hard disk recorder in their Sheffield studio. Ian Stanley, producer of the group's last album (*Octopus*) suggested the system; the League's Phil Oakey was so "impressed by its speed and ease of use" that he went for it. Incidentally, the band's next album is due out early this year.
T Stirling Audio 0171 625 6070.

Voyetra & Turtle Beach: perfectly PC

PC specialists Voyetra Technologies and Turtle Beach Systems recently announced that they've signed a definitive agreement merging the companies into a new entity — to be called Voyetra Technologies Inc. (VTI). VTI will continue to specialise in the development and distribution of music and audio software for the Windows platform, taking advantage of Turtle Beach's hardware expertise to develop digital audio and music synthesis peripherals. Rather than compete with mass-market soundcard makers, VTI intend to deliver integrated "audiophile-grade" software and hardware products for multimedia PCs. Information on the merger can be obtained from both company's web sites, http://www.voyetra.com or http://www.tbeach.com.

Les Bradley, the man responsible for designing the Mellotron, died of cancer on January 14, just days before his 81st birthday.

It was in 1963 that Les formed Mellotronics Ltd and

Les Bradley

Les Bradley, centre, with Martin Smith, left, and son John Bradley.

built the first Mellotron, the keyboard instrument which was able to reproduce musical sounds and effects by activating tape loops, and as such was the analogue forerunner of the sampler. This was followed a year later by the Mark II, the definitive '60s version which flavoured many of the psychedelic era's classics, including the Beatles' 'Strawberry Fields Forever'.

Ironically, it was the growth of digital sampling which led to the demise of this amzing instrument, in 1986, by which time it had evolved into the Novatron. However, the 1990s have seen a major Mellotron revival, thanks to a number of artists, including Oasis and Paul Weller, who have coloured their latest albums with the instrument's grainy textures.

Despite the tragedy, Les's son John, and Martin Smith, who recently formed the Mellotron Archives to service existing machines, are delighted that Les was able to witness the renewed interest in his innovation. "Les was so excited by this new period of growth," said Martin. "He never lost his boyish enthusiasm and was still designing equipment just weeks before he died."

Unknown to me at the time, Les was suffering from the early stages of his cancer when I met and interviewed him for my *Good Vibrations* book in the summer of 1994. My overriding memory of that afternoon was his utter disbelief that, in today's hi-tech environment, a new generation of musicians had suddenly taken his 30-year-old invention to their hearts. "I suppose we must have got something right," he told me. A grand understatement if ever I heard one. *Mark Cunningham (SOS ran a feature on the Mellotron and the Mellotron Archives back in June 1993; the Archives can be reached on 01889 504211.)*

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workshop corner

TL Audio are embarking on a series of in-store workshops at selected pro audio dealers around the UK, where potential customers can benefit from working demos of processors from the Classic, Indigo and Crimson ranges (monitored through Spendor SA-series monitors). *SOS*'s own Demo Doctor John Harris, an experienced engineer, will be on hand during the demos, along with TL Audio personnel, who will be able to handle any queries regarding the processors or Spendor monitoring. The seminars will take place between 11am and 4pm at four branches of Music Village/Digital Village: March 29, Digital Village, Barnet; April 5, Music Village, Chadwell Heath; April 12, Music Village, Cambridge; April 19, Music Village, Croydon. Attendees will be eligible to enter a free draw for an Indigo 2021 compressor.

> **A** TL Audio, Letchworth, Herts SG6 1AN.
> **T** 01462 490600.
> **F** 01462 490700.
> **T** Digital Village 0181 440 3440.

Korg UK are also running a series of seminars at the Music Village/Digital Village chain of shops. Korg's Trinity series of workstations and the brand-new Soundlink DRS recording system, based around the new 1212 PCI multi-channel audio card (which comes bundled with Macromedia's *Deck II* audio software), will all be put through their paces. Times are once again 11am to 4pm, and take place as follows: April 5, Digital Village, Barnet; April 12, Music Village, Chadwell Heath; April 19, Music Village, Cambridge; April 26, Digital Village, South Croydon. Korg are also running a competition, with a chance to win a Trinity PBS option plus a full set of disks, together with Steinberg's *Cubase VST*, which, coincidentally, works with the Korg 1212 PCI card.

> **A** Korg UK Ltd, 9 Newmarket Road, Kingston, Milton Keynes MK10 0AU.
> **T** 01908 857100.
> **F** 01908 857199.
> **T** Digital Village 0181 440 3440.

If you're confused by the many choices of software and platform currently available for computer-based notation, check out Turnkey's notation seminar on April 10. The shop will be giving customers a chance to compare several different software packages, including *Sibelius 7* v3.0 running on an Acorn RISC PC computer, Passport's *Encore* v4.0 on Mac and PC, and Steinberg's *Cubase Score* v3.0, also for Mac and PC. Guest speakers from the software companies will be available, and refreshments will also be provided. The action starts at 6.30pm, and tickets are free.

> **A** Turnkey, 114-116 Charing Cross Road, London.
> **T** 0171 379 5148.
> **F** 0171 379 0093.
> **E** sales@turnkey.demon.co.uk
> **W** http://www.turnkey.uk.com

Sound Technology, in conjunction with Emagic, will be staging a UK tour to promote the new AudioWerk 8 PCI audio card and the full range of Emagic software in April. Starting on April 7, the

Audiowerk8

tour will take in 11 venues, including the Liverpool Institute of Performing Arts. Taking part in the tour will be Phil Jackson from Emagic US, who is the company's head international demonstrator. Full details of venues and dates can be obtained from Sound Technology's web site, or by giving them a call.

> **A** Sound Technology, Letchworth Point, Letchworth, Hertfordshire SG6 1ND.
> **T** 01462 480000.
> **F** 01462 480800.
> **W** http://www.soundtech.co.uk

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From Yamaha, the world's leading piano maker, comes the P50-m piano module. 28 brilliant piano voices, based on our P-Series digital pianos, all in a half rack unit. It's as easy to use as falling off a stool. And covers all the classic electric and acoustic piano sounds from clav's to stereo grands. With 32-note polyphony, 6MB of waveform ROM, on-board DSP plus an intuitive EQ section, the P50-m is in a class of its own. And at a suggested selling price of just £349, there's no better way of getting hold of truly great piano sounds. Call 01908 369269 to find out more about the P50-m, or to request a free copy of our demo CD-ROM.

P50-m **YAMAHA**

Yamaha-Kemble Music (UK) Ltd

shape of things to come

Short Shark Shock

The American music publishing business is presently engaged in a legal battle that could result in the copyright for every new song written being claimed by a company called Pre-Data Enterprises. Pre-Data claim that they've come up with an algorithm that can produce one-minute music files of every melody that it is possible to write, based on the possible permuations of notes, scales and keys that exist in western music. In fact, because of the huge number of permuations involved, the program takes almost a day to run, even on a fast mainframe, but the legal argument hinges on Shark's claim that if the algorithm can be proven to be viable, all they have to do is register the algorithm itself for copyright purposes, and all future compositions based on musical elements or sequences less than one minute in length will belong to them. If this succeeds in the USA, it is expected to go through uncontested in the rest of the world within six months. Watch this space for updates as they happen.

Neato show you where to stick it!

CD-labelling specialists NEATO have launched an enhanced software package called *CD Face*. It's a new stand-alone system that features a series of embedded graphic images relating to travel, business and audio; these images can be incorporated into any individual label or jewel case design. *CD Face* is an addition to NEATO's existing kit, which includes label templates, jewel case software, a selection of A4 label sheets, jewel case inserts and the NEATO label applicator. The original NEATO CD labeller kit has been upgraded to include software featuring curved text and an assortment of A4-sized CD label sheets in various colours. Another new product that's compatible with the NEATO range is the Jewel Case Pac, which allows you to design and produce a four-page booklet and tray liner with spine index designs; the relevant blank card materials for creating jewel case inserts are also included in the kit.

- NEATO, Ealing House, 33 Hanger Lane, London W5 3HJ.
- 0181 932 9540.
- 0181 932 0480.

Highlights from Frankfurt

The SOS crew report back from the hi-tech village that is the Frankfurt Musikmesse...

The hi-tech music industry is in many ways rather like politics or quantum mechanics — you need to be able to believe several conflicting 'truths' simultaneously in order to make any sense of the whole picture. For example, if you look at where computers are going, it's perfectly obvious that the traditional recording studio is a dead duck, and an expensive dead duck at that.

More companies are building the necessary hardware to get high-quality audio in and out of a computer, Lexicon being the most surprising new entrant in this race, and it seems that Steinberg have set a precedent with their *VST* system that other software companies are certain to follow. Why buy expensive outboard processors and effects when you can create everything you need in software? Already we have Steinberg showing a 'soft' TR808/TB303 sound module, and aside from the convenience, you don't need rack space, cables or a can of spray polish to keep your purchase in perfect condition. Hardware is laughably obsolete — a software-based system never ages, never gets chipped or scratched, and for the price of an upgrade, you can trade up to the latest model whenever you like. The next logical step has to be to include stereo editing and CD-burning facilities within basic audio/MIDI sequencer packages so that the user can go from idea to finished product without ever leaving the environment of the sequencer...

But you only have to look at high-end outboard gear or mixing consoles, and right away it becomes equally clear that software will never replace these beautiful boxes with their textured aluminium front panels, their silky smooth control knobs and their rows of flashing LEDs. Who in their right mind would want to exchange all this controllability and beauty for an on-screen fake that you have to control with a mouse? After all, you can't show off a floppy disk to your friends or clients. No, a real studio means a big mixer with loads of knobs, a huge rack of outboard and discrete tape or disk recorders. And at least half of it must be analogue, otherwise where will the magic come from? Talking of magic, Groove Tubes, the company famous for valves and valve mics, have added a solid-state mic to their range, and in one rather sad corner of Hall 9.1, a valve designer proudly showed us his all-tube processors, that were so good they could actually emulate a solid-state sound! Perhaps the late '90s will be remembered as the era of trying to make one type of technology sound like another.

Another taste of retro came from C-Lab, who have an inexpensive Atari emulation card designed to allow users of Atari sequencers such as *Creator* and *Notator* to run their software on a PC. It's surprising how many users still prefer the pattern-based approach of these packages to the newer, ostensibly more powerful linear-arrangement sequencers.

And then there were the hardware synths. While it is possible to put a couple of synths, a sampler and a hard disk recorder on a sub-£200 sound card, there's something about the real thing that is irresistible. This year there were even more analogue-style synths, and within stone-throwing distance of each other were the new Access Virus, Clavia's Nord Modular synth, Novation's Super BassStation and Quasimidi's Polymorph. The underlying technology may differ, but the common factor of real knobs remains. There were also mock-ups of forthcoming models, including the Quasimidi Nucleus keyboard and Novation's SuperNova polyphonic analogue synth.

However, the star attraction for keyboard players was undoubtedly ▶

Frankfurt news

Korg's Z1, a DSP-based spin-off from the OASYS programme using Korg's own MOSS (gathers no rolling stones?), tone generation. The DSP oscillators are based upon 13 different algorithms, and the basic 12-voice polyphony can be expanded to 18 voices.

Emu's new electronic drum, being referred to tentatively as the Thunder, and based on a concept by Don Buchla, was also a real eye-opener, largely due to an inspired demo by Dave Bristow. Essentially, the instrument is a single drum fitted with a conventional head marked into sections. Optical sensors behind the head detect the position and degree of head deflection, and the idea is to play the different zones with the fingers, to combine melodic and percussive ideas. Notes can be sustained by pushing the head down, and you can even slide a finger across the head to get pitch bend.

If you moved into the guitar section of the Messe, you could be forgiven for thinking that recording is entirely irrelevant, by whatever means. But look a little deeper and you'll find that even the guitarist can't escape from technology: the Line 6 Physical Modelling guitar amplifier has been joined by guitar combos with integrated effects from both ART and DOD. What's more, it's rumoured that a number of top-end studio equipment companies are interested in the guitar market — we've heard from more than one source that TC Electronic have something up their corporate sleeves other than their corporate arms.

That's just about all I've got room for here, but I think a lot will happen over the course of the next few months. Look out in particular for Sony becoming a bigger player in the recording market, look for more products, including low-cost computer cards, that support the ADAT interface, and expect new performance controllers to appear. *Paul White*

Korg

One of the highlights of the show was the premiere of Korg's new DSP-based instrument, the Z1. Using a version of Korg's MOSS (Multi-Oscillator Synthesis System) introduced by the Prophecy, the Z1 provides you with more of everything: a 61-note velocity and aftertouch-sensitive keyboard, 12-voice polyphony (expandable to 18), up to six-part multitimbrality and a polyphonic, MIDI-syncable arpeggiator. There are 13 types of oscillator algorithm on board, with two oscillators available simultaneously; synthesis and imitative models are provided. Two filters are available per voice, from a choice of five, and a range of global and insertion effects plus two-band EQ, are also on offer. The large graphic display helps when it comes to editing, as does a sizeable collection of front-panel knobs; five of them are designated Performance Editor knobs, and these join the pitch and mod wheels, the new new XY vector touchpad and dedicated filter and amp EG controllers. It's also possible to upgrade the Z1's outputs with an optional ADAT optical digital interface.

We were impressed by John Bowen's entertaining demo, which showed off the Z1's potential to excellent effect — what the filters are capable of is scary! *Derek Johnson*

T Korg UK 01908 857150.

Access

The late 90s is certainly a golden age if you're interested in new synthesizers; all manner of designs based on classic analogue electronics, DSP-based simulations, and plain garden variety sample + synthesis instruments are hitting the marketplace and tempting your wallet. New from Access, the company behind the Gekko range of MIDI data processors and Access Matrix 1000 and MicroWave programmers, have announced the Virus DSP-based synth module. This 12-voice instrument has been endowed with "extremely warm analogue sound characteristics", and offers two oscillators, one sub-oscillator and noise generator per voice. In addition to sawtooth and variable pulse waves, the oscillators have 64 spectral waveshapes. Other facilities include oscillator sync and FM, two independent two-pole filters, four filter routing options (serial 24dB, parallel, oscillator split, noise split), three independent LFOs per voice, modulation, delay and reverb effects, six outs, two audio ins (for mono and stereo processing), and complete MIDI control. *Derek Johnson*

T Turnkey 0171 379 5148.

Event

The recent NAMM show saw the first inklings of a move towards cheaper PCI audio cards, for PowerMacs and suitably equipped PC clones. At Frankfurt we saw two cards from Event Electronics, the company behind the 20/20 monitors (reviewed in July '96). The more expensive Layla card/breakout box combination (featured briefly in our NAMM report) offers the latest-generation Motorola DSP chip, running at 80MIPS, and provides eight balanced jack inputs, 10 balanced jack outputs, S/PDIF I/O, word clock I/O, MIDI In, Out and Thru and variable sample rates from 5kHz to 50kHz. The convertors are 20-bit, with internal 24-bit resolution; the digital I/O offers up to 24-bit resolution.

If your demands are not so great, and your pocket not so deep, the forthcoming DARla, which aims to retail for a pretty amazing £299 in the UK, may fit the bill. Based around similar technology to Layla, the new card runs slightly more slowly and offers more limited input and output connections — two input jacks, and eight output jacks via an external RCA breakout box. Sample rate is again variable between 5kHz to 50kHz, and the convertors are also 20-bit.

Back on the speaker front, Event gave use a very nice demo of the Tria tri-amped nearfield monitoring system, designed for use in "more intimate recording and production environments, where space is limited". The system consists of a floor-mounted unit (which houses amps, active crossovers and a very low-frequency driver) and two satellite speakers housing mid-range drivers and tweeters. Lastly, Event also showed us a highly attractive and well-designed miniature mic preamp, called the EMP1. *Derek Johnson*

T Key Audio 01245 344001.

NEW AT FRANKFURT

Here's a list of new products from this year's Messe (although products that have already been mentioned in the regular SOS news pages have not been included). Apologies to anyone we missed!

MANUFACTURER	PRODUCT NAME	DESCRIPTION	FURTHER INFO FROM...
ACCESS	Virus	Knob-laden analogue-emulation rackmount synth	Turnkey 0171 379 5148
AKAI	DPS12	12-track digital recorder	Akai UK 0181 897 6388
AKAI	S20	Real-time performance sampler	
ART	Acoustic	Acoustic guitar preamp/effects	Key Audio Systems 01245 344001
ART	Phat Boy	Personal bass preamp/effects	
ART	Pro VLA	2-channel valve compressor/limiter/amplifier	
ART	Quadra FX	Multi-effects	
AUDIO TECHNICA	ATM89R	Hand-held condenser mic	Audio Technica 0113 277 1441
AUDIX	Mini Series	Compact, multi-purpose monitors	SCV London 0171 923 1892
AUDIX	Nile Series	Professional nearfield active monitors	
AUDIX	Studio Series	Studio monitors	
BEHRINGER	Magician T1950	8-channel valve interface	Behringer UK 01483 458877
BEHRINGER	Tube Composer T1952	Tube compressor/expander/gate/limiter	
BEHRINGER	Tube Ultra T1951	Stereo 4-band parametric EQ	
BEHRINGER	Ultracon SRC2000	"Digital Swiss Army Knife"	
BEHRINGER	Ultra-Dyne DSP9000	Digital mainframe	
BEHRINGER	Tube Ultra-Gain T1953	Stereo mic preamp/line-level conditioner	
BEHRINGER	Tube Ultrafex T1954	Tube enhancer/exciter	
BEHRINGER	Virtualizer DSP1000	Multi-effects	
C-LAB	Stratos	ST-compatible ISA-buss card for PCs	Digital Media 0468 685552
C-LAB	Time Machine	Universal clock converter	
CLAVIA	Nord Modular	Virtual analogue modular synth with software front-end	Key Audio Systems 01245 344001
CREAMWARE	Firewalkers	Eight real-time processing plug-ins for TDAT system	Et Cetera Distribution 01706 228039/Creamware UK 01428 724594
CREAMWARE	Osiris	Real-time audio restoration plug-in for TDAT system	
CREAMWARE	TDAT 16	PCI-based DSP audio recording system	
DBX	266a	Compressor/gate	Arbiter Music Technology 0181 202 1199
DBX	286a	Mic preamp/processor	
DRAWMER	MX30	Gated compressor/limiter	Drawmer Distribution 01924 378669
EMAGIC	Logic Audio v3	PC/Mac MIDI + Audio sequencer, now with built-in effects	Sound Technology 01462 480000
EMU	Carnaval	Latin sound module	Emu UK 0131 653 6556
EMU/BUCHLA	"Thunder"	Percussion controller	
EVENT	DARla	Cross-platform PCI audio recording card	Key Audio Systems 01245 344001
EVENT	EMP1	Compact mic preamp	
EVENT	Tria	Active workstation monitor system	
FAR	CR10A	Powered versions of CR10 nearfield monitors	Axis Audio Systems 0161 474 7626
FOCUSRITE	"Green 4"	2-channel compressor/limiter	Focusrite 01628 819456
FOCUSRITE	"Green 5"	Full-function channel strip	
FOSTEX	D90	8-track hard disk recorder	SCV London 0171 923 1892
FOSTEX	D160	16-track hard disk recorder with eight additional 'ghost' tracks	
FOSTEX	MN04 Tetramix	Mini-mixer	
FOSTEX	MN12	12-input mini-mixer	
FOSTEX	X14	Compact cassette 4-track 'sketchpad'	
GEM	RealPiano	Half-rack, 64-note polyphonic digital piano module	Key Audio Systems 01245 344001
GEM	Pro 1	Weighted keyboard version of above with controller features	
GROOVE TUBES	Model 5SC	FET condenser mic	Axis Audio Systems 0161 474 7626
GROOVE TUBES	Model 6TM	Valve condenser mic	
KAWAI	K5000S and K5000R	Synth and rackmount versions of the K5000 workstation	Kawai Europa 0049 2151 37300
KORG	SG ProX	Digital piano/controller keyboard	Korg UK 01908 857150
KORG	Toneworks AM2000	Simple dedicated 1U rack reverb unit	
KORG	Toneworks DLR2000	Simple dedicated 1U rack delay unit	
KORG	Z1	DSP-based multi-oscillator synth	
LA AUDIO	Millennium EQX2	Dual 3-band parametric EQ	SCV London 0171 923 1892
LA AUDIO	Millennium MLX2	Dual mic/line preamp with DI	
LA AUDIO	Millenium MPX1	Multi-processor/voice channel	
LEXICON	Studio	PCI-based DSP audio recording system	Stirling Audio 0171 624 6000
JOE MEEK	VC2	Tube Channel	Sound Valley Distribution 01494 434738
JOE MEEK	VC4	Stereo enhancer	
NOVATION	Super BassStation	Enhanced BassStation rack synth	Novation 01628 822868
NOVATION	Supernova	Polyphonic rack synth and keyboard synth	
NTI	Various	Range of American parametric EQs and mic preamps	Sound Valley Distribution 01494 434738
OBERHEIM	GM400	Digital guitar processor	MC MXCIX 0171 723 7221
OBERHEIM	GM1000	Digital guitar processor	
OBERHEIM	MC3000	Master MIDI controller keyboard	
OBERHEIM	MiniGrand	Digital piano expander	
OBERHEIM	OB3 Squared	Digital drawbar organ module and keyboard	
PRESONUS	ACP2+	Dual compressor/gate	Music Connections Chelsea 0171 731 5993
PRESONUS	Blue Max	Intelligent compressor/limiter	
QUASIMIDI	Nucleus	Polyphonic keyboard synth with knobular user interface	Turnkey 0171 379 5148
QUASIMIDI	Polymorph	Rackmounting, analogue-emulation polysynth	
QUASIMIDI	Variator	Pattern-based, dance-orientated synth	
ROLAND	A33	Controller keyboard	Roland UK 01792 515020
SOUND LAB	Promix 01 Digikit	Upgrade for Yamaha ProMix 01 mixer	Digital Media 0468 685552
SCV	Di2	Active DI box	SCV London 0171 923 1892
SCV	DiP	Passive DI box	
SONORUS	STUDI/O	PCI I/O card with two digital 8-channel ADAT interfaces	Sonorus 001 212 253 7700
SONY	SMS2P	Active studio monitors	HHB 0181 962 5000
SPECTRAL AUDIO	Syntrack	Digital rackmount synth with analogue filter	Music Connections Chelsea 0171 731 5993
SPIRIT	Folio Portapad	10-input battery-powered mixer	Spirit by Soundcraft 01707 665000
SPIRIT	Folio Powerpad	10-input powered mixer	
SPIRIT	XL7	24-channel live/recording mixer	
SPL	Machine Head	Digital tape saturation processor in the new Digital Red range	Beyerdynamic GB 01444 258258
SPL	Loudness Maximizer	Digital dynamics processor (Digital Red range)	
SPL	Spectralizer	Digital harmonics processor (Digital Red range)	
SPL	Dynamaxx	Compressor/expander/noise gate (Analogue Blue range)	
SPL	Charisma	Cut-down, 2-channel version of the 8-channel valve mic preamp	
STEINBERG	Cubase VST v3.5	MIDI + Audio software with improved built-in effects	Harman Audio 0181 207 5050
STEINBERG	RB338	Software emulation of Roland TB303/TR808/TR909	
VESTAX	MX1	MIDI control surface	Vestax Europe 01428 653117
VESTAX	SL201 MkII	Dual compressor/limiter	
WAVES	Renaissance Compressor	First of the Renaissance series of sound processing plug-ins	Natural Audio 0181 207 1717
WAVES	WaveConvert Pro	Batch file processing and sample-rate conversion application	
WAVES	MultiRack v1.2	Plug-in and applications bundle for Macs with DSP card	
WAVES	v2.3 plug-ins	New versions of Waves DSP plug-ins	
WILL SYSTEMS	MAB303	Half-rack MIDI-controllable TB303 clone synth	UK distribution yet to be arranged
YAMAHA	E drum	MIDI drum pad system including GM drum module	Yamaha 01908 369269
YAMAHA	MU90R	Updated MU80 sound module in a rack package	
YAMAHA	QY70	New QY portable sequencer	
YAMAHA	VL7 v2	Enhanced VL7 physical modelling synth	

Table compiled by
Debbie Poyser and Matt Bell

Frankfurt news

Fostex

The D90 multitrack removable hard disk recorder from Fostex extends the facilities of the popular D80 to include an ADAT

interface, allowing not only easy uploading of ADAT material for editing, but also near real-time backup to this economical medium. The D90 also offers +/-6 percent varipitch without loss of audio quality, allowing the unit to be

course, to act as the master sync machine and for all backups and transfers.

The D160 expands the concept still further, offering 16 tracks, plus a further eight 'ghost' tracks for alternate takes. The D160 is the first unit to feature Fostex's FDMS3 disk management system to maximise recording time, allowing up to 240 minutes of mono recording on a 1.3Gb drive. ADAT and SCSI2 interfaces are included to offer fast backup and restore, with optional boards for LTC (SMPTE/EBU linear

accurately synchronised to other devices via MTC (MIDI Time Code). The D80 is not made obsolete by the new machine, however, for it makes an ideal expander unit for larger systems — you only need one D90, of

timecode) and balanced signal I/O.

All the Fostex range of multitrack hard disk recorders feature uncompressed, 16-bit linear digital audio. *Dave Lockwood*

T SCV 0171 923 1892.

Quasimidi

German company Quasimidi have finalised their UK distribution arrangements with Turnkey — which means that the UK will finally get to try out the 309 Rave-O-Lution. We did, and it's good!

Also forthcoming from Quasimidi are the Polymorph analogue synth/analogue sequencer combination and the Nucleus keyboard. The Polymorph features an 8-voice polyphonic 'virtual analogue' emulation of analogue synthesis and a 128-step programmable analogue-style sequencer. Further Polymorph highlights include three independent oscillators per voice, plus oscillator sync; each oscillator has its own pitch envelope generator. On the filter front, there are 12dB high-pass resonant and 24dB/12dB low-pass resonant filters, each

with its own individual envelope. The filters offer resonance into self-oscillation, and may be switched in serial or parallel, to give band-pass and band-reject response. The Polymorph's third oscillator also gives you more potential for creating fatter, more searing sounds than can be achieved on synths with two oscillators. Quasimidi are proud of the Polymorph's programming interface, which, on first impression, seems pretty user-friendly. There are 128 user memories, and the synth is also four-part multitimbral (with four separate audio outs); a choice of flanger, chorus, delay and other effects combinations is available.

The Nucleus keyboard will essentially offer a pair of Polymorphs in a knob-laden (84 in total), 61-note keyboard. Polyphony is doubled to 16 notes, although multitimbrality remains at four parts. In addition to the Polymorph's 'morphing sequencer', the Nucleus offers a fully-featured arpeggiator. And don't forget: both synths are under full MIDI control. *Derek Johnson & Matt Bell*

T Turnkey 0171 379 5148.

Lexicon

While the NAMM show saw a number of companies announcing low-cost digital 'breakout box' cards for users of computer-based digital recording systems, Frankfurt saw Lexicon stepping in at a rather higher level, with a 20-bit modular system based on the 24-bit

Studio Engine PCI card, a choice of two interfaces, and a PC90 daughterboard, the latter putting the full power of the PCM90 reverb inside a desktop system. Lexicon's Studio system is designed to provide I/O, DSP, signal routing, sync and control to complement major audio and audio sequencer packages. A single core card can support up to 44 simultaneous input/output sources and can sync using LTC in or ADAT sync, as well as providing a master system clock.

The simplest interface is the LDI-12T, supporting 2-in, 2-out 20-bit analogue signals, plus eight channels of ADAT I/O and S/PDIF. The larger LDI-16S is a 16-channel interface comprising eight analogue channels and eight TDIF (Tascam DA88) channels. Optional ADAT interfacing is available, along with a Post option enabling the system to support LTC, VITC, windowburn, house sync in, and GPI for external triggering. A second I/O unit may be added if more I/O channels are needed. Currently, the system is compatible with *Cubase VST*, but other alliances are expected to be announced before the system ships later in the year. *Paul White*

T Stirling Audio Systems 0171 624 6000.

Emu
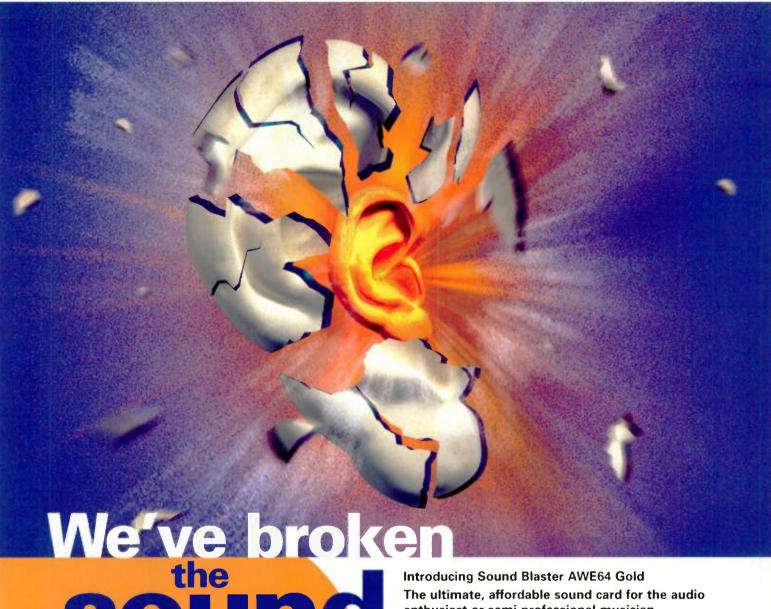
In their 25th anniversary year, Emu's diversification, typified by the recent acquisition of drum controller specialists KAT, continues apace. The company have announced a range of product co-developments with synth pioneer Don Buchla. First off the blocks is a percussion controller/sound module combination. We saw a demo of an early version, going by the name of Thunder, and it was quite impressive, based on a real drum shell and a real drum head, with optical sensors inside the shell to sense the position, movement and velocity of your hands or fingers and translate them into MIDI data. The finished product will come bundled with a brain that includes an integral sound module, based on Emu's Orbit. New from the standard Emu stable is the Carnaval Latin sound module, which joins the family currently populated by Planet Phatt and Orbit v2. In common with these other modules, Carnaval's 'Beats' mode allows the user to create MIDI-clocked rhythm parts. *Derek Johnson*

T Emu UK 0131 653 6556.

Frankfurt news

SPL

SPL, renowned for their signal-enhancement products such as the Vitalizer, have now launched a dynamics processor. The DynaMaxx Compressor De-Compressor Auto Noise Gate is designed to be simple to operate without compromising its effectiveness, and also introduces the concept of De-Compression. Attack and release are automatically adapted to the input signal, leaving the user with just Compress and Gain controls to set. This makes the unit much easier to set up, and ensures that compressor performance remains optimised regardless of how the program content changes. Although program-adjusted parameters are normally set to minimise audible side effects, the DynaMaxx offers an alternative, Effect Comp mode to speed up both attack and release for a bit of creative dynamic modulation, where appropriate. The unit's Soft Limit mode offers, effectively, a limiter with a soft-knee characteristic (ie. the ratio softens as the signal level decreases from full limiting).

In its De-Compress mode, DynaMaxx inverts the compressor function to attempt to restore over-processed or lifeless material — the sound is said to gain "new dynamics and vitality". The function set is completed by a noise gate, with auto-release, optimised for "click free gating at the start and end of a song when mixing and mastering". The choice of VCA is claimed to offer less side effects and distortion, allowing high compression ratios to be used without affecting top-end detail.

SPL also announced a third unit in their Red series of digital processors, the Machine Head, designed to simulate analogue tape saturation effects in a digital signal path. Overloading analogue tape produces compression and a warmer sound as the tape saturates at HF — the unit even incorporates a tape speed switch to replicate the characteristic responses of 15 and 30ips!

The dual-channel Charisma valve saturation processor sees SPL offering a more economical version of the eight-channel model and could prove a popular option among those who don't need to process more than two signals simultaneously. *Dave Lockwood*

**T Beyerdynamic
01444 258 258.**

Presonus

Presonus, the company that brought you the ACP8 dynamics package and DCP8 digitally-controlled-analogue automation and dynamics unit (reviewed in December 1996 *SOS*), announced the Blue Max, claimed to be "the world's first and only full-featured smart compressor/limiter". Blue Max introduces the concept of the preset compressor, with 15 "studio proven" settings, named by application. Thus you get three vocal, two percussion, three fretted instrument, three keyboard, two stereo mix, and two special effects presets. A further Manual mode with a full complement of Attack, Release and Ratio controls allow the user to dial up precisely tailored settings where necessary.

Anyone tempted to bemoan the intrusion of the preset mentality into even this part of the recording process has obviously not heard just how much damage a badly adjusted compressor can do a signal! The Blue Max looks as though it will be able to give people the effect they want with the minimum of fuss and the advantage of being consistently repeatable.

An internal power supply, and the inclusion of side-chain signal access prove that this is a serious piece of kit, not a novelty. *Dave Lockwood*

**T Music Connections
0171 736 4771.**

Beyer MCE84

Back-electret Capacitor Mic

A new back-electret mic that doesn't need phantom power; HUGH ROBJOHNS won't be calling the ghostbusters...

Beyer have a fine and long-standing reputation in the design and manufacture of microphones to suit all purposes and budgets, and their new microphone, the MCE84, is designed to meet the needs of the semi-professional user who might not have access to a phantom power supply, from a low-cost mixer or portable DAT recorder. A general-purpose back-electret capacitor microphone, the MCE84 is essentially identical to the earlier MCE83 — the only real difference being that the latter could only be phantom-powered, whereas the newer model can also be powered from an internal AA battery.

HOW IT LOOKS

The new mic is supplied with a stand adaptor, and a clip of pliable rubber that's likely to survive much longer than the common brittle plastic types. The microphone bracket is pivoted to the stand adaptor; although the review model was commendably stiff, there is no screw or other tension adjustment if the bracket eventually becomes loose through heavy use.

The stand adaptor is fitted with a removable threaded metal bush to convert the clip's internal (plastic) thread of ⅝ inch down to the standard ⅜-inch thread. Unfortunately, this metal bush has a screwdriver slot cut only across one end, and if it should be carelessly inserted the wrong way into the plastic clip, I fear it might never be removed again. The review model wasn't supplied with a foam windshield, although this is available as an optional accessory; it was equipped with an alkaline AA battery and carrying case, however.

The microphone itself is 205mm long and 25mm in diameter, with a standard 3-pin XLR plug installed in its base. The body appears to be made of brass and is finished in a matt black paint, with a label at its base describing the microphone's model and serial number. The business end features six rows of slots cut into the body and a chromed wire mesh across the end cap which, together with the closed-cell foam lining, forms an effective pop shield.

Halfway up the body of the microphone is a three-position switch which is operative only if the AA battery is installed; this is labelled 'ON', 'BC' (battery check) and 'OFF' — the battery check position illuminates a small red LED above the switch if the battery is in good condition. The lower third of the microphone body may be unscrewed to reveal the battery compartment, but there's nothing to retain the sleeve once it's unscrewed.

HOW IT SOUNDS

The MCE84 works perfectly well with either the AA battery or external phantom power, and there didn't appear to be any conflict if the battery was left in when phantom power was applied. Unfortunately, the review model was not supplied with any operating instructions, and I wasn't able to establish whether external phantom power or the internal battery took precedence if both were available.

The microphone has a broad frequency response (quoted as 40Hz-20kHz) and is claimed to be able to handle signals levels of up to 138dBA SPL. It's also claimed to have a cardioid polar response, but the large number of slots on the microphone's body would suggest a rather narrower response than that: in practice, I found the microphone had a pretty tight pick-up pattern, more along the lines of a hyper- or super-cardioid. Compared with the frontal axis, sensitivity is considerably lower at 90° incidence — maybe as much as 12dB. Like all highly directional microphones, the MCE84 suffers from handling noise and any mechanical vibrations reaching the body are quickly transferred to the capsule itself. The clip was not spectacularly good at minimising stand-born vibrations, but was adequate for the purpose.
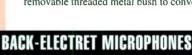
CONCLUSION

The wide frequency response and tight polar pattern of the MCE84 make it well suited to almost any application, whether in the studio or on stage. I wouldn't favour it for vocal work, but found it to be a very capable performer on acoustic guitar; it also worked well as an overhead microphone on drum kits and on hi-hats, where its narrow pick-up was especially handy at rejecting spill from the snare drum.

All in all, an affordable, good-quality, flexible general-purpose instrumental microphone. **SOS**

BACK-ELECTRET MICROPHONES

The MCE84's capsule is of the back-electret variety, meaning that it is polarised during manufacture, and the only requirement for power is to supply the internal head-amplifier. Although back-electret microphones offer comparable performance to their true capacitor microphone siblings, they are also considerably cheaper. The disadvantage is a limited working life, because the pre-polarised capsule dielectric gradually loses its static charge (normally over a timespan measured in tens of years), resulting in a slow fall in output level and sensitivity with a commensurate increase in noise.

Aardvark Aard

Tape Saturation Emulator

If digital perfection leaves you cold, the Aardscape can lend an analogue quality to your recordings. HUGH ROBJOHNS warms to the idea....

Digital recording technology is now widespread and is rapidly becoming the norm rather than the exception — even in semi-professional and home studios. While digital recording offers some very useful advantages over analogue techniques, such as greater dynamic range, freedom from generation loss, faster access times and a much better performance/cost ratio, some people find that its inherent lack of harmonic distortion lends a rather flat and unexciting quality to recordings — the old argument about 'analogue warmth' versus the 'cool digital' sound.

The Aardscape is a new product from an American company, Aardvark Computer Systems, which has been designed specifically to re-introduce some of that characteristic analogue warmth to any signal.

OUTSIDE

The Aardscape is a single-channel signal processor incorporating a technology called 'True Analogue', which, the manufacturers claim, will "achieve the unique sound-quality of analogue tape recording while preserving the advantage of digital recording". In essence, the unit uses non-linear solid-state circuitry to add odd-harmonic distortion to signals, thus simulating the characteristics of heavily over-driven analogue tape recording.

The Aardscape is a free-standing unit, encased in a steel enclosure with rubber feet and is relatively small: 4cm high, 18cm wide, and 24cm deep. The rear panel has five connectors, and a slide switch to select the appropriate input connection. Audio inputs are catered for with an unbalanced quarter-inch jack socket (-10dBv) and balanced 3-pin XLR (+4dBu). Outputs are simultaneously available on both unbalanced jack socket and balanced XLR, and the final connector on the rear panel is a co-axial low-voltage (16V) AC power socket which interfaces with the supplied plug-top power adapter.

The front panel contains an LED bargraph meter covering a 24dB range; three rotary controls to adjust the input level, output level (labelled Drive), and amount of tape saturation effect (Warmth); two slide switches, and two push buttons — all labelled in yellow on a black background. To the extreme left is a Bypass button with associated red LED and on the extreme right is the power switch with a yellow LED.

ROTARY CONTROLS

The audible effect of the Aardscape depends very heavily on the input signal level, because the process is based on a level-dependent non-linear transfer function. The strongest effects

> ## "The unit does precisely what it is claimed to do — the question is how much you like what it does!"

occur with an input signal peaking towards the top of the 9-step bargraph meter. The output level control optimises the output signal level with the input sensitivity of a recorder or mixing desk. The Warmth control adjusts the amount of the tape saturation effect, but is really provided for fine-tuning, since the overall quality is more dependent on the two slide switches. The first of these, labelled Saturation, alters the type of tape saturation between three presets — Soft, Medium and Hard — mimicking different recording tape characteristics. The second switch, Brilliance, also has three positions, Full, Clean, and Brite (sic), and these extend the upper harmonics, lending an edge or sharpness to the sound quality.

IN USE

Using the unbalanced connectors, I found that the Aardscape worked satisfactorily, although the settings of the input and output level controls were surprisingly critical. The input level affects the quality of signal processing considerably, while incorrect setting of the output control upsets the level matching between processed and bypassed signal paths, making it difficult to judge the benefit of the saturation process.

The unit is also fiddly to set up because of the interaction between controls, and the subtle but audible differences between every switch position. There is no 'ideal' setting, as the most appropriate signal processing is very dependent on the programme material and its position within a mix. In this respect, the Aardscape is much like an equaliser or compressor, and I found using it while tracking gave rather unpredictable results at the mixdown stage.

While I appreciate that the tape saturation

s c a p e

effect the Aardscape is emulating is conventionally achieved by recording very hot signals onto multitrack tape. I think that the unit produces better results if signals are processed at the mixdown stage, when the saturation quality is easier to judge. Perhaps greater experience with the unit would allow appropriate settings to be selected at the track-laying stage, but the user should be aware that excessive use on too many tracks will tend to create a very fatiguing sound and could give the impression of a badly recorded track, rather than an effectively processed one!

The Aardscape certainly adds harmonic distortion to the signal path — a fact made very obvious when you pass a sinusoidal tone through the system. Even at very low input levels (-18 to -24dB on the input meter), the harmonic distortion is quite evident. In bygone days, I would have rejected any analogue tape machine that bent the signal this much at such a low level...

The saturation effect becomes stronger and more obvious with higher input levels, the quality changing with the Saturation switch and Warmth controls. The Aardscape is particularly effective in thickening drums or percussion, but I'm not so keen on its use with vocals or most other harmonically complex instruments. As Aardvark's own handbook states, "Every engineer is different and has their own taste", so it's probably worth testing the Aardscape yourself to make up your own mind about its usefulness in your application. I can confirm that the unit does precisely what it is claimed to do, so the question is how much you like what it does!

QUALITY CONTROLS

The unit was rather less impressive via its balanced connections, as there was a very pronounced increase in electronic noise — to the extent that the unit was unusable in this mode. After checking with the manufacturers, I discovered that the problem was thought to be a fault condition not typical of 'normal' units. However, this was the second sample of the Aardscape I've had for review, and the first was rejected because of similar, but worse, problems. I strongly recommend that before purchasing an Aardscape, you test it very thoroughly, as it seems that quality testing at the factory, or reliability in shipping, may be a problem.

The Aardscape is the kind of product that some users will swear by, while others will find it little more than an interesting diversion. As I mentioned earlier, the whole *raison d'être* of the Aardscape is to add the kind of distortion obtained by overdriving analogue tape — a creative and effective technique on certain instruments or sounds — but one of the key advantages of digital recording (as far as I am concerned) is a freedom from exactly this kind of distortion, allowing a closer fidelity to the sonic characteristics of the original instrumentation. So the usefulness and appropriateness of the Aardscape is very much a personal decision. **SOS**

info

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Rane Paqrat

24-bit Recording Converter

If you can live with losing four tracks on your digital multitrack tape recorder, the Rane Paqrat will allow you to record with up to 24-bit resolution. HUGH ROBJOHNS rates the 'rat.

An increasingly common requirement among the professional recording fraternity is to record with greater dynamic range than conventional 16-bit equipment allows. The supporting argument is that if the domestic replay medium has 16-bit resolution, the origination format should be somewhat better, such that a generous headroom can be allowed during the original recording (to cope with unexpected peaks) while a very low noise floor is maintained. Subsequent post-production and re-mastering to a 16-bit domestic format will therefore not degrade the quality of the material in any

optical disks (from Sony, Genex and Studer, for example); tape-based formats include the Nagra-D, and the latest 24-bit DASH machines from Sony, and then of course there are several digital audio workstation systems. However, all of these options are relatively expensive and so make it hard for the home-studio owner or amateur sound engineer to take advantage of recent improvements in analogue-to-digital conversion technology and pricing.

The ideal solution would be if someone made a unit which could remove the 16-bit restriction of affordable multitrack formats, such as ADAT or DTRS (the Tascam DA88 format also supported by Sony; it stands for Digital Tape Recording System), and allow high-resolution recordings.

PAQRAT

Well, if you've read this far, you will have guessed that such a device is available! The Rane Paqrat encodes a stereo AES-EBU or SPDIF signal, of up to 24 bits per channel, onto four adjacent tracks on the multitrack tape (user selectable between 1 and 4 or 5 and 8), formatting the data so that it conforms with the 16-bit structure of the appropriate ADAT or DTRS tape format.

The idea of trading tracks for resolution is
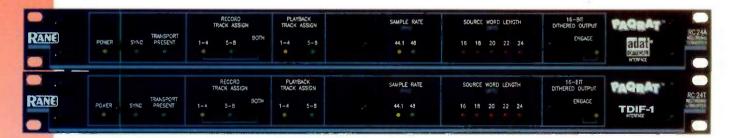
steel box, 21.5cm deep. AES-EBU digital inputs and outputs are provided with standard 3-pin XLR connectors, and a 24-bit SPDIF input is available via a phono socket. Input selection is performed by a push button on the rear panel next to the connectors.

The RC24A version of the Paqrat has a pair of TOS-link-style optical connectors for record and playback links with an ADAT

way, and may actually enhance it if noise-shaped re-dithering systems such as Sony's SBM (Super-Bit-Mapping) or Deutsche Grammophon's 4D processes are used.

The majority of classical recording labels are routinely using 20-bit A/D converters these days and some are using devices with even greater resolution. Although suitable equipment to perform the analogue-digital conversion at 20-bit resolution (or higher) is widely available, there remains a problem over which digital recording format to use. Surprisingly, recording formats offering 20+-bit capability remain quite scarce. There are a couple of devices that use magneto-

not new — other manufacturers have already produced similar products for the professional DASH multitrack machines as well as designs for ADAT and DTRS. However, the Paqrat is affordable and well engineered and has a couple of very useful features.

Two versions of the Paqrat are available: the RC24A interface is designed for ADAT machines, and the RC24T is equipped to suit DTRS-format machines (DA88s or PCM800s).

HARDWARE

The two versions of the Paqrat are identical apart from the machine-specific connectors on the rear panel. The case is a 1U rack-mount

machine, whereas the RC24T version has a 25-way D-sub TDIF connector, plus a BNC socket carrying the word-clock, to interface with a DTRS machine.

The interfaces are powered by an external transformer unit (with screw-down brackets) but the review model was fitted with a 2-pole European-style mains plug. The transformer provides a centre-tapped 9V AC supply through a six-way latching plug which looks very similar to the standard telephone plug. Fortunately, this is actually a little smaller than a normal phone plug, so it won't mate with a telephone socket — I tried! There are no fuses on the mains or low-voltage sides of the

transformer (other than in the plug-top if you fit a UK mains plug). Next to the PSU connector on the rear panel is a suitably marked screw which provides a chassis earthing point if needed.

Inside the Paqrat there is a great deal of empty space — so much, in fact, that the depth of the unit could have been 9cm less (or the mains transformer could have been built into the box). There are two high-quality circuit boards inside the unit, one immediately behind the front panel carrying the switches and indicators, and the other behind the rear panel carrying the socketry and all of the electronics.

All seven of Paqrat's integrated circuits are mounted in sockets, and should it become necessary to update the v1.0 operating software, access to the EPROM chip is very straightforward.

FRONT PANEL

The controls on the front of the Paqrat are very simple and entirely self-explanatory. On the extreme left, a yellow LED indicates an acceptable power supply, and next to it is a pair of green LEDs which show the presence of an input signal (labelled 'Sync') and suitably connected tape machine ('Transport Present').

Moving along to the right, a push button selects which group of tracks the input signal

will be recorded on (1-4 or 5-8) — the selection is shown on a pair of LEDs — and a second button (labelled 'Both') routes the input signal to all eight tracks simultaneously (making a redundant safety copy of the recording on the same tape). Further to the right of the panel, another push button with associated LEDs selects the replay group of tracks (again 1-4, or 5-8).

The right-hand half of the panel has a collection of LEDs to show the input signal sampling rate (44.1 or 48kHz) and word length (16, 18, 20, 22, or 24 bits). The extreme right of the panel contains the final push switch which truncates the high-resolution off-tape digital output to 16 bits but re-dithers the signal properly so that there are no nasty quantisation distortion products. This useful facility could be used to make 16-bit 'demo' tapes on convenient formats such as DAT or CD-R, while recording a 20+-bit master.

IN USE

The Paqrat performed very satisfactorily: it certainly coped with a 24-bit test signal perfectly well, and the 16-bit re-dithered output was fine.

I have only two criticisms: firstly, external mains transformers are my pet hate, and there is plenty of room inside the box to have a

proper built-in power supply. Secondly, it seems rather sad that there is no means of accessing the second group of four tracks while you're using the Paqrat to encode 24-bit signals on the first four. I see no reason why the Paqrat can't have two 24-bit inputs so that four high-resolution channels could be recorded simultaneously. Alternatively, standard 16-bit access to the remaining four channels would have allowed additional low-resolution tracks to be recorded along with the 24-bit stereo signal. Niggles aside, though, all in all the Paqrat is one of those very boring products that just does what it is supposed to without fuss or drama. SOS

Hugh Robjohns is a lecturer at the Centre for Broadcast Skills Training at BBC Wood Norton. The views expressed in this article are the author's own and are not necessarily those of his employer.

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Rogers db101

Nearfield Monitors

Is it a bird, is it a plane, is it a... toaster? PAUL WHITE tightens his seatbelt and road-tests the sporty new Rogers db101s.

Rogers are a rather conservative loudspeaker company, more normally associated with solidly-engineered, visually-anonymous broadcast and studio monitors, so it comes as rather a shock when they produce a monitor that looks not unlike the contents of a guillotine operator's basket shortly after a run-in with a Cyberman. You may have seen the news item that first mentioned these monitors in last November's *SOS*, accompanied by a picture showing the speakers in a rather fetching yellow and blue colour scheme. The db101s are in fact available in nine different finishes, ranging from fake wood, through '50s coffee bar kitsch, to shiny aluminium. Astonishingly enough, the blue and yellow option isn't one of them — that was put together purely for promotional purposes.

CONSTRUCTION

Designed as a general-purpose, nearfield monitor for private and commercial studio use, the db101s are nicely compact speakers (270 x 190 x 193mm, and weighing 2.3kg each) which won't get in the way if perched on a meter bridge. The cabinet is injection-moulded from ABS (the substance flightcases are made of), and the aluminium side cheeks are heat-bonded in place to maximise the rigidity, self-damping — and, of course, cuteness — of the enclosure. Behind the unorthodox presentation is a more down-to earth 2-way passive monitor design based around a fully shielded, 110mm, paper-coned woofer. featuring a rigid polymer chassis and a roll surround. The use of a polymer basket eliminates the possibility of the chassis metalwork affecting the performance of the magnetic system, and it also keeps the weight down. Driving the cone is an edge-wound voice coil on a Kapton former, and a bullet-shaped phase plug protrudes from the centre of the cone.

The crossover is a gentle first-order system crossing over at 5kHz, which keeps it away from the most vulnerable part of the speech band. The high end drives a ferrofluid-cooled tweeter with light polymer diaphragm, driven by a low-mass, formerless voice coil. Unusually, the tweeter (which is also magnetically shielded and fitted with a plastic phase plug) is suspended right in the centre of the bass port, giving the whole enclosure a 'Cyclops' character. Rogers claim that this topography produces good directional characteristics, and the off-axis response certainly seems excellent. The crossover itself has just five components, and fuse protection is provided against more vigorous overloads.

When it comes to driving these speakers, you don't need an awful lot of power, because, with a sensitivity of 92dB for 2.38V (1W nominal) at 1 metre, they are more efficient than most comparably sized monitors. What's more, they are rated at 4Ω, which means your amplifier will run at its most efficient. However, they can handle up to 125W peak, at which point they push out a butch 108dB, measured at two metres rather than the more usual one metre.

Connection is via spring terminals, which also accept standard banana plugs, though there is no provision for bi-wiring. The frequency response is flat within ±3dB from 75Hz to 21kHz, and because the design is ported, the bottom end rolls off fairly quickly below 75Hz. Even so, the monitors deliver a punchy sound, albeit without any true deep bass extension.

JUST LISTEN

Before settling down to a qualitative listening test, you really need to use the speakers for a day or so to run them in. This is actually true of most speakers, and rather than its being another piece of hi-fi mythology, there's actually a very good reason for doing it. The way a driver behaves in a cabinet is mathematically related to its mechanical stiffness, and a new speaker is always stiffer than one that has been in use for a while. After being used for a few hours, the surround tends to soften up, and I noticed a distinct change in tone after using the monitors for only a couple of hours. Straight out of the box, the speakers were slightly hard-sounding, with a noticeable mid-range peakiness, but this soon settled down to a smoother, more natural sound. In fact, other than the restricted bass end, these

> "They also look about as distinctive as it's possible for a speaker to look without wearing a party hat and a grass skirt."

little monitors perform surprisingly well for their size, presenting a reasonably neutral tonality, and with the ability to reveal detail. Drums and bass instruments kick nicely when you turn the level up a bit (within the limitations of a 75Hz low-end response), transient percussive sounds are handled with snappy precision, and stereo imaging is also good, with a reassuringly wide sweet spot.

Because the crossover is set up at 5kHz, vocals come over pretty smoothly, though there is evidence of a little smearing between the woofer and tweeter below the crossover

point, presumably because of the extent of the overlap a low-order crossover invariably involves. This certainly isn't serious but, in contrast with my ATC reference monitors, there was a slight, but still perceptible, sense of confusion in the upper mid range, along with some residual 'hardness' of tone. Given the size and intended application of these speakers, this artifact is very minor, and doesn't significantly impinge on these monitors' ability to effectively represent a mix.

I don't think the db101s are any more accurate than the much cheaper Rogers L1s I reviewed back in *SOS* January '96; indeed, the L1s may have a slightly better bass extension, but where the 101s score is that they are much tougher, they can handle more power, and they are capable of kind of SPLs professional mix engineers expect from their nearfield speakers. Apparently, they're already popular with dance music composers for this reason. They also look about as distinctive as it's possible for a speaker to look without wearing a party hat and a grass skirt.
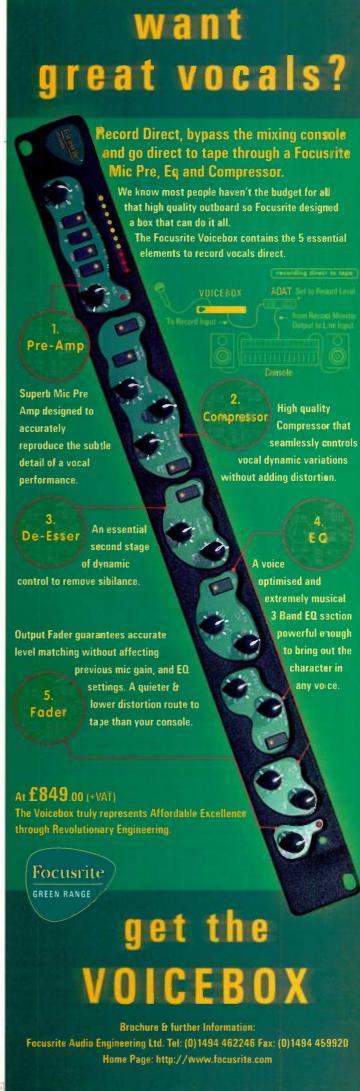
SUMMARY

These aren't the cheapest nearfield monitors around, and they don't have the best bass extension, but, within their price range, they offer the right combination of tonal near-neutrality, good transient handling, the ability to play LOUD, and the kind of sonic integrity we expect from Rogers. The magnetic screening is good news for anyone working close to TV or computer monitors, and the styling will attract attention (or at least people trying to find the slot for the toast!). If you need speakers of this physical size, then the db101s are as good as anything I've tried, and are rather more accurate than most. They aren't perfect, of course — all speakers are a compromise — but a combination of clever design and a devotion to accuracy rather than flattery on the behalf of the designers at Rogers makes these speakers entirely suitable for virtually any nearfield monitoring requirement. And they look great!

TL Audio Crimson

PA3001

Mic Preamp

RICHARD WAGHORN tests the TL Audio PA3001 alongside some of the best mic preamps available and discovers a good combination of price and performance.

TL Audio's new Crimson range of products makes their well-thought-out designs more affordable to us than ever before, by leaving out the valves and replacing the relevant circuitry with solid-state devices. The layout and operation are otherwise the same as for the acclaimed Indigo series, itself a low-cost alternative to the Classic series.

TL Audio's PA3001 4-channel preamp is essentially a stand-alone rackmount unit housing four mic preamps and a mains power supply. Continuously variable input and output controls and switchable high-pass filters (90Hz), plus phase reverse and 48V phantom power, are fitted to each channel. Input to each preamp is via a rear-mounted female XLR socket, electronically balanced and suitable for low-impedance (150-600Ω) microphones. Phantom power, for microphones that need it, is switched from the front panel independently for each preamp.

The input gain is variable from 10-60dB; the associated peak LED blinks when you approach clipping. The LED begins to illuminate at +6dBu, and is full on at +16dBu with 10dB of headroom remaining. A high-pass filter can be switched in to remove rumble and low-frequency noise, and a phase

reverse switch is fitted — this is useful in maintaining the correct relationship between microphones, particularly on close-miked drum kits or in other multi-mic situations. Finally, the variable output attenuator can be set to the optimum level for the next piece of equipment in the signal path (tape machine, mixer, processor and so on). The output appears on the back panel, at either an electronically balanced male XLR connector or an unbalanced jack socket (+18dBu maximum).

IN USE

I found the PA3001 easy to install (there's no external power supply) and the levels were quick to set up. The single LED indicator, although minimalist, functions intuitively. The high-pass filter is set to -3dB at 90Hz (12dB/oct), a sensible place to have a fixed roll-off, although I miss the luxury of a variable filter. A phase reverse switch is one of those things that you never need to use until you haven't got one, so it's good to have one available. The output level range allows this preamp to be used in a broad variety of applications: live, it can be used to provide four low-Z mic inputs to a mixer with indifferent mic amps; in the studio, its most obvious application is as a one-stop, direct-to-tape microphone stage to get the cleanest possible signal to tape. Many small studio owners, myself included, are using high-quality outboard to feed the recorder and a compact budget mixer to monitor back off tape.

One useful addition would be to have instrument input jack sockets on the front panel for DI'ing guitars and unbalanced high-impedance microphones.

THE SOUND

Now for the subjective part. I am convinced that it's in the choice of microphone and preamplifier (performance permitting) that a good recording is created. A great recording, for me, must focus not only on the sound, but also the performance. The detail and subtleties must be heard, but the silence within which the sound is being produced should be sensed too. Ultimately I should be able to close my eyes and visualise the musician playing in front of me. The best preamps I have used to achieve this to date are the Neumann V76 valve amps designed in the late '50s. So with the TL Audio preamp under my arm, plus a couple of mics, I

visited fellow sound engineer Mick Dolan, who possesses an arsenal of the aforementioned valve amps. I listened to the PA3001 alongside the V76, and also compared it with a Mackie mic input stage, while Mick sang and strummed an acoustic guitar.

As expected, the V76 sounded rich and beautifully smooth at the top end. The TL Audio channel fared well, although it sounded a tad thinner and harsher at the higher frequencies. Overall, the sound was somehow less well defined, though in all honesty the TL Audio preamp is probably less coloured than the V76, which includes both valves and transformers. The Mackie preamp, which I've always thought of as being good for a budget-to-mid-price console, sounded in its turn discernably less well defined than the PA3001.

CONCLUSION

At just under £470, this unit offers four preamp channels at a similar quality to what you'd expect to find in a good (but not esoteric) pro desk. It offers a significant improvement over most of the budget consoles that I've heard, and, as TL Audio units usually are, it is solidly built and well constructed. Those who want to improve on the performance available from a budget console without the expense of a more sophisticated esoteric design should find this a strong contender.

Yamaha MFC10

MIDI Foot Controller

Yamaha's MFC10 MIDI foot controller aims to put control right under its user's feet. PAUL WARD boots it up...

I'm on stage. The strains of the first song are still fading under the roars of adulation of thousands (I can dream, can't I?). Somewhere in the darkness on stage, I'm desperately trying to find the small piece of liquorice hidden on the black panel of my master keyboard that masquerades as a patch-change button. Sounds familiar? Then read on, for Yamaha is sending help in the form of the MFC10 MIDI Foot Controller.

The MFC10 is not simply a set of patch change footswitches. Nosiree. This machine will also give you up to five pedals with which to bend MIDI devices to your will, not to mention making control of multiple instruments a single prod of the foot away. Let's get down to it...

WARTS 'N' ALL

The MFC10's overall build quality is solid and chunky. On the underside of the casing are some nice stage-gripping rubber feet. Unfortunately, the MFC10 is powered by an external 'wall-wart' power supply. In live use these are about as welcome as a flatulent event in a spacesuit, although Yamaha have at least seen fit to include a cable strain relief to prevent the power connector being tugged out too easily (leaving the cable to be ripped out from the warty end, perhaps?).

Four extra foot controllers may be plugged into the rear of the unit. The MFC10 will happily accept continuous control pedals, or footswitches of the triggering or latching type.

MIDI In and Out are present; MIDI Thru isn't, as it's not really necessary here. A connection for the Yamaha WX7 and 11 Wind Controllers is provided, and the MFC10 will supply them with power, obviating the need for a BT7 power box.

AN ILLUMINATING EXPERIENCE

The front panel features large, illuminated characters above each chunky footswitch and a clear 3-digit numeric LED. Just above each footswitch there's also a bright red LED denoting which switches are active. With all this illumination, the MFC10 isn't going to disappear when the lights dim! Ten of the footswitches are designated 0 to 9, while another acts as a '*10' switch for higher program numbers. The remaining 'Function' footswitch toggles the rest of the switches between Program Change memories and Function memories — more on these later. Five small buttons toward the back of the unit handle all the MFC10's editing and housekeeping functions.

Setting up the Program Change memories is relatively straightforward: simply select a memory number with the footswitches and press the Memory Edit button. Repeated pressing of this button cycles through the edit parameters; you can stop on any parameter and make use of the Inc/Yes Dec/No buttons to edit the value. Four types of MIDI data may be transmitted from a program change memory. The MIDI channel is set in hexadecimal, although I really can't see a good reason for this. The program and bank numbers are mercifully restricted to good old 'normal' numbering of 1-128 and 0-127 respectively. Yamaha have thoughtfully provided full control of both the MSB (Most Significant Byte) and LSB (Least Significant Byte) of Bank Change numbers. I was a little disappointed to discover that there's no option

to send a MIDI Volume command — or any other controller data — with a Program Change memory. A press of the Write and Yes keys commits changes to the memory slot.

A PRIVATE FUNCTION

Nine basic message types may be transmitted from a Function memory, including Note on/off (with velocity) and MIDI Controller changes. Control change messages are specified with a value to be transmitted when the footswitch is pressed, and a value to be transmitted when the footswitch is released. Where the MFC10 really scores is that four sets of these Function parameters are available for storage in Function memories 0 to 49. So, for example, it's possible to change programs on up to four connected devices, or play four-note chords with each footswitch. Multiple footswitches can be pressed for layering.

Further options in the Function memories allow footswitches to be utilised as controllers for a sequencer or compatible rhythm programmer. Tempo Control, Song Select, Start, Stop and Continue are all available, but Yamaha have gone a step further to enable switches to select Song sections on devices such as their own QY700.

In addition to the MFC10's ability to flip between Program Change memories and Function memories from the front panel, its Mix switch on the rear allows a hybrid approach. Mix mode assigns

the upper five numbered footswitches to Function memories, while the lower six remain to access up to 25 Program Change memories. Interestingly, these Program Change memories in Mix mode are actually separate from the 128 defined in Normal mode, which adds a little extra flexibility to the MFC10. Toggling the Function footswitch on in Mix mode turns the whole device over to Function memories, much the same as in Normal mode.

But what of the intriguing foot pedal over there on the right? Well, this controller can be set to transmit control changes, aftertouch, or pitch-bend data. The minimum and maximum values for the pedal are adjustable. Better still, any of the other five connected pedals has identical parameters, making this a control station par excellence! Unfortunately, I ran out of pedals before the MFC10 ran out of inputs for them, but the potential is clear.

The MFC10 is happy to send its memory contents as a system-exclusive dump to an external storage device. There are four basic dump types, transmitting the Normal mode memories, the Mix mode memories, the Function memories and the Foot Control memories — or a full dump of all of these.

CONCLUSION

It's hard to imagine a MIDI-based musical environment that wouldn't benefit in some

way from the MFC10's presence. For keyboard players, the unit scores by merging data arriving at the MIDI input with that generated by the MFC10 itself, so it can plug directly into your keyboard's MIDI input, or be tapped into the MIDI chain after the keyboard's MIDI output. This is undoubtedly of great use in both live and studio situations. Owners of Yamaha's WX Wind Controllers will be major beneficiaries of the MFC10, since they can plug straight in and control their entire MIDI system remotely. MIDI-aware guitarists could couple the MFC10 with an effects device capable of external MIDI control — with five pedals available, the range of control should satisfy the most ardent of twiddlers. Users of guitar synths will discover a simple way to implement program changes to sound modules, in addition to transmitting control information or playing pedal notes by foot during performance. One-man bands with a foot to spare will find the MFC10 useful for stopping and starting sequencers, and owners of Yamaha's QY700 will be able to re-arrange their song structures in real time by transmitting Section Select messages.

This is the kind of device that you either know you need or consider you have no earthly use for. It applies some creative thinking to a specific task and comes up with the goods. I have one or two gripes: some of the strange

abbreviations for many of the parameters means that the manual must be close to hand for a while, and some of the editing could also have been made easier with the implementation of a MIDI 'learn' mode. But the only serious reservation I have left is the external power supply, which will scare off a lot of live users — myself included. Other than that I'm happy to give the MFC10 the thumbs — sorry... toes up. **SOS**

BBE 262

Sonic Maximiser

If you're suffering from muddy sounds, BBE's smallest Sonic Maximiser yet could be just the thing to clean them up.
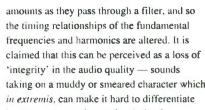*HUGH ROBJOHNS puts on his gumboots and wades in.*

The model 262 Sonic Maximiser is the latest and smallest in BBE Sound Inc's range, and brings the benefits of the Sonic Maximising process in a form that is both easy to use and extremely effective.

THE PROCESS

BBE's Sonic Maximising process has been designed to compensate for the common

amounts as they pass through a filter, and so the timing relationships of the fundamental frequencies and harmonics are altered. It is claimed that this can be perceived as a loss of 'integrity' in the audio quality — sounds taking on a muddy or smeared character which, *in extremis*, can make it hard to differentiate between, say, an oboe and a clarinet!

The BBE 262's signal processing splits the audio signal into three bands: 20Hz-150Hz, 150Hz-1200Hz, and 1200Hz-20kHz. The lowest band is delayed by about 2.5ms through the action of a passive low-pass filter. The middle band is delayed by about 0.5ms through an active band-pass filter (thereby causing high fundamentals or low harmonics to exit the unit before the lowest fundamentals). The highest band is not delayed at all: it's processed by a voltage-controlled amplifier whose gain is determined by the average loudness of both the middle and high bands, so that the high-frequency harmonic content can be

pros & cons

BBE 262 £159

pros
- Adds clarity and detail to most signals, either individually or within an overall mix.
- Easy to set up and use, with a high-quality signal path.

cons
- Difficult to judge the effectiveness of the 262 process objectively, as the bypass facility is not level-matched to the processed sound.
- Poor source material can suffer from exposed noise and background noise-pumping effects.

summary
A cost-effective signal processor which can lift a poor recording by enhancing the upper harmonics to increase the perceived clarity. The process also delays low-frequency fundamentals relative to their higher-frequency harmonics, compensating for typical loudspeaker deficiencies.

SOUND ON SOUND

five quarter-inch jack sockets, four of which are used for unbalanced inputs and outputs (up to +6dBu input and +17dBu output); the last is a footswitch socket to engage the signal processing remotely. Also on the rear panel is a square red button to turn the unit on, and a co-axial 12V AC power socket — a suitable plug-top mains adapter is supplied with the unit.

The front panel has four rotary controls and another square red button, which provides a bypass facility (replicated by the footswitch socket); the associated LED glows green when the BBE process is functional, red when bypassed.

The two audio channels each have a pair of rotary controls labelled 'Lo-Contour' and 'Process' and these increase the relative amplitude of the lower and higher bands of the processed signals by up to 10dB at 50Hz and 5kHz respectively. In addition, the Process control activates the 'BBE Process', allowing the system to actively re-balance the mid-range and upper harmonic levels and introduce the fixed timing correction between fundamentals and harmonics.

Although there are no input level controls, or even a level meter, the 262 seems perfectly able to cope with a wide range of signal levels without overload or noise problems (in fact the signal-to-noise ratio is quoted as an impressive 112dB with processing active), and I experienced no interfacing problems at all when using the unit in nominally -10dBv systems.

The manual supplied with the 262 is well written and remarkably informative. Not only does it provide a useful description of the aims and nature of the signal processing, it also

inadequacies of conventional loudspeakers and their passive crossover networks. Over the last 10 years, BBE engineers have studied a wide variety of loudspeaker systems and believe that they have identified the characteristics of both an 'ideal loudspeaker' and the corrective action required to make typical loudspeakers behave properly.

The problem that the BBE process is trying to overcome is the inherent envelope distortion that's caused by any filtering process but particularly by those processes associated with loudspeakers. Signals of different frequencies are delayed by different

'optimised'. In the case of the 262, all this signal processing is performed within a single dual-channel integrated circuit.

THE HARDWARE

The 262 feels very solid and is surprisingly heavy given its diminutive size: the steel case is finished in a very attractive textured grey paint which adds to the overall impression of a high-quality unit. The 262 can process two independent audio channels; although the handbook talks about using the unit to process stereo signals, there are no linking facilities for accurate stereo working. The rear panel has

includes the complete circuit diagrams of the unit and full engineering alignment procedures. There are seven pages giving examples of typical operational uses and system connections and some very helpful advice about how the unit interacts with normal equalisation practices.

THE RESULT

There can be no doubt that the 262 Sonic Maximiser modifies the signals that pass through it in a comprehensive way! The problem I had was in trying to judge exactly how effective the process was, because, as the two operational controls of each channel are increased, the output level rises — and quite considerably when the controls are fully clockwise.

One thing I'm always at pains to point out to people learning how to use EQ for the first time is that it's very easy to fool yourself into thinking that your equalisation attempts have made a sound source 'better', when in reality all you've done is make it louder and brighter. This is very much the case in point with the Sonic Maximiser, since it's been specifically designed to make the sound louder and brighter. The real problem is that the Bypass switch doesn't maintain the overall programme level and therefore switching the processing out always results in a dull and lacklustre sound, with the inevitable result that you become convinced that the 262 has magical properties which must be used at all times! Splitting the input signal at source and comparing the direct and processed versions on a mixing desk, where average levels can be matched more accurately, will let you appreciate the true benefits of the BBE 262.

Essentially, the spectral balance of harmonically rich programme is altered in such as way as to make it sound brighter, richer and 'more interesting', in a similar way to the effect produced by an enhancer, but possibly more 'naturally'. There is a down side to the BBE signal processing, however, and that's its tendency to increase and expose tape hiss or other electronic noise, and to compound this problem with audible pumping or breathing effects on some critical audio material.

I wasn't able to perceive a definite benefit of the re-timed fundamental and harmonics, but the overall impression of the signal processing was certainly to make average and poorly-recorded complex sound sources seem less muddy and indistinct. Care should be taken if a 262 processed signal is mixed with a non-processed version of itself (if there are high levels of spill from another microphone, for example), as the built-in processing delay can cause a mild phasing effect. Also, processing stereo signals is tricky because the difficulty of matching control settings between channels, combined with the automatic and dynamic level adjustments to the high-frequency band, causes an unstable and constantly shifting stereo image.

THE CONCLUSION

All in all, the BBE 262 Sonic Maximiser is well built and effective, and gives most sound sources — or, better still, complete mixes — extra clarity and weight. Although this is the baby of the range in terms of size and price, it manages to pull its weight on sonic quality and, providing it's used with care, it could be a cheap and cheerful alternative to equalising and compressing a demo master. [SOS]

Hugh Robjohns is a lecturer at the Centre for Broadcast Skills Training at BBC Wood Norton. The views expressed in this article are the author's own and are not necessarily those of his employer.
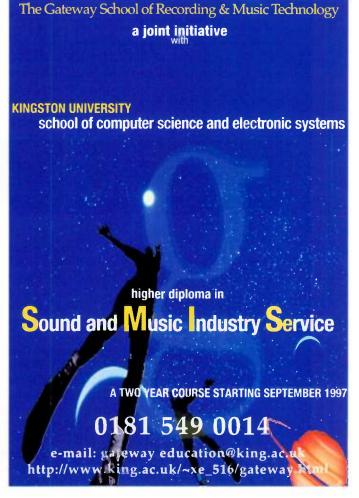
Rane Mojo MH4

Headphone Amplifier

If you don't need separate mixes for each musician, the Mojo MH4 may be everything you need in a headphone amp, says PAUL WHITE.

For years you never see a headphone amp, then a whole bunch come along at once. This month's offering is part of Rane's Mojo series and is a full rack-mounting, 1U device, powered by a mains adapter (which is included). Just as the Samson Q5 — which we reviewed in March 1997's issue — did, the Mojo MH4 keeps things simple in order to maintain an attractive retail price. In this case, you get four independently controlled stereo phone outputs fed from a single stereo source. The inputs are on two balanced TRS jacks, though unbalanced feeds may also be used if you simply plug in mono jacks. A yellow power LED accompanies the front-panel power-on button.

A globally acting mono switch is fitted to the front panel, allowing both phones to be fed from a mono mix of the two inputs, and each output (quarter-inch stereo TRS jack) has its own overload LED — very useful when you're trying to figure out whether the distortion you're hearing is due to overloading the MH4, the phones, or your ears! There are no linking jacks on this unit so, to feed two units, you'll need to use split leads, and the available amplifier power is a maximum of 200 milliwatts per output, enabling headphones of 32Ω and upwards to be used. The optimum range is 32-150Ω, as higher-impedance phones will tend to produce less level, though phones up to 600Ω may be used. Because lower-impedance phones produce a much higher sound level than high-impedance phones when driven from the same voltage, output settings may vary radically depending on the type of phones used. The frequency response extends from 20Hz-20kHz; the clip LEDs come on 3dB before clipping, and the maximum gain is +26dB.

IN USE

The sound quality from the Mojo MH4 is fine both with open and enclosed headphones, though with two different pairs of phones some distortion was audible just before the clip LED

is no master input trim control on this unit, but I can't say I missed it. So long as you keep your eyes on the clip LEDs, setting up is as simple as plugging in and turning up the level.

SUMMARY

The Mojo MH4 is an affordable 4-way headphone amplifier for use in situations where it's okay for each performer to receive the same mix. I like the rackmount format, the build quality leaves no cause for concern, and the Mono button is useful. For those who prefer to wear one phone on and one phone off, the stereo inputs enable you to feed a

> **"So long as you keep your eyes on the clip LEDs, setting up is as simple as plugging in and turning up the level."**

came on, suggesting that the phones were calling it a day at about the same time as the output amps were. However, I'm convinced that I get more clean level out of my home-made headphone amps based on 2W-per-channel integrated amplifier chips, so maybe some distortion is audible before hard clipping takes place. For most recording purposes the level is adequate, but I felt that the maximum level was a little short of what some drummers might demand — regardless of how bad it is for their ears! (The same is true of the Samson Q5, reviewed last month, though.) However, the manual does list the maximum SPL that can be expected from several different types of popular headphone, and this ranges from 107dB-126dB, which is seriously loud. There

single send into just one input so that the other remains silent. Alternatively, if you need a mono feed in both ears from a single input, the Mono button does the trick. I'm still not convinced that the output is clean enough at very high volumes when you're using low-sensitivity, high-impedance phones, but other than that, the Mojo MH4 works fine. **SOS**

TDK DA-R STUDIO

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Kurzweil K2000/2500

Sounds OK • Voice Crystal Sound Sets

PAUL WARD looks at two third-party sound collections designed to give your K2000 or 2500 a different voice...

Despite the fact that many modern synths are more programmable than ever before, there's still a healthy market for third-party sounds for those who haven't the time or the inclination to do their own programming. Even if you do program your own sounds, ready-made sets can still add a different element to your music, or provide an inspiring starting point for your own experimentation. Here I'm looking at two sets for the Kurzweil K2000 and 2500, one from Voice Crystal and one from Sounds OK.

VOICE CRYSTAL K2000 VC1/2/3/4/5

The 100 programs on each of these disks are very much aimed at providing a pick 'n' mix toolbox for keyboard players who want to spend less time programming and more time playing. With one or two minor exceptions, I think that Voice Crystal, surely one of the best-known and longest established third-party sound producers, have succeeded in this aim.

Disk 1 consists of a solid collection of workhorse sounds, including various acoustic and electric pianos, organs, guitars, basses, brass, synth and vocal patches. I found the high spots to be among the guitars, all of which are eminently usable and inspiring to play. The

weakest sounds are the synth leads, which suffer from odd portamento timings and the infamous clicks caused by portamento glides crossing multisamples. There's little to get really excited about here, but for a consistent supply of bread-and-butter sounds you won't go far wrong.

Disk 2 follows up with a varied collection of synth sounds, touching on samples of the JD800, some reasonably convincing PPG emulations, and several mediocre dance basses. This is the least successful of the Voice Crystal disks. I can't imagine what style of music would encompass such a strange palette of patches, but most of it is rather uninspiring in any case.

Disk 3 is another odd collection, dipping into a whole variety of material that crosses the boundary between techno and trance, whilst featuring some patches that wouldn't be out of place in a New Age composer's grab-bag. Some of the sounds here are shaky, and many are just downright odd, but if you want something a little out of the ordinary, this disk could come up trumps. The documentation supplied was rather inaccurate in some respects and, despite what the notes say, no sample memory is necessary.
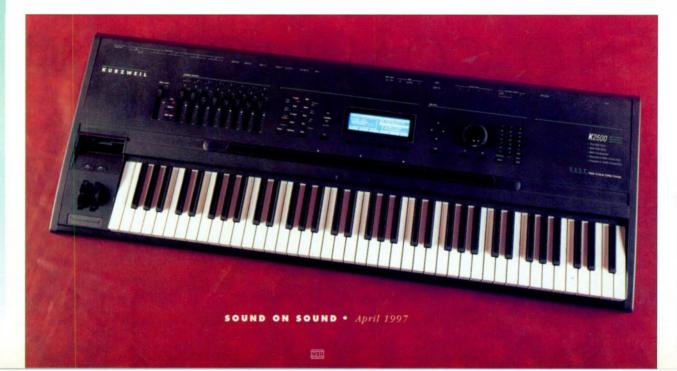
We're back on the dance bandwagon with Disk 4, which offers a delightfully programmed range of pseudo-analogue sounds to bend minds and rattle subwoofers. The TB303 emulations are not the best I've heard from the K2000, but are perfectly adequate for most situations. The sub-basses and Moog patches steal the scene, lending plenty of power and character to a typical mix. Like disk 3, disk 4 does not require any sample RAM.

The last sound set, VC5, actually consists of two disks, although the number of programs remains at 100 (the second disk being required to

hold almost 2Mb of sample data). If there are any funk, jazz or rock keyboard players still out there, this collection could well be for you. There's a little of everything here that you've heard from the worst of 'elevator' jazz-funk to the best of American West Coast jazz-rock. A particular highlight for me was the superb 'Anapadstring', with which you'd be capable of convincing anyone that you'd just bought a Jupiter 8! Generally this is the most competently programmed of the Voice Crystal disks, although I'd steer well clear if you've never heard of Toto.

There's enough quality and variety in this collection to satisfy just about anybody, despite the odd group of duffers. Modulation sources are used inventively, and the effects are thoughtfully programmed to complement the patches to which they are assigned. If your K2000 is sounding a little stale, these disks might just perk it — and you — up again.

Sounds

SOUNDS OK K2000/2500 VOLUME 3 ANALOGUE DANCE

This disk presents 100 programs aimed at musicians and producers of dance music looking for analogue-type sounds. You need 2Mb of sample RAM to load the volume, which features samples of the legendary Oberheim Matrix 12: documentation is sparse, but it does include a list of all the programs you can expect to find after loading. Notes tell you where a sound can be altered by way of the mod wheel, data slider, or aftertouch, but I found several of these to be inaccurate — if you buy this collection I'd suggest you twiddle everything just to make sure.

Some of the sounds on this disk have been ported over directly from Sounds OK's Volume 1 Matrix 12 collection. Unfortunately the samples are just as bad here as they were on the original, with the same nasty loop clicks and low-frequency noise that I noted in my review of that collection (see *SOS* March 1996). This is a shame, because with a little work and some high-pass filtration the samples become much more usable — but I don't expect to have to do this when I'm buying ready-built sounds.

As a group of inherently analogue sounds, this collection isn't bad, but it is certainly patchy. 'Session Brass', for instance, is a rather bland stab at a realistic brass sound, which wouldn't realistically be mistaken for an analogue synth. On the other hand, some of the sounds should move feet on the dancefloor: 'modwhlBASS', 'Ana Dnc Bass', and 'aka multi' all have that indefinable something that instantly makes you want to try them over a TR909 drum groove, but

these are in the minority. Many of the programs are left/right keyboard splits, which pleases some people and annoys the hell out of others. Certain sounds crop up several times in the split programs, leading me to wonder how many of them are added in merely to fill up the 100-program allocation.

Overall, I really have to give this volume a thumbs-down. There are quite a few good sounds in there, but nothing that's much better than many that are freely available from the Internet. If you don't have access to another source of analogue-type sounds for your K2000/2500, this collection might be a good starting point. But my advice would be to learn sufficient programming skills to be able to customise these sounds to your exact requirements.

pros & cons

SOUNDS OK ANALOGUE DANCE

pros
• Some nice and appropriate dance-style sounds.
• Many patches reward a bit of tweaking...

cons
• ... but you don't really expect to have to do that with ready-made sounds.
• Program quality is patchy.

summary
There are a few gems in this collection, but overall it's not the best choice if you want ready-to-go sounds that don't need any extra work.

SOUND ON SOUND

£ Voice Crystal VC1-4 £39 each; VC5 £49; Sounds OK Analogue Dance £29. Prices include VAT, but please add £2 per order p&p. Special offers on multiple disks are available. Please call for details.
A Sounds OK, 10 Frimley Grove Gardens, Frimley, Camberley, Surrey GU16 5JX.
T 01276 682313.
F 01276 682717.

Beyer Blueprint A75

Stereo Amplifier

An amp is an amp is an amp... but PAUL WHITE finds himself vexed by such eternal verities.

Life is an odd assortment of very interesting things, slightly less interesting things, dull things, extremely dull things — and power amplifiers. If Arthur Pewty (Michael Palin's seriously dull Python accountant) were to score a nominal two out of ten on a scale of universal dullness, power amps would come out at about minus three, just above the A to Z of John Major's wardrobe and marginally below the Spice Girls' ten top tips for revitalising British politics. What's worse, power amps aren't even funny, although — unlike the Spice Girls or John Major's wardrobe — they are necessary

items without which no recording studio could function. Beyer have obviously realised that there is a perception problem with power amplifiers because they've painted theirs blue, but I'm not convinced this is sufficient to elevate a power amplifier to the coveted status of 'mostly boring'.

BORED TO BE WILD

Based on well-proven bi-polar circuitry, the Blueprint uses a complementary output stage based on the TIP3055 and its twin the TIP2955. The design provides 75W of clean power, per channel, into any well-behaved 4Ω load; though, as most studio monitors seem to weigh in at 8Ω, the maximum power in this case will be 50W per side. The manual recommends 8Ω speakers for continuous high-power use, and suggests that if several Blueprints are to be racked, there should be at least 1U of space left between them to allow cooling.

Studio power amps are required to be mechanically quiet and to take up as little space as possible, something the Blueprint achieves by packing itself into a 1U rack case with a generous heatsink protruding from the rear panel, enabling the amplifier to run without recourse to fan cooling. The inputs are electronically balanced on conventionally wired XLRs, though they may be used unbalanced if you join pins 1 and 3 together. Power goes in via an IEC socket, and the outputs are on Speakons only.

While Speakons are a good idea for high-power amplifiers, I feel that their exclusive use in this case is pandering a little too much to the Euro over-regulators who seem intent on choking our industry. I know that the Euro regs are based on guaranteeing immortality to a 90-year-old granny with a weak heart, soaked in sea water and earthed by the left leg to a copper water main, who's set on exploring every orifice of a piece of live studio equipment using a three-inch stainless-steel hat-pin — but I'm more likely to die from stress at not being able to find a Speakon cable when I need one.

The front-panel controls are frugal, to the extent that Beyer have put a knob on the rotary on/off switch, just to give you false hope that there might be something to twiddle with other than the channel 1 and 2 volume controls. However, any proclivity for twiddling will have to be satiated elsewhere. And apart from the matching blue power LED, there's not much to look at, either — not even clip LEDs.

IN USE

Having gone to great lengths to underline the boring nature of power amplifiers, I have to admit that there is one area in which it is imperative that they remain boring — reliability. There's nothing worse than having an 'interesting' (in the Chinese sense of the word) power amplifier. All you really, really want is to plug the thing in, forget it, and have it last forever. Though I didn't have forever in which to put this to the test, the Blueprint runs reasonably cool, and shows no sign of misbehaving when used for extended periods into typical 8Ω studio monitors. Though I didn't have any 4Ω studio monitors around for test purposes, I wouldn't anticipate any thermal

problems unless the amplifier were either very badly located, or subjected to maximum-level, zero-dynamics audio at all times.
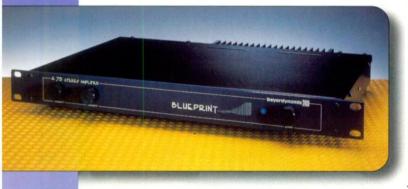
On paper, the A75's specification is respectable without being anything out of the ordinary, but in practice the sound is powerful, smooth and apparently uncoloured. The bass end is particularly tight and solid — something bi-polar amps seem to do well. There's also virtually no audible background noise from the speakers.

SUMMARY

Though technically unremarkable, this is a very competent, sensibly priced power amplifier that runs quietly and doesn't hog too much rack space. Having just 50W per channel into 8Ω isn't over-generous on the power front, but it is sufficient for many nearfield monitors, especially in a domestic situation where volume levels have to be kept under control. However, I do feel that leaving out clip LEDs on an amplifier with such a modest power rating is a bad move — it's very easy to drive a 50W amplifier into clipping on peaks if you're monitoring uncompressed material. I'm also less than convinced by the need to have Speakon outputs when spring terminals would have been easier to connect. All in all, though, in building the A75 Beyer have provided the right balance of cost and performance in a neat, quiet package — and when all's said and done, blue is *slightly* more interesting than black. **SOS**

WORLDWIDE MAIL ORDER

RETAIL CHAIN IN THE UK TODAY

LOG Advance
Non-coding Audio Recorder

In this exclusive preview, PAUL WHITE is introduced to a brand-new way of making high-resolution digital recordings.

Over the past few years, digital recording has become the standard, both in professional and private studios, but already the limitations of the conventional digital format are beginning to show. As we demand more resolution, the technical problems associated with designing and building converters that can discriminate voltage steps of less than one microvolt threaten to call a halt on what can be achieved, and as calls for higher sample rates are heeded, these problems will get worse. There's also the problem of data corruption. No matter how powerful the error-correcting system, there comes a point where the data loss is too great to reconstruct, and the result is a glitch. Anyone with more than a little experience of DAT recorders will be familiar with the situation where a tape made on one machine glitches badly on another — a problem caused by the need to read data from precise areas of the tape's surface at precise times.

Having had several years to study the pros and cons of various systems, an ARS working group, in co-operation with data-recording specialists LOG, have come up with a different approach that is surprisingly robust, and also avoids weaknesses such as quantising noise and sample-rate jitter. Because tape is still the lowest-cost medium, preliminary trials using a stereo machine have been carried out to test the validity of the process, and so far the results are encouraging. Indeed, we could see commercial recorders based on this technology being introduced into the marketplace within the next two years; given the professionals' dissatisfaction with DAT, I anticipate a lot of interest.
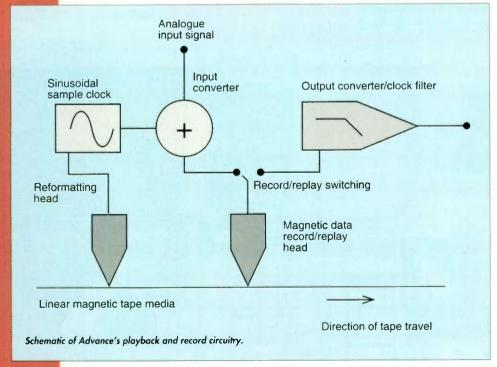
SAMPLE RATE

Much has been said recently of the need for higher sample rates but, as mentioned earlier, the faster a converter runs, the more difficult it is to retain accuracy, and even the very best 24-bit converters running at 44.1kHz don't manage much in excess of true 21-bit dynamic range. This new system does away with conventional converters altogether — instead, the sample clock, which is sinusoidal rather than a square wave, is simply mixed with the analogue input signal; the result is then applied to a fixed magnetic recording head where a magnetic flux proportional to the composite signal is transferred to a section of moving tape. The sample clock can be anything from 60kHz to 100kHz, and the analogue input must be band-limited, as in all digital systems, so that the maximum input frequency never exceeds the Nyquist limit of half the sample rate. The beauty of this system is that, instead of being limited to a fixed number of discrete quantised steps, its quantisation is carried out at molecular level by the amount of energy required to flip each magnetic molecule from one state of its hysteresis curve to the other. In effect, each magnetic molecule stores one bit of data.

Using this basically simple approach, recordings can be made onto very narrow bands of tape, and the current systems use a split head so as to record stereo signals as two discrete tracks. Of course, problems do arise because of the statistical nature of tape — if everything was perfect, you'd be able to record onto a track comprising a single line of oxide molecules, but, in reality, flaws in the tape coating and misalignment of the oxide molecules mean that such a recording would be flawed by errors. However, the errors would show up as statistical noise rather than as glitches, which gave the designers an idea of how to tackle the problem.

ERROR CORRECTION

Conventional error correction works by recording a certain amount of redundant data, then using powerful algorithms to detect and then correct faulty blocks of information. In contrast, this new system simply uses a slot-shaped gap in the record head so as to record the same data over a wider strip of tape. When replayed, the data is, in effect, read back several times from a huge number of parallel, one-molecule-wide tracks and then averaged. This way the error correction relies on natural statistics rather than mathematical codes. Because correlated signals sum linearly (uncorrelated noise both adds and cancels), using this form of error correction results in a robust signal with a high degree of integrity and a high resistance to data failure. If a surface oxide flaw is encountered, the statistical summation process will be compromised, but when

Schematic of Advance's playback and record circuitry.

Analogue input signal

Sinusoidal sample clock

Input converter

Output converter/clock filter

Reformatting head

Record/replay switching

Magnetic data record/replay head

Linear magnetic tape media

Direction of tape travel

the signal is decoded, the outcome is simply a momentary increase in noise or a drop in level rather than a complete data loss.

Perhaps a greater benefit of the system is that, because conventional converters are not employed, there is no quantisation noise other than that created by the statistical nature of the magnetic domains on the tape's surface. This statistical noise sums to produce near-Gaussian broad-band hiss — in effect a perfectly implemented dither system at quantum level. Furthermore, because the sample clock is sinusoidal, and because the oxide molecules are randomly spaced on tape, the playback sampling rate is essentially random and determined by the rate at which individual oxide molecules pass over the replay head.

DECODING

The recorded signal is picked off tape using a stationary magnetic head in the conventional way. No buffering is used either at the record or playback stage, and conversion back to analogue requires only that the the sample clock be excluded from the output signal by means of filters. This produces a smooth analogue output which can be resampled with no fear of clock clash. The lack of buffering does make the system subject to pitch modulations introduced by motor-speed errors, but the latest generation of quartz-locked direct-drive motors reduces this to an insignificant level. Formatting the tape simply requires the oxide molecules' magnetic state to be randomised by the application of the raw sample clock to a separate head positioned a short way before the record/replay head. In this way, the tape can be
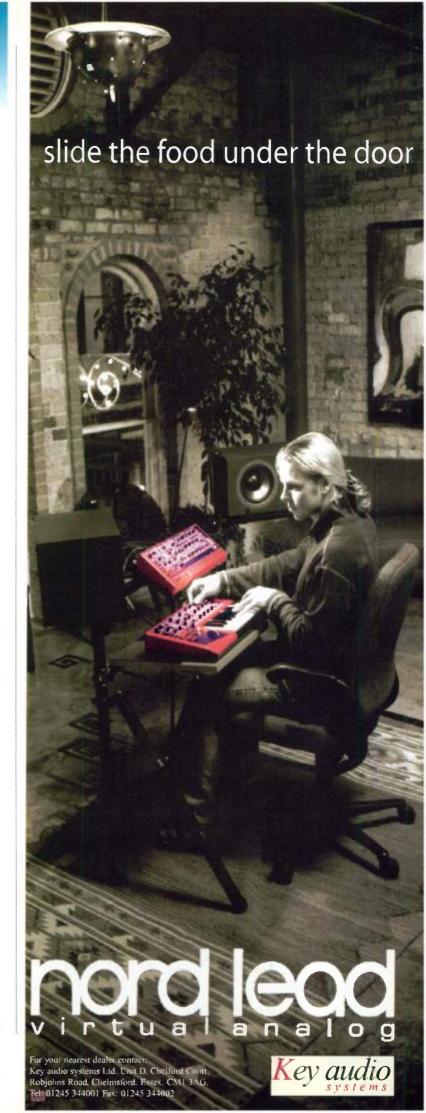
> "...quantisation is carried out at molecular level by the amount of energy required to flip each magnetic molecule from one state of its hysteresis curve to the other."

formatted as it is recorded — there's no need to waste time striping the tape prior to a session.

Because there's no hard clocking or dividing of data into packets, tape speed may be varied for traditional varispeed effects without affecting the data integrity, and it's even possible to turn the tape over for reverse effect — something conventional digital machines can only dream of. The best news yet is that, because of the simple mechanics of the system, it may be possible to adapt old open-reel machines at a relatively low cost. What's more, using conventional quarter-inch tape retains the subtle harmonic distortion characteristics of this medium, which means that getting a vintage sound is as easy as threading up a reel of tape.

Future plans include a multitrack version of the machine based around a wider tape format, possibly 50.8mm, and a multi-faceted record head capable of recording a number of discrete tracks side by side. It's also possible that the dynamic range of such a recorder may be further extended by applying frequency- and level-sensitive compression to the input signal and then applying a reverse function to the playback audio directly after conversion.

The first production machine will be a stereo mastering recorder built under the LOG badge, and entitled the Advanced Non-coding Audio LOG recorder — ANALOG for short. From what we've heard so far, it has a great future.   SOS

Yamaha AN1x

Analogue Physical Modelling Control Synth

This year's Frankfurt Musikmesse was virtually stuffed with digital synths in analogue clothing. MARTIN RUSS takes an exclusive first look at Yamaha's eagerly-awaited entry in the 'analogue for the '90s' stakes, the AN1x.

U nless you've been visiting a different universe recently, you may have noticed that, after a quiet period, things have hotted up in the synthesizer world. The Clavia Nord Lead woke people up to the idea that digital technology could sound remarkably analogue if it was cleverly programmed. Korg's Prophecy showed what a melding of digital physical modelling and a monophonic synthesizer could do for a performance instrument. More recently, Roland appear to have crafted an instant 'classic' with their digitally implemented, analogue modelling JP8000 polyphonic synth. But nothing stays fixed for long in the world these days, and Yamaha's newest release provides a bigger keyboard, more polyphony, more digital effects — and a price tag which does not reflect it.

The AN1x is a polyphonic analogue synthesizer, but one that uses today's digital processing rather than 1970s operational amplifiers to produce its sounds. It also features a reworking of the user interface of the CS1x S+S Control Synthesizer (which we reviewed in *SOS* in August 1996), but with a few quirks fixed.

VIRTUAL ANALOGUE

Yamaha call the AN1x an Analogue Physical Modelling Control Synthesizer, and it uses the same casing as the previous CS1x. I'm sure that there will be long discussions about the use of the phrase 'Physical Modelling', but in essence the AN1x employs a mathematical model of how analogue synthesis works to produce sounds. The details of the depth of implementation used in Yamaha's Virtual Analogue synthesis technology were not available when I was testing the AN1x, but for the forthcoming full review it should be possible to find out more about whether the mathematical model extends to analogue quirks, such as going out of tune at the top of the keyboard, losing one voice from the polyphony occasionally, and staying on pitch only whilst the external temperature is constant. I must say that

the preview model didn't noticeably suffer from any of these.

Although the AN1x re-uses the CS1x's case — which, in turn, is often compared to that of the Nord Lead — the user interface has been considerably refined. There are now eight front-panel control knobs, and these are assigned to seven pages of synthesizer parameter editing functions, plus one page that you can set up yourself. That's the equivalent of 64 knobs and switches. A couple of extra pages are used for the 16-step sequencer. The matrix of command functions has a rotary switch to select the row, with individual up and down increments to values controlled by the rocking switches. With the synth editing done by eight knobs, there's room for lots of control over what's happening — user-recordable envelopes and MIDI Controllers for 'Vector'-style control, for example.

SOUNDS LIKE...

But how does it sound? It sounds just like a polyphonic analogue synthesizer of old, except that there weren't many polys with quite the synthesizer architecture that the AN1x offers. It is a twin oscillator, multi-mode filter design with separate pitch, filter and amplitude envelopes, as well as two LFOs. There's very little to criticise. It has that authentic warmth, a bass-rattling low end, smooth-rolling Pulse Width
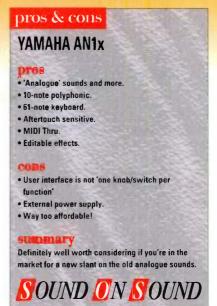
Modulation (PWM) and detunes, plus filters that do more than just filter bits out of the sound — they whistle if the resonance is set too high, and go into oscillation smoothly and predictably. The knobs work as you would expect, and I quickly forgot that I was playing with a digital synth and tried all my old tricks: hitting a sub-self-oscillating filter with fast attacks and decays to a low sustain level, or using PWM, detune, vibrato and chorus to get a slightly thicker sound. Everything worked as expected.

And, also as expected, you get analogue sounds — 128 memories-worth of them, in fact. In the past I have been guilty of describing the range of sounds you can get from analogue synths as something like lots of variations on 'Synth Brass', and there is some of that in the AN1x. But the way in which the instrument works allows some sounds which are well out of character too — some very S+S-like in places. Happily, there is no sign whatsoever of any General MIDI compliance: no grand pianos, telephone rings, drum sounds or wave-sequencing. Instead there are cheesy organs, electric

> "It sounds just like a polyphonic analogue synthesizer of old, except that there weren't many polys with quite the synthesizer architecture that the AN1x offers."

pianos, slushy synth string sections, power leads, smooth synth brass, killer resonant filter basses, moody bass drones, and bright and bouncy synth arpeggio sounds. There are clichés and close emulations aplenty, with a modern edge and without the hassle of analogue's warts.

What you might not expect are the sync and frequency modulation controls, which, on analogue synths, allowed you to make all those tortured harmonic squeals and clangorous sounds — except that, outside of modular synths, few analogue machines and even fewer polysynths allowed you to do FM, and even if you could, the VCOs were often not up to the demands of the job. And it was only on modular synths that

you could apply feedback from the output of the VCA back to the VCF input, which can provide a very nice low-end thickness or less immediately useful 'motor-boating' effects. The AN1x allows you to do this.

Speaking of effects, Yamaha's four-block digital effects processor, with editable Modulation, EQ, Delay and Reverb blocks, is featured on the AN1x. In all, there are quite a few other details that mark this out as rather a powerful analogue synthesizer — but this is only a preview. Suffice it to say that the AN1x is not the cut-down, single-oscillator polysynth of old.

PLAY WITH ME

Performance-wise, the AN1x has the classic Pitch and Mod wheels, with Yamaha's currently favoured wide, deeply ribbed design, plus a ribbon controller. Those eight knobs can act as additional controllers too. The ribbon controller is a dream, with horizontal and pressure outputs, so you can use it as another mod wheel by tapping it, or use it for joystick-style two-parameter control by pressing harder. It's great for controlling the multi-mode filter, sync and detune settings.

The icing on the cake is the keyboard, which does not suffer from the restricted range of 37-note monosynths, or the JP8000's 47 notes. Instead the AN1x's keyboard has a full 61 notes (five octaves) with aftertouch (attack pressure) sensitivity. The light and springy (collapsible rubber domes?) feel is very reminiscent of those big, heavy monsters of the '70s. You can run the AN1x in Unison mode (where it stacks all the available voices for a 'big' sound), Single mode (10-note polyphony) or Dual mode (5 + 5 notes playing two sounds at once). And don't forget that 10-note polyphony is actually markedly better than 8-note polyphony for playing four-note chords because it allows you to accidentally overlap chords without note stealing. ▶

Yamaha AN1x

▶ MAKING A SCENE

One of the neatest performance controllers has to be the two 'Scene' buttons, which are used to select either of two settings of the synthesizer parameters, as set by the control knobs and the modulation routing matrix. It's rather like having either of two separate sounds available for the price of one. But unexpectedly, when you choose both scenes and use the mod wheel, whereas the CS1x cross-faded between the two sounds, the AN1x attempts to morph from one sound to the other. This means that if you have two differently pitched VCOs in the

> "The AN1x has the sounds, the features, and the performance interface of the imaginary ideal polyphonic instrument that I dreamed about back in the '70s."

two scenes, the synth glissandos between them. Some extreme settings don't work perfectly, but simple changes to filter settings can give some very nice evolving sounds which are great for adding an organic feel to arpeggios or sequences.

The step sequencer provides those fixed or transposed 16-step sequences that I bopped to back in the '70s, and the arpeggiator provides bang up-to-date animation of block chords, with contorted timings, swing and gate lengths to play with, to make the result less predictable than boring clocked quarter notes. Using an arpeggiator live is expected, whereas step sequencers usually need setting up beforehand and merely play back live. But with the AN1x's eight front-panel knobs it's possible to control the notes, velocity, gate time and a MIDI Controller for all 16 (or less!) steps as the sequence plays. The arpeggiated notes and the Controller information all appear at the MIDI Out socket.

Nothing's perfect. The preview AN1x that I saw in between the NAMM and Frankfurt music trade shows was nearly complete, but it lacked a full set of factory sounds and a demo sequence. Getting used to the matrix method of accessing functions takes a while, but at least you can see most of the available options — I'm going off systems where page after page of parameters scroll across the display and I get completely lost because none of them are printed on the front panel anywhere. There were one or two bugs as well, but this was a late prototype, and every similar pre-release Yamaha I've seen has had everything I was concerned about fixed by the time time the real models hit the shops — and of course I gave my bug-list and 'this-would-be-nice' additional feature list to Yamaha too!

THIS IS BETTER...

As it turns out, I'm rather glad that I didn't buy a monophonic digital 'analogue' synthesizer for lead lines — my Yamaha VL70m was a much better investment. The AN1x is much the same: it has the sounds, the features, and the performance interface of the imaginary ideal polyphonic instrument that I dreamed about back in the '70s — and it costs less than a third of what it would have then, despite inflation. Much as I love my Sequential Pro One, the lure of polyphony, the sounds, user memories and a 5-octave pressure-sensitive keyboard is very strong indeed. The ultimate accolade for the AN1x has to be my 8-year-old daughter, who also had to be prised off it. If you thought the CS1x was good...   **SOS**

What do the most unlikely number one UK hit single in living memory, a Tascam 688 cassette 8-track, a 1930s jazz sample, Leon Trotsky, *SOS*, Indian music, inverse gender stereotyping, a £35 mic, and feminism have in common? Well, these things are all part of the unlikely universe inhabited by the person who gave Britain its most unlikely number one hit, since, well, records began, as they say on the weather.

Few readers of this magazine will have missed the extreme media hype that surrounded the arrival on the charts of White Town with the infectiously swinging but bizarre track 'Your Woman'. It entered the UK charts at number one in January, sold 400,000 copies, filled hours of radio and TV time, and generated many yards of newspaper coverage. Most people will therefore be aware of how White Town consists of only one man, Jyoti Mishra, a poor, unsigned student from Derby until the end of last year, how 'Your Woman' arrived at its number

white town

TODAY DERBY, TOMORROW THE WORLD!

You've probably heard the amazing story of how Britain's recent number one single 'Your Woman' was recorded by one man, Jyoti Mishra, working alone on an 8-track cassette recorder. PAUL TINGEN talks to the man behind White Town's extraordinary success, and finds out how he put together his new album together using a bare minimum of equipment.

one slot through relentless plugging by Radio 1 DJs, and how Mishra had put 'Your Woman' together in his bedroom on a 4-track cassette deck (the last part of which, as we shall see, is not quite true).

In the process, Jyoti Mishra signed a multi-album deal with a large record company, Chrysalis/EMI, and an album called *Women In Technology* was released in February. "As comic book stories go, things don't get much better than this. Never give up on your dreams", bleats the record company blurb; and in this case it has to be said that hero and history live up to the hype. Sweet dreams, especially those of *SOS* readers, are indeed made of this. By sticking at it for more than 10 years, bypassing the whole UK record industry, recording his crude yet highly entertaining music

on cheap equipment at home, and still coming out tops at the age of 30, Jyoti Mishra has given new hope to scores of closet musicians and home studio enthusiasts around the country. Still reeling from his overnight success, Mishra has clearly not forgotten that only a few weeks ago he was still a member of this vast pool of unrecognised musical talent, many of whom regard Europe's No.1 Hi-tech Recording Magazine as their bible. For when the name of *SOS* appeared on a record company list with several dozen interview requests, he immediately made a tick next to it.

TRUST YOUR EARS

Thus it was that I travelled up to Derby, to visit the brand-new star in his modest house. The chaotic living room looked like a lottery prizewinner's living room, strewn with various pieces of brand new gear — a MiniDisc recorder, phones, fax, and a giant TV — often with manuals and bits of packaging still nearby. Upstairs was Mishra's

modest music room, measuring about 9 by 9 feet. It was similarily chaotic, filled with loads of bits of new and old gear, many of which clearly had yet to find a permanent home. Two bits of legend-in-the-making can be corrected here: the room was definitely *not* Mishra's bedroom, and the cassette recorder he used was not a 4-track, but a Tascam 688 8-track MIDIstudio. Other bits of gear lying around Mishra's home studio included battered specimens such as an Emu Emax II sampler, Roland JX3P, Moog Rogue, and Casio CZ101 synths, Roland TR808 and TR707 drum machines, Mordaunt Short monitors and a Technics SKV amplifier. There were also gleaming new pieces, like a Tascam DA38 digital 8-track, Yamaha 02R mixer, Korg Trinity Plus workstation, and an Akai S3200XL sampler. Everything was covered with leads, manuals, wire, packaging, and bits of small gear (for example Roland's PMA5 desktop music composer, a Casio GZ5, and assorted mics). In the middle of all this mayhem I spoke with the voluminous Mishra, who was rather like his music: loud, bass-heavy, a little crude, and highly intelligent and entertaining all at the same time. After explaining that he agreed to do this interview especially because it was with *SOS*, and stating that he hoped that "a lot of people who read this interview will feel encouraged to keep on plugging on. If I can do it, they can do it", he was immediately onto what is clearly one of his favorite topics: how the gear one uses is immaterial, and ideas and music are what counts. His penchant for

Jyoti Mishra in his compact music studio, surrounded by gear including his new Yamaha 02R, Tascam DA38 and Korg Trinity Plus.

this topic is not surprising, since he's just set music industry received wisdom and gear orthodoxy on its head by scoring a number one hit single recorded on compact cassette.

"I get loads of email — about 800 messages so far — and many people ask things like: 'what gear do you have?' and 'what should I buy?'. But they're on completely the wrong track. It's of no importance whatsoever what gear you use, it's the end result that counts. One independent radio network initially refused to play 'Your Woman', because it was done on a cassette multitrack. As if that matters! These people think that unless you have the most expensive gear, the music is terrible. That's stupid. But then there are people who think that unless your gear is terrible, the music is terrible. That's stupid too. The question should be: 'do you like this song or not?', not: 'what was it recorded on?' I don't care. You should judge things only with your own ears. If my ears say it sounds OK, it's OK. I don't care what anyone else says. Trust your ears. Don't look at the specifications on the packaging..."

SAMPLE CONS AND CONTEXT
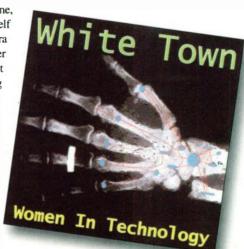
Until November 1996 few music business people were interested in such opinions, and certainly not from Jyoti Mishra. Two months later, scores of journalists and musicians from all over the country are hanging onto his every word. How did he achieve such phenomenal success?

It's an enjoyable tale. Mishra was born in Rourkela in India, and his family moved to Derby when he was only three. He started playing keyboards at the age of 12, and after leaving school,

he had his own business for a while as a music teacher and recording engineer. He showed an early adventurous spirit: "I had become bored with keyboards, so I bought a little acoustic guitar in September 1988, and straightaway booked a gig for February, even though I couldn't play the guitar. Unless you have a fixed deadline, you won't work to it. So I taught myself some basic guitar in five months." Mishra started the group in 1989, as a "proper guitar band" with a guitarist, a bassist and a drummer, and with him singing and playing guitar: "The name White Town was a reference to growing up as an Asian person in Britain. That's not been depressing, but there certainly was a sense of alienation. I come from a middle-class background, and so have always lived in white areas, and felt cut off. The other people in the band were white, but soon they left one by one, and I had to go back to machines to replace them. And so the earlier White Town stuff was machines trying to sound like humans.

"About 3-4 years ago I got bored with this, and finally managed to get enough money together to get a sampler, the Emu Emax II, so I could stop trying to imitate humans, and instead experiment more, go mad and do things like loops and collages of music. I was influenced by hip-hop, Cabaret Voltaire and *musique concrete*, and thought that the creative use of sound in avant-garde was brilliant. It was a little bit like the Marcel Duchamp ▶

JYOTI MISHRA • WHITE TOWN

▶ school of 'ready-made' art: you find an object in real life, and you make it your own by putting it in a different place and context. That idea really inspired me: how you can take a sample, put it in a completely new context, and it becomes an entirely different thing. It's for this reason that I prefer to take my own samples. I paid £60 for a sample CD a while back, and on the back it said that you couldn't use the samples unless you declare them. I thought: 'I've just paid for this, and I still can't use it freely'."

HOW THINGS WENT MAD

Eventually, three years ago, Mishra began studying Sociology and Film and TV Studies at Derby University, a course that he recently abandoned because of the success of White Town. He writes in the sleeve notes of *Women In Technology* that he should receive a "Nobel Prize for patience", and suggests that his breakthrough with 'Your Woman' came as the result of a strongly-honed ambition and many fruitless tries. The fact is, however, that he "completely gave up on getting a major deal between 1985 and 1995. I tried hard in the early '80s, and came close to getting a deal with EMI Music Publishing in 1985. Since major record companies weren't interested, I started my own label, Satya Records, and the EP White Town was the first thing I put out in 1990. It contained a guitar version of the song which also appears, in a different version, on *Women In Technology*. That went round the world via distributors, which resulted in Geoff Merritt of Parasol Records in the USA putting out my stuff. He had no money, but at least it was released. He's put out six White Town singles, and I've had a few releases on French, Spanish, German and Japanese compilations. So there have been plenty of things, but all on an underground level."

Then, in 1996, Mishra was doing some DJ-ing in a club in Derby, and noticed that the dance floor "really, really liked the track 'Your Woman'. People had liked my stuff before, and nobody had ever signed it, but this time I reckoned I'd give it another go. So I sent a copy off to five major labels, like Virgin, Island, One Little Indian and five radio DJs. All the labels turned it down, but one DJ, Mark Radcliffe, started playing it on his Radio 1 show on October 28th. That was nice, but I didn't think something was going to happen, because I'd been on the radio before; John Peel played me on his show once. But when Mark Radcliffe kept on playing the track I wondered whether something might happen after all. It was a strange situation, for I hadn't joined the PRS yet, and had no contract, no management, no

plugging, and my track was being played regularly on Radio 1. So I sent off to several major labels again, like Virgin and so on, saying that I was on Radio 1 and people wanted to buy the single — but they were still not interested. Who knows whether they listen to Radio 1? But when Mark Radcliffe took over the breakfast slot from Chris Evans and kept playing the track, things went really mad, and the response couldn't be ignored anymore."

Suddenly "about eight" major companies were queueing up to sign White Town, an experience which Mishra described as "weird, to be chased after all these years of having had no interest." Just before Christmas 1996, Mishra signed with Brilliant! Records, Neil Ferris's label, which is associated with Chrysalis/EMI. Ferris was the first major person to get in touch with Mishra, and he signed with Brilliant! because "they gave me the most creative freedom." Brilliant!/Chrysalis released the EP >*Abort, Retry, Fail?*_, which featured 'Your Woman', on January 13th, and

The gear that got Jyoti Mishra to number 1: Roland JX3P (with PG100 programmer), Mood Rogue, Casio CZ101, and Emu Emax II sampler. Also pictured are a Novation BassStation and the new Akai S3200XL.

days later it entered the UK charts at number one. The crazy charm of the single and the unusual way in which it was made and became popular propelled Jyoti Mishra to instant fame, and much unwanted media interest for him and his family. It got so bad that he now wants to move to a new house as soon as possible, not just to spend his freshly-earned money, but also because he feels ▶

▶ too exposed in a residence which is now public knowledge. "With my studio here, it's like hanging a sign outside saying 'rob me!'. But, as Mishra writes in the liner notes of *Women In Technology*, "the next album won't be a wingeathon about the burdens of money and fame." So far, he's clearly enjoying his new status far too much.

MOCKERY

Mishra is clearly grinning from ear to ear about how he got to where he is. The way 'Your Woman' became successful happened outside of his control, and so he relishes most the bit he *was* responsible for: the music. "The whole EP >*Abort, Retry, Fail?_* and half of *Women In Technology* was recorded and mixed on the Tascam 688 using dbx noise reduction, and an Alesis Microverb 2 and Boss ME5 guitar effects pedal were the only effects used. "Most people reading *SOS* have better gear than I had! I don't like running virtual tracks on the sequencer, and always record whatever I sequence to tape — when I want to listen to something, I don't want to have to spend hours loading it up and finding the right sound and effects. So everything you hear on these tracks was actually recorded on cassette tape. I mixed them to a Sony DTC750 DAT player.

"The sound sources I used for the EP and the whole album were the Emu Emax II sampler, a Roland JX3P and TR808, a Moog Rogue and Casio CZ101 — these are both good for basslines

— plus two cheapo guitars: a Jim Deacon £100 acoustic and a Maya electric. The sequencing on the tracks 'Your Woman', 'Undressed', 'The Shape Of Love', 'Going Nowhere Somehow' and 'The Death Of My Desire' was done on an Atari 1040STFM with Gajits' *Sequencer One* software, which came free with an Atari magazine. The sequencing on the other album tracks was done on an Escom PC with *Cubase* software, which I got about 18 months ago. It was a nice little computer, but it just kept crashing. The hard drive was crap — it kept throwing the words '>Abort, Retry, Fail?_' at me whilst I mixed the EP, which is why I decided to use that as its title."

Mishra also obviously enjoyed telling me the next fact: "Did I tell you that I used only one mic for recording all my vocals? It's a cheap Tandy mic, the Realistic PZM, which cost only £35. I put the mic straight into the Tascam 688. I also recorded the acoustic guitar with the PZM — though I DI'd the electric. The track 'A Week Next June' is just me on acoustic guitar and vocal, with an electric guitar overdub by Rob (Fleay). I recorded the whole track in one take, just with the PZM. So I had to position it somewhere in

White Town

>Abort, Retry, Fail?_
Your Woman

Four Track CD Single

front of me and hope that it would catch both vocals and guitar. I didn't want to use two mics, because you have to work out phasing and placement and mic EQ and so on. I thought: 'bugger all that, it's just going to get in the way of the performance.'"

"The more, or the better, mics you have in front of you, the more you have to alter what you normally do. When I started to record the second part of the album, Brilliant!'s Neil Ferris, who has been a BBC engineer, asked me whether I'd worked with different mics, and gave me a Neumann U87 to try. I gave it a go. But the floorboards creak in this room, and when I had set up the Neumann with all its protective shielding and elastic cradle, it picked up the creaks every time I moved when I sang. And there was a bloke doing concrete mixing outside, and it would pick him up as well. When I switched the U87 to hypercardioid pattern so it would be more directional, it lost me every time I moved and drifted off-axis. But I'm used to putting emotion in my singing, and moving around — I close my eyes and ▶

HOW MISHRA RECORDED 'YOUR WOMAN'

White Town's 'Your Woman' must be the most primitively-made track ever to reach number one in the UK charts in recent years. The recording gear used consisted only of a Realistic PZM mic, the Tascam 688 8-track MIDIstudio, the Sony DTC750 DAT player, and the Boss ME5 guitar pedal. Sound sources were the Emu Emax II for drums, keyboards and samples, Casio CZ1 for basslines, and Maya electric guitar — and the finished song only filled only five tracks of Mishra's Tascam 688. Mishra explained how he mixed all the ingredients together, starting with the main ingredient, *that* ancient orchestra sample: "It's taken from a 1932 recording of the Lew Stone Band, with Nat Gonella on trumpet, playing a song called 'My Woman'. It inspired both music and lyrics of my song, for the original song was so anti-woman that I wanted to twist it another way. Also, I love the music from then. I heard this track first as a child, and went back to it once I had the Emu Emax II sampler."

The other striking sample on 'Your Woman' are the bleep noises in the break, which were taken from the ancient, early '80s Casio VL1, which many will remember for its tiny dimensions, toy keyboard and white colour: ("It was the first thing I ever got. I was so impressed because it had ADSR and envelope and you could make your own sounds"). Mishra sampled it onto the Emax II and then flew it into the track. Mishra's strangely disembodied voice on 'Your Woman' was an attempt to make his voice sound like it came from an old 78rpm record: "It was recorded

normally with the PZM mic. I rolled off the bass and top, and then stuck it through the Boss ME5 guitar pedal. I had it slightly overdriven, though not distorted. I didn't use any reverb on the vocal. In fact, there's no reverb on the whole track."

Your Woman does really swing, and Mishra explains that he achieved the infectious beat by applying his 'imperfection' credo in very crafty ways: "The most interesting thing in life are always the imperfections. Perfection equals lifelessness. Machines will always play things perfectly, but only nature, and in particular humans, have the capability for getting things wrong. When making 'Your Woman' it took me ages to program my equipment to play slightly out of sync. If you listen to the rhythm break in the middle, the drums actually go out of time underneath the Casio VL1 noises. It took me a long time to get that right. I don't like the sound of things being really in time, because there's no groove. I pull things backwards and forwards in the sequencer, or I try to corrupt the sync code, seeing if it will drop tempo a bit, but not too much. On 'Your Woman' I corrupted the drums using the Tascam 688's varispeed control. The 688 has its own sync code on track 8, which triggered the Atari, and so I would fiddle with the varispeed as I was laying the Emax II drums onto tape, and get the drums to go slightly off-beat. I then recorded the other instruments in time. With the drums being a little bit out of time throughout the song, you don't really know what's going on."

▶ don't want to worry about anything. The Neumann didn't catch what I was doing, so I returned it, and switched back to using the Realistic PZM."

FRUITS OF SUCCESS

Those of you who have just traded your limbs for a pile of expensive gear, don't despair. True to his credo that 'it doesn't matter what gear you use, it's the end result that counts', Mishra is quick to dispel the growing media myth that he's some kind of champion of low-fi recording: "That's a made-up thing. I'm against low-fi-ness as a principle. I don't try to *sound* low-fi, I use gear to get the result I want, and work at home because I hate recording studios. Music made in studios tends to sound the same. When you start being able to listen to a record and go: 'ah, that's Lexicon reverb', or 'oh, that's U86 close-miked with a touch of AMS', it gets a bit depressing. I'm not knocking people who work in studios, but they're there to do a job, and not necessarily to be creative. And sometimes they get bands in who can't play or write songs, and they have to do everything for them, and the result ends up being full of safe sounds, polished and well-produced, and without clicks and hums and buzzes, but also without humanity, because it's so perfect."

Imperfection is an important aspect of the White Town universe, and Mishra spends substantial amounts of his time programming his machines to

"Yes, I really did record a number 1 hit in this room..."

play things imperfectly (see 'Your Woman' box). It's for the same reason that he prefers to use analogue synths ("I don't like the sounds of most new keyboards. They all sound like *Baywatch*, like American stock film music, with their bell-like sounds and the same presets that everybody else uses"), and takes his own samples. Yet he clearly believes that he can make the music he wants to make with many different types of gear, for his home studio was graced with some of the fruits of the success of 'Your Woman'. Recent new additions were the aforementioned Yamaha 02R

digital console, Tascam DA38 digital 8-track recorder, Korg Trinity Plus workstation, and Akai S3200XL sampler, as well as a Novation BassStation rack, Panasonic SV3800 DAT recorder, and *Cubase* running on a Texas Instruments laptop PC. And apparently, Mishra completed half of *Women in Technology* (tracks 2, 3, 5, 8, 10, 12) using this equipment: "The other six songs were already finished before I signed the deal, whereas these six were finished during a four-day period last Christmas, straight after I signed with Brilliant! I had already laid out the ideas on the 688, then I

> ## "I don't like the sounds of most new keyboards. They all sound like *Baywatch*..."

copied them across to the DA38, and mixed them with the 02R. The 02R saved my life over Christmas because it's so quick. It's a very musical desk that's very easy and fun to use, and what impressed me most is that it had built-in gates and effects on every channel. I was a little scared when I got the 02R, thinking: 'ooops, digital console, digital EQ, automation — what *is* it going to sound like?', but the new gear didn't make much difference to my sound. It captures all the mucking about that I do, and gives me extra options to sound madder. That's why I don't think I'll sound cleaner with the new equipment. I don't think I'll be buying any more new gear, but I do look forward to going crazy with what I have in the future."

INFLUENCES

Listening to *Women In Technology* it's striking how there's no distinguishable difference in sound or production quality between the tracks exclusively done on the 688, and those finished on the DA38 and 02R. If anything, the tracks that Mishra finished last Christmas are more experimental and brutal. The original 688-only tracks contain the excellent pop song 'Undressed' and the best and most catchy track of the album, 'Going Nowhere Somehow' (strangely not chosen as the second single), which both sound almost slick. Of the 02R-mixed tracks, the new single, the rather unwieldy, unmelodic hip-hop-influenced track 'Wanted', as well as the bizarre song 'Thursday At The Blue Note', are both carried along by fat, wildly-distorted synth sounds. Mishra explained: "I get a lot of noise from putting samples and synth sounds through the Boss ME5, which is a very useful little effects box. In 'Wanted' I even created noise by feeding the ME5 back on itself. The synth on 'Blue Note' is a Moog run through the ME5. I also put drum sounds through the ME5, because the problem with samples is that they exactly sound the same each time they're played, whereas if you put them through analogue distortion they will be slightly different each time. ▶

JYOTI MISHRA • WHITE TOWN

> ❝...I'm not going to think about what music is most popular, because once you start thinking like that, you start writing crap.❞

Jyoti Mishra can be sent email at: white.town@dial.pipex.com. His web page can be found at: www.white-town.com

▶ It makes things sounds more live. Samples sound very wooden otherwise."

'Thursday At The Blue Note' contains some Indian music samples, which brings up the issue of Mishra's Indian roots, and how they are represented in his music. *Women In Technology* comes across as a collage of entirely Western music styles, with little or no obvious world music influences of any kind, let alone Indian music. According to Mishra, the Indian influence is very strong, but lurking in the shadows: "It's all about a particular way of working, of having a certain attitude. For me, Indian music isn't about the sound of it, it's more about the underlying ethic. The instrumental tracks 'Theme For An Early Evening American Sitcom', 'Theme For A Mid-Afternoon Game Show' and 'Theme For A Late-Night Documentary About The Dangers Of Drug Abuse' are my versions of Indian classical music, where different ragas are played depending on what time of day it is. That works in India, because people there are more in tune with the natural cycles of life. When I tried to translate that concept into Western terms, I realised that we live our lives by TV times."

The strongest Indian influence on the album is, according to Mishra, conceptually and lyrically. "In Indian culture the family, love and sexuality are very important. Sex has to be within marriage, but it's not taboo. And so *Women In Technology* is about gender and sexuality, about love, and about how technology affects the way we feel about things and each other. I'm influenced in my ideas about sexuality by Wilhelm Reich, who wrote the book 'The Function Of The Orgasm', which is also the name of a song on the album. My influences in writing are Wilhelm Reich, Rosa Luxenburg, Trotsky, and American feminists like Andrea Dworkin and Linda Williams, and so on. Dworkin writes that any penetration in our society, where there's still not full equality between men and women, is rape. As a man, if you accept her point, how do you make love to a woman? Those are the issues I look at; I try to fuse art and politics in a way that isn't preaching."

Of his future musical plans, Mishra admits, "I'm not going to think about what music is most popular, because once you start thinking like that, you start writing crap." The next White Town single is, therefore, the decidedly uncatchy track 'Wanted', chosen to "defy hit parade expectations", and will be remixed by the likes of Daniel Miller (head of legendary independent Mute Records), Vince Clarke, Martin Ware (ex The Human League, BEF and Heaven 17) and Ant Chapman (of Collapsed Lung). Apart from musings about doing a live show and film and TV work, Mishra's main attention is on moving to the new, safer house, which will also give him more recording space. And, finally, isn't he scared that he will turn out a one-hit wonder? He laughs: "Who cares? I'm glad many people have heard my music, but I'm not in it for that, I'm not after fame. I'm after making music I love and having some connection with people. Thanks to the single I can now be financially OK, and that means that if anything, I can go even madder, because I don't have to worry about money." **SOS**

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It's no surprise that Sony DAT recorders are the No.1 choice of recording and mastering studios the world over. After all, Sony invented the format.

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I f you've been stuck with a cassette-based multitracker for years, and have been reading *SOS* articles on digital recording and editing with a distinct greenish tinge in your eye, this month's competition is for you. The Sony MDMX4 MiniDisc digital multitracker is as simple to use as a cassette-based multitracker, but lets you totally rearrange the material you record on its four* tracks at the touch of a few buttons, by non-destructively editing the table of contents (TOC) stored on the disc. Bored with your chorus where it is? Want to hear what the bridge would sound like as an intro? On your old cassette

Sony MDMX4
MiniDisc Multitracker

questions

1. How many tracks are offered by the MDMX4 when recording to a MD-Data disc?
a. 2 ☐
b. 4 ☐
c. 1 ☐
d. ... er... green! ☐

2. What does TOC, in the context of the MDMX4, stand for?
a. Trade Onion Congress ☐
b. Tiverton Ocelot-owners Club ☐
c. Table Of Contents ☐
d. Thermal Oscillator Conversion ☐

3. How many bands does the MDMX4's EQ section have?
a. 3 ☐
b. 2 ☐
c. 1 ☐
d. Sergeant Pepper's Lonely Hearts Club Band, plus support ☐

4. What is the MDMX4's shuttle wheel for?
a. Keeping badminton scores ☐
b. Generating hydro-electricity ☐
c. Wrist physiotherapy ☐
d. Scrolling through the MiniDisc contents ☐

TIE-BREAKER

Sony's famous portable cassette player was entitled the Walkman. If you had to find a similar snappy title for the MDMX4, what would you call it, and why? Anyone who tries 'MiniDisc-based Digital Multitracker' will be disqualified. Please answer in not more than 30 words.

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Name ....
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Post your entry to: SOS Sony Competition, *Sound On Sound*,
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Would you like to receive further information on
Sony products? If not, please tick this box. ☐

Sony MDMX4
Competition

multitracker, finding out what your finished song would sound like could take considerably more than two shakes of a lamb's tail — more like the time it takes a sheep to knit a woolly jumper — but on the MDMX4, it's the work of a couple of minutes.

There's another big advantage to digital multitracking too; the improved sound over cassette. There's no need to lose quality when mixing down to stereo; you can bounce down internally from four tracks to two on the same disc (provided there's enough space left). Add to these considerable plus points all the features you'd expect on a fully-featured cassette multitracker, such as XLR *and* jack inputs, 3-band EQ, two auxiliary sends, MIDI Time Code (MTC) and MIDI Machine Control (MMC) compatibility, and comprehensive bargraph metering, plus a jog/shuttle wheel to help you move around your compositions more easily, and you have a serious piece of kit. There's only one drawback to the

MDMX4, really — it costs a thousand quid. OK, so this isn't bad going considering its features, but it's still enough money to have you — or possibly your bank manager — reaching for the smelling salts.

Fortunately, help is at hand. As you've probably guessed by now, *SOS* have teamed up with Sony and their UK distributors HHB to give away an MDMX4 in this month's great competition. To enter, simply answer the questions on the left, complete the tie-breaker in a breathtakingly amusing and witty fashion, and then post the entry to the address below so that it arrives at the *SOS* offices no later than the competition closing date, **Friday, May 2nd, 1997**. You have nothing to lose, and everything to gain. Well, a digital MiniDisc-based multitracker, anyway — and that's a start.

*MD-Data discs required for 4-track operation.

Prize kindly donated by Sony Broadcast & Professional UK (01932 816000) and HHB (0181 962 5000).

the small print

HARD DISK for the HARD UP

HINTS & TIPS ON HD RECORDING WITH THE AKAI S1100 SAMPLER

Akai's S1100 hard-disk recording option caused quite a buzz on its release, and even now makes this well-specified sampler even more versatile. CHRIS CARTER passes on some hard-won tips for making the best of S1100 HD recording.

Until quite recently, the question we were asked most often by visitors to our studio was "Where's the tape machine?" Like many musicians who record at home, we started with various Tascam and Fostex tape machines and have tried them all, from cassette multitrackers to reel-to-reel 2-, 4-, 8- and 16-track machines. As most hard-up musicians know, the running costs on a 16-track tape machine can be a real burden and you're tempted to start 'economising' by re-using tape and skimping on servicing — both big mistakes.

About five years ago our 16-track Fostex tape recorder and Akai S950 sampler both desperately needed replacing, and we took the decision to sell them and change over to a MIDI-based hard disk recording system. After months of research, we concluded that the limited systems then available were far too expensive and we almost decided to stay with tape. Fortunately, we were offered a new Akai S1100 and S1000 at a price we couldn't refuse. The S1100 was launched in 1991 as a replacement for ▶

Hard Disk Recording with the Akai S1100

the highly respected but ageing 16-bit, 16-voice S1000. The principal differences between the two machines are an improved audio system on the S1100, with 24-bit processing, the inclusion, as standard, of a SCSI interface, a digital effects board, an AES/EBU digital output, a SMPTE interface, and a hard disk recording function (introduced with the version 2.0 software). We decided to take the plunge and began a fretful transition from tape to disk, courtesy of the S1100's HD option. After a couple of early catastrophes while recording vocals onto a
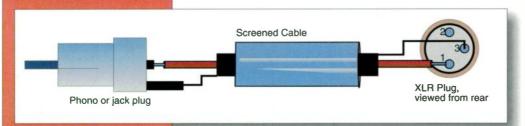
than any amount of later editing or tweaking. A good microphone technique is also encouraged — try to get as high a level as you can sung into the mic, and if your vocalist has a soft or quiet voice try to use an active or phantom-powered microphone, as these usually produce a higher output level. This will reduce the need to turn up the input gain too far, because while the input preamps on the S1100 are very good they aren't totally transparent, and increasing the input levels will eventually introduce unwanted noise. If possible, don't put the mic through a mixer first, as the mixer noise level, even if low, will also add more noise to the S1100 preamps. I use an old Sony ECM-56F electret condenser microphone that can be powered by a mixer or a battery but sounds particularly good when running on new batteries and plugged directly into the S1100's XLR input — no hum and no noise. Although the S1100 jack inputs

Screened Cable

Phono or jack plug

XLR Plug, viewed from rear

Syquest removable disk (quickly replaced by a more reliable optical removable disk drive) we eventually developed an efficient, fast and very reliable system under the control of a MIDI sequencer and mixing down to DAT. While this method of recording may not be to everyone's taste, we found it a pretty painless transition. The S1000/S1100 series of samplers are well known for their ease of use and this, in my opinion, accounts for why they have become an industry standard. Even so, there are hidden depths to the S1100 and a lot of parameters to wade through, and many people just use the basic sampling, editing and playback functions — so if you're considering HD recording, and have access to an S1100, the following tips could help you achieve some rewarding results, though they should also be applicable to users of later Akai samplers with HD recording facilities. For the purposes of this article I will assume that most readers have a basic working knowledge of the S1100 version 4.3 operating system.

RECORDING VOCALS

When it comes to vocals, a decent microphone will make more of a difference to the recorded sound

have more gain available than the balanced XLR inputs they are best avoided for use with microphones, as they pick up mic hum more easily and (because of impedance mismatching) the tonal characteristics are not as well suited to vocals. Other options for microphone recording could be to use a high-quality stand-alone preamp or vocal processor to add EQ, valve warmth, compression, limiting or gating.

It's worth spending some time setting up the input levels correctly on the DD RECORD page (EDIT SAMPLE>DD>DREC>TAKE) before you begin recording. This is because the 'linear' level display doesn't show the correct levels while the S1100 is in DD record mode. For some reason, it always shows the input levels about 30% lower than they really are, and if the input level control is set too high, serious digital clipping will occur. Make sure you know what your loudest peak is likely to be and mark the level control with a wax pencil as your absolute limit for that session.

Any S1100 HD recording works best when running in parallel with a MIDI sequencer. The S1100 DD record mode defaults to note C3/60 on MIDI channel 16 for its HD/DD record/playback trigger. ▶

Hard Disk Recording with the Akai S1100

▶ The note should be placed a couple of seconds in front of where the S1100 will drop into record or playback. This forward delay is in addition to the default S1100 pre-delay of 500ms and allows the hard disk plenty of time to jump into action before the recording begins. The MIDI note, or the track it is on, should be locked or isolated so that any successive playbacks always remain in sync. If you intend to play back multiple takes, different MIDI note numbers can be assigned to each take on the DD PLAY page (EDIT SAMPLE>DD>SONG>S.ED), but remember that only one take (either mono or stereo) can play at once. An alternative way of playing back multiple takes simultaneously is outlined below.

TRANSFERRING DD TAKES TO RAM

If you are playing back a lot of different takes that need to be butted very close together or overlap each other, this becomes impossible using the HD/DD recording feature alone. Over the years I've developed a technique for transferring S1100 DD takes into the sampler RAM for better manipulation and control. To achieve this at the highest quality with no loss and no noise, an Akai IB104 digital audio interface must be fitted to your S1100. Using this interface, it's possible to save DD takes to DAT and then digitally load them back into the sampler RAM for editing and keygrouping. A lot of memory is essential for this procedure, with 8Mb RAM the minimum, 16Mb recommended and 32Mb an ideal configuration.

- The first thing to do (particularly if you only have 8Mb of RAM) is choose only the takes that are essential and save these to DAT, either one at a time or in bulk. This is accomplished using the ONE or ALL buttons on the TAKE BACKUP page (EDIT SAMPLE>DD>PLAY>BU.S). Connect a DAT machine to the IB104 interface, using the co-ax or optical connectors, and begin the backup (see the 'Stick to 44.1kHz' box). As the backup proceeds, mark your DAT tape with ID numbers to help guide you through it when you play the tape back later.

- Next go to the DIGITAL INTERFACE page (EDIT SAMPLE>REC1>DIGI) and set the source to DIGITAL and the input to either ELECTRICAL or OPTICAL, depending on the type of connections your DAT machine has; leave the receive rate at AUTO.

- Now go to the sample RECORD page (EDIT SAMPLE>REC2) and set the parameters as you would normally for: NEW NAME, STEREO or MONO, SAMPLE LENGTH and PITCH, and so on. The input level doesn't need to be adjusted, as you're recording from a digital source. The S1100 display should indicate that it's receiving at 44.1kHz or 48kHz, depending on the output of the DAT machine.

- Play back the DAT tape and record the previous DD takes into the sampler RAM a section at a time. At the beginning of each take you will hear a very short burst of digital data — this is irrelevant information that can be edited out on the sample TRIM page (EDIT SAMPLE>ED1). The takes can also be edited into shorter blocks, deleting any silences or pauses in the process to save RAM space.

Once the vocal takes have become samples, a wealth of editing facilities is available to you — retuning, stretching, squeezing, reversing, combining, looping, and so on — and, if you have access to a Mac or PC sample editor, other functions, such as EQ and level re-scaling and special effects, could be used.

RAM BACK TO DISK

When you've assembled your re-sampled takes, they can be put into keygroups, and if you have sufficient RAM it's possible to have 20 or 30 vocal phrases spread across a keyboard. Using a MIDI sequencer you can now arrange and rearrange the vocal takes with ease on a keyboard. Vocal takes can be cut and pasted on screen if you're using a computer-based sequencer, timing can be adjusted and shifted, and takes can be overlapped and double-tracked.

If the S1100 is a major part of your setup, it could be pretty inconvenient having the sampler RAM full of vocals. One of the most useful features of the S1100 is the ability to play back samples and stereo HD takes simultaneously. An often-overlooked part of this duality is the ability to mix down the contents

of the RAM — samples, keygroups, and so on — onto the hard disk. To achieve this:

- Prepare the MIDI sequencer to play back the rearranged and edited vocal takes, and include a separate note (C3/60) on MIDI channel 16 to trigger the S1100 DD record/playback function, as mentioned earlier.
- Put the S1100 into DD record mode, play the sequencer and record your samples onto the hard disk.

The sampler RAM is now free for loading in instruments, percussion, or whatever. With this arrangement it is possible to have a stereo mixdown of vocals (or instruments) playing back from the hard disk on outputs 7 and 8, with individual outputs 1-6 and the stereo L/R outputs available for more instrument samples, without any loss of polyphony.

AND FINALLY

Many of my comments on vocals can also be applied to other recordable sources, acoustic and electronic. If carefully recorded there is little difference between a DAT recording and an S1100 HD/DD recording, and with its real-time stereo digital output the S1100 is ideally suited to digitally recording your work into any S/PDIF-equipped DAT machine, digital mixer or digital soundcard (PCI, NuBus, etc).

Second-hand S1100s seem to hold their prices quite well and are not seen in classified ads as often as the S1000, as satisfied users appear to hang on to them for longer. Currently you can get hold of an S1100 for around £1000 to £1300 depending on its condition, the amount of RAM and whether it has a IB104 card. Points to look out for when buying an S1100 second-hand are what operating system it has (currently v4.3 and preferably in ROM for much faster booting), whether the display is nice and bright, and whether it comes with a copy of the revised instruction manual, which is pretty important if you want to get the best from the machine. [If you own, or find, an S1100 which doesn't have the software with the HD option, an approved Akai service centre can supply a new EPROM with the latest software. Panic Music (01954 231348) charge £45 for this service. Thanks to Adam at Panic for his help.]

When you consider that the Akai S1100 is a superbly specified industry-standard sampler with probably the largest sample base in the world and a stereo hard disk recorder, you begin to appreciate what a bargain this machine really is. SOS

TRIGGERED SYNC

Unusually, the S1100 doesn't use a timecode to stay in sync while in DD mode, unless you use the internal (or an external) SMPTE generator to play takes from the QLIST. Instead, the S1100 relies on the timing accuracy of the connected hard disk and MIDI sequencer. I've used various sequencers, both software and hardware, from different manufacturers, and on the whole they stay in sync to the same degree as do hard disks. While writing this I tried an experiment with a drum pattern recorded from a MIDI sequencer onto the S1100 HD with the DD record function triggered by a MIDI note at the beginning of the pattern. I played back the sequencer and the S1100, triggering the DD take from the same note, and apart from some slight phasiness the rhythm patterns were still in sync after eight minutes. Pretty impressive!

English Channel

JOE MEEK VC1 STUDIO CHANNEL

PAUL WHITE studio tests the new Joe Meek VC1 and finds that nostalgia is everything it used to be.

While other retro designers scour the earth for supplies of long-discontinued valves, Ted Fletcher's Joe Meek boxes rely on photo-resistive gain control devices to recreate the '60s compressor sound and, so far, the range has had tremendous success. Though the basic compressor circuitry used in these designs is based on a concept developed by Joe Meek, the legendary '60s producer probably best known for his involvement in 'Telstar' (by the Tornadoes), Ted Fletcher has brought the design up to date, giving it a faster response, better audio performance and more predictable control operation. The latest green eyecatcher in the Joe Meek range, the VC1 Studio Channel, brings together various elements used in previous Joe Meek units and bundles them into a 2U, single-channel rackmount processor.

It seems that hardly an issue of *SOS* goes by without including some form of 'direct to tape' channel processor, but it's easy to see why the concept has caught on as well as it has. By the time a mic signal has fought its way through the channels, routing busses and groups of a typical budget console, it's usually starting to look a bit dog-eared. If you use a dedicated 'channel' device comprising a mic amp followed by additional processing, a mic signal can be amplified, EQ'd, compressed, enhanced, and even put through an expander gate, without ever seeing a mixer.

Of course, the available processing depends on the type of channel device you buy. The VC1 combines a mic preamp, a compressor and an enhancer in a single 2U package. In true Joe Meek tradition, it's also about as green as green gets. I once asked Ted about the choice of colour, and he told me that when the original prototypes were being built for launch at a trade show, they had to use car spray paint to get the job done quickly. The colour just happened to be green, but people liked it so much that the company decided to stick with it.

VC1
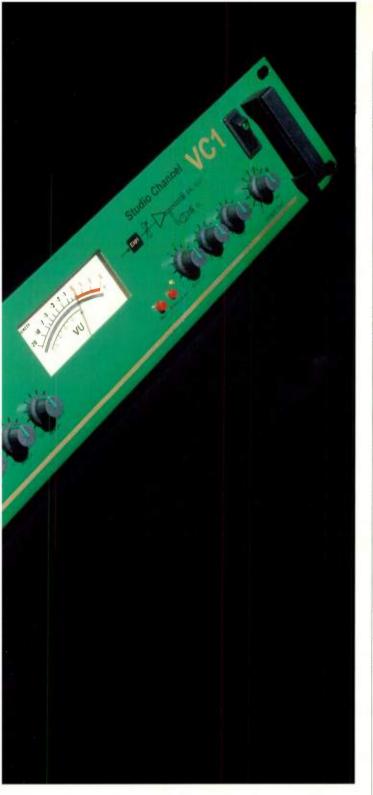
Unlike the majority of mid-priced console mic preamps, the VC1 uses a traditional transformer input stage followed by a two-stage amplifier, an approach that makes it possible to build very quiet amplifiers. On paper, the noise performance looks about the same as any other mic preamp, but that can be misleading. Most mic amps are specified at maximum gain where their noise performance is best, though what matters more is how they perform at everyday gain settings. The frequency response is nominally flat from below 10Hz to over 20kHz, to produce a flat phase response, especially at the LF end. I'm surprised that the HF end doesn't extend further, though.

A wide range of mic gain is available — from 15 to 70dB, in fact — but there's also a balanced line input jack and a further unbalanced instrument jack input (150kΩ impedance), with up to 35dB of gain available. The mic input XLR is duplicated on both the front and rear panels, while the Instrument In jack is on the front panel and the Line In jack is on the rear panel. An unbalanced TRS insert jack comes directly after the mic preamp, and there's also a Mix input jack that allows a line signal to be mixed with the output of the preamp stage. The insert would be useful for patching more comprehensive EQ into the signal path, though there's an argument for adding EQ post-compression, so it might be better to patch any further EQ between the output of the unit and the input of the recorder.

The Input Gain control is fully variable and covers a 60dB range when used as a mic preamp, or 35dB when used as a line amplifier. Mic operation is selected by means of a button of the same name, and an amber status LED confirms that mic mode is active. Further switches activate phantom power, high-pass filter (12dB/octave at 25Hz) and the compressor stage, each having an associated status LED. As far as the controls are concerned this is a perfectly conventional preamp stage, except for the omission of a pad switch. I suspect that, with the distributed gain preamp circuit used here, the pad has been omitted because there is sufficient headroom to render it unnecessary.

Based on the same photocell and LED gain element as the other Joe Meek units, the compressor has a soft characteristic, so that the ratio increases progressively as the signal approaches the threshold. A separate ratio control is also provided to set the target ratio at maximum compression, so once a suitable ratio has been chosen, setting up is simply a case of altering the Threshold, Attack and Release controls. However, there's no auto attack/release mode, ▶

Joe Meek VC1

▶ which can be useful in circumstances where the input dynamics vary a lot. A large meter shows either gain reduction or output level, but there's also a gain reduction LED between the Ratio and Attack controls to provide a permanent, extremely visible indication of compressor action. (See our Sound Workshop feature on compression in this issue for more details on how compression works and what all the controls do.)

This compressor is based on older designs which tended to compress properly only over a limited region, so that louder transients could still get through without being, in effect, clamped. The subjective result is generally more transparent and dynamic than conventional VCA designs, some of which tend to make the material sound dull or 'squashed'.

The final processing stage comprises an enhancer based on the dynamic equalisation principle; the meter mode switch is also located in the enhancer section. Rather than adding harmonics or controlled distortion, this enhancer comprises a variable-Q filter, the output of which is compressed

"It's quality is significantly better than you'd expect from most mid-priced consoles."

and then added back to the original signal. According to the manual, the Drive control affects both the degree and 'tone' of the enhancement — a bi-coloured LED indicates when the amount of drive is about right. The Enhance control is described as setting the amount of enhanced signal mixed back into the main signal path. However, I think the Enhance and Drive control labelling may have been reversed on the screening of my review model, as Enhance comes first in the row of controls and seems to function in the way Drive is described. Similarly, Drive comes at the end, where you'd expect the Mix control to be on a traditional enhancer, and it seems to fulfil a similar function in affecting the amount of processed signal added. Hopefully this will be sorted out in production models — if, indeed, I have interpreted the situation correctly. The Q control sets the sharpness of the filter; in the manual, this is said to affect the duration of high-frequency harmonics.

Finally, there's an Output Gain control, designed to compensate for any gain loss caused through compression. Unusually, three different output formats are available, to allow the VC1 to interface with most types of audio equipment. A quarter-inch TRS jack provides a balanced line output, while an XLR delivers a transformer-balanced, low-impedance, DI-style output. There's also a 200Ω, unbalanced jack output at -20dB for connection to domestic and semi-pro recording equipment. The balanced output may be used unbalanced, providing that the 'cold' leg is grounded.

IN USE

On its own, the mic amp has a warm, clear sound but without quite equalling the same 'airy' clarity of some esoteric designs. Even so, considering that this whole unit costs less than a single high-end mic preamp stage, it actually performs very well, and its quality is significantly better than you'd expect from most mid-priced consoles. It's certainly a very quiet preamp and it has plenty of headroom. Applying a little gentle enhancement restores that sense of air around the top end, and in a much more natural way than most harmonics-based enhancers I've come across. Used sparingly, the enhancer behaves just as you'd expect a good HF equaliser to behave, adding a sheen to the signal that wasn't evident in the original. A midway setting of the Q control seems to produce a very natural result on vocals.

As for the compressor, this is classic Joe Meek stuff, and while milder settings are perfectly competent for benign dynamic range reduction, the compressor really comes into its own when it's provoked to the edge of pumping, where it introduces a sense of energy and excitement, but without trampling all the transient detail to death. There's no doubt that this compressor is built for character rather than accuracy, but for rock and pop vocals it works really well. If you want invisible gain reduction, look somewhere else!

SUMMARY

If you've used a Joe Meek unit before, you'll know pretty much what to expect from this one. What I really like about it is that all the effects it produces are effortlessly musical. Setting up is quick and easy, the enhancer section does all that a good HF equaliser does — and more — and the compressor keeps vocals lively and up-front. Having a choice of three input and output types adds greatly to the flexibility of this model, and a lot of thought has gone into the design to make the VC1 feel a lot less complicated to the user than it really is.

Though the VC1 is predominantly a vocal processor, it is also effective on most instruments, and the provision of a line input means that off-tape signals can be processed back through the unit when necessary. The instrument input is also useful for treating keyboards, samplers, or active guitars and basses, but the impedance is too low for serious use with passive guitars and basses unless a suitable DI box is used first.

If you want something that will add to your sound in a flattering and distinctive way, maybe it's time you tried out one of these for yourself. In any event, put it on your shortlist and compare it with the competition. **SOS**

MIDI Moves

TRANSFERRING SONG DATA BETWEEN MIDI SEQUENCERS

Need to transfer songs between an old sequencer and your new computer? Or between a sequencer at home and a MIDI File player for live work? VIC LENNARD explains the procedure.

Sequencers have come a long way from the days when they really *were* sequencers — a set of simple steps of 16 or 32 notes with no change in level or note length. Years ago, many synths had their own on-board sequencers and the scenario of needing to move a sequence from one synth to another simply did not occur. How times have changed. The combination of MIDI, the Atari ST and Steinberg's *Pro 24* brought the affordable creation of music to the masses. The Atari ST was the perfect computer platform for two reasons: the in-built MIDI ports, and a floppy disk drive for data storage. Many sequencing programs followed in *Pro 24*'s footsteps, including, in the early days, C-Lab's *Creator* and Dr. T's *KCS*. This led to a situation wherein you often found a different sequencing package in each pre-production studio you went to — and almost no way to transfer your songs between them. For, while sequencing programs on the ST used the disk drive to save data to disk, you could not take a song recorded on one sequencer and simply load it into a different one, as the format of the stored data differed. The situation became even more awkward once other computer platforms started to become involved.

STANDARD MIDI FILES

In 1987, a number of software companies decided that it was essential to have a common file format for the saving of songs on a sequencer. This led to the Standard MIDI File Specification which is now used by almost every sequencer writer, irrespective of the computer or sequencing program, so leading to a high degree of compatibility in the transfer of songs.

There are three types of MIDI File:

• Format 0 saves the entire song as a single track.
• Format 1 keeps sequencer tracks separate within a song.
• Format 2 saves a song as a series of patterns — though this is very rarely supported.

Until the appearance of General MIDI (GM), the most commonly used type was Format 1. In essence, this has almost no limitation to the number of tracks that can be saved — unless around 64,000 can be termed a limitation. Most computer-based sequencers give you the option of saving a song in either their own proprietary format or as a MIDI File. If you use the latter, you'll be 'exporting' the song on saving, and 'importing' it on loading.

When you load a Format 1 MIDI File, there are likely to be a few irregularities. The MIDI channel numbers that were previously associated with each sequencer track will have disappeared, and it's also quite possible that the track names will have vanished, especially if you are using an older sequencing package. This is because there are two ways of saving track names in a MIDI File, and, depending on the methods used by the sequencer for recording, and the sequencer you are now loading into, the names may or may not still be there. However, the tracks will still be in the same order.

Why do the MIDI channel assignments disappear? If you've recorded sequencer tracks from a keyboard, the MIDI channel for each track will be dictated by the MIDI output channel of the keyboard. For playback purposes, you then re-channel the MIDI data so that the MIDI channel of each track matches up with the MIDI input channels of your sound modules. Such information, which is used solely for playback purposes, is not usually saved in a MIDI File. If the sequencer also allows you to use playback track delays, transposing and the like, the chances are that such information will also not be saved with the MIDI File. Why are most GM-based MIDI Files saved as single-track Format 0 files? Because this allows General MIDI playback devices to read a single stream of data rather than a number of parallel tracks.

If you work live, you may well decide to get a MIDI File player instead of using a computer sequencer. This has a number of advantages, not least of which is the hardiness of a small black box as opposed to the fragility of a computer and monitor. While a MIDI File player simply plays back MIDI Files from a disk, without allowing you to carry out any editing, it has the very real advantage of playing straight from the disk, so eliminating any unwanted pauses between songs.

If you intend to use one of these, check that the MIDI File format it uses coincides with those on offer from your sequencer. If the format offered is Format 0, you'll have to save your MIDI Files in this format on the sequencer. Many older sequencers do not give you any choice: if the song is made up of a single track, it will be saved as Format 0; otherwise Format 1 will be used. ▶

TRANSFERRING SONG DATA BETWEEN MIDI SEQUENCERS

▶ To force such a sequencer to save in Format 0 you may have to hard convert any playback parameters, merge all the tracks down to a single track and then save as a MIDI File.

DIFFERENT PLATFORMS

Many sequencer software manufacturers now support multiple platforms with the same package,

THE RIGHT CONNECTIONS

The setup is as follows, referring to Figure 1 which shows the example of an Atari ST transferring song data to another personal computer (I've used the Atari in this diagram and explanation, but it could be any personal computer running MIDI sequencing software or MIDI hardware sequencer):

Figure 1: Transferring song data between a sequencing package on an Atari ST and a PC or Mac. The need to do this will arise if the originating sequencer does not support MIDI Files.

and most have been sensible enough to ensure that the song data format remains the same irrespective of computer. This allows you to use a common floppy disk format — usually PC — to save a file on one machine and load it directly into another. PC-formatted floppies will be recognised by Atari STs, Macs, Amigas (with a bit of help) and, of course, PCs.

However, there are many situations where neither floppy disk-based transfer or MIDI Files are of any use. You may have purchased a new sequencing package and need to transfer songs from your old sequencer, which does not support MIDI Files. Perhaps you're using a budget non-disk drive-based sequencer for live work, while creating your files on a computer system. Or maybe you want to back up precious song data on a non-disk drive-based sequencer. You might even be using an old computer-based sequencer that has a poor MIDI File implementation — Steinberg's *Pro 24*, for instance, has been known to show a different number of tracks on loading in a saved MIDI File than the number originally saved!

Now there's the rub. Can you simply connect the MIDI Out from the transferring machine to the MIDI In of the saving one, then hit 'Record' on the second and 'Play' on the first? You can, but you're guaranteed to lose most of your song's nuances. As MIDI is a serial protocol, MIDI information is sent sequentially, so busier parts of the song will tend to lose their accuracy of timing through the weight of incoming data. One way around this is to send your song across track by track. Consequently, there are two criteria for a successful song transfer: keep the sequencers in time with one another, and send the data across in a 'thinned out' stream. This can be easier to achieve if you reduce the tempo of the song.

- Connect the MIDI Out from the ST to the MIDI In of the computer. All MIDI song information will pass along this cable.
- Connect the MIDI Out from the computer to the MIDI In of the ST. MIDI timing information will travel down this cable to keep the two devices in sync with one another.
- Set the ST to receive MIDI sync, commonly referred to as 'External Sync' mode.
- Turn soft Thru off on the computer — otherwise the song data received at the MIDI In will be merged with its MIDI sync messages and re-transmitted from the MIDI Out. This will affect the regularity of the MIDI Clock messages and hence the timing of the transfer.
- Set the computer to record. It will send out the necessary MIDI Start and Clock messages to keep the ST in time.

OTHER POSSIBILITIES

Protecting the absolute integrity of your song's timing is difficult, but you can try the following:
- If all tracks on the ST have been quantised, reduce the tempo of the computer to 60bpm or slower, turn all of the ST's tracks on, record on the computer and re-quantise. If, on playback, you find that the song has not quantised correctly, re-transfer it, but either a few tracks at a time or at a slower tempo.
- Any unquantised tracks should be transferred on their own and at 60bpm or slower.

Finally, most modern sequencing packages can unmix tracks according to their MIDI channel. If you are using a program that does not support this feature, and intend to carry out some further editing on the computer, transfer the song one channel at a time, recording each channel on a separate track of the computer sequencer. **SOS**

> "There are two criteria for a successful song transfer: keep the sequencers in time with one another, and send the data across in a 'thinned out' stream."

DiaL M for Mixer

TASCAM M1600 SERIES MIXING CONSOLE

Another 8-buss console hits the streets, as Tascam release an ideal partner for their digital 8-track recorders. DOMINIC HAWKEN takes a listen.

Over the last few years, sales of 8-buss consoles have increased dramatically. A vast array of new models and a few new manufacturers have appeared to cater for the demand, and anyone currently in the market for a new desk is likely to be faced with a bewildering array of mixers, each one with its own unique set of advantages and drawbacks. Part of the reason for this increase in 8-buss popularity lies with the development of affordable digital recording systems, with Tascam's own DA88/38 units maintaining their strong position as industry favourites, along with the ADAT system from Alesis. Many studios have opted to use these 8-tracks in combination with one of the new breed of consoles from manufacturers such as Allen & Heath, Mackie and Soundcraft. Mackie, in particular, have succeeded in capturing a large slice of the market, despite their relatively recent appearance.

In an attempt to redress the balance, Tascam have recently released the M1600 series of consoles. Available in 16 or 24-track configurations, this desk is perfectly capable of coping with a wide range of musical applications, though most systems will probably end up partnering a digital 8-track and sequencer-based setup.

▶

Imagine...

...the power of four completely independent signal processors...

- 4 independent ins/outs
- The equivalent of 4 Signal Processors
- Large Custom Display
- New, easy-to-use Interface
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- S-DISC® powered
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STUDIO Quad V2

:::DigiTech

TaSCaM M1600

DESIGN

The console is a comprehensive 8-buss system, complete with six auxiliary sends and 3-band equalisation. An external meter bridge is available as an option, and the desk makes use of Tascam's own 'Distributed in-line Monitor System' — effectively including the tape monitors in line with each main channel to double the number of inputs on mixdown. Auxiliary returns are also via separate dedicated sockets, further increasing the available channels. Phantom power is fitted as standard.

Colour-wise, battleship grey is the order of the day, with the M1600 bearing quite a resemblance to the Mackie and Soundcraft Ghost consoles that make up its major competition. All connections are via the rear of the unit, and the top panel is a 'one-piece' design, making it impossible to remove individual channels for replacement and servicing. That said, the build quality is high, with a solid and positive response from the faders and controls. The entire desk weighs in at a hefty 26kg — certainly not for the faint-hearted to carry up the stairs — and a dedicated 8-channel microphone preamplifier is also available as an option, to aid in level-matching.

There's currently no provision for adding extra blocks of channels in the form of a Tascam expander unit, although separate stereo sub-mixer inputs are provided on the rear of the unit so an extra mixer could be added to the system. An automated digital desk (like the Yamaha ProMix, or Korg's new Soundlink system) would make an ideal companion to this console, leaving all 24 inputs to handle sequenced keyboards and other external sound sources.

CHANNEL FUNCTIONALITY

The features on both the 16- and 24-channel versions of the M1600 are identical. The left-hand side of the desk is dedicated to the master channel inputs, with a comprehensive set of functions associated with each channel. From the top, we have:

• **Tape switch:** This flips the channel input of the console between signals from tape (connected via the tape returns), and the channel path (which can be fed from either the microphone or the line inputs). During mixdown, this switch allows the monitor section to be used as an extra input, effectively doubling the number of channels available to the user.

• **Trim control:** A rotary fader which adjusts the overall input level to the channel. The built-in preamp is capable of coping with a wide range of levels, from microphone sources to loud synthesizer inputs.

• **D-Out switch:** This switch offers a useful function which is missing from many other similar units. On any 8-buss console, the signal from each channel can be sent to any of the eight available sub-group faders, which are then

connected in turn to the eight inputs of a recorder. In this way, any combination of input signals can be mixed and recorded across any of the eight recording channels. This is an ideal situation when using a single 8-track recorder, but becomes a limitation when more than eight tracks are available. The normal way of wiring an 8-buss desk to a more comprehensive multitrack system would be to combine the recording inputs, so that the first sub-group is connected directly to recording channels 1, 9, 17 and so on. The second sub-group would then connect to recording channels 2, 10 and 18, and so on. This allows recording on any individual tape track, but still limits the number of simultaneous recordings to eight — a major limitation for live performances, where it is often necessary to record each individual instrument on a separate track.

The D-Out switch makes true multitrack recording possible by routing the output of the channel to its own unique socket on the rear of the console, which can then be connected directly to the tape machine. In this way, each of the 24 input signals sent to the mixing desk can then be recorded

> "The M1600 is a solid and workmanlike product, well suited to any studio working within a budget, and especially suited to interfacing with ADATs and DA88/38s."

simultaneously on its own individual recording track. With careful use of the D-Out function, it is also possible to combine the two processes, and route some channels individually, and some via the eight buss faders. This makes the M1600 an ideal choice for anyone who needs to record more than eight individual tracks at the same time.

• **Signal Meter:** Comprehensive tape and input level monitoring is available as an option in the form of the MU1624 and MU1616 meter bridges. It is disappointing that most manufacturers tend to charge extra for this facility although, on the plus side, it undoubtedly keeps the costs of the standard consoles down to an affordable level. If you don't go for the meter bridge option, basic metering is provided on the desk by a single LED, which glows green when any input higher than -12dB is received, and red when a peak above 21dB is detected. This is adequate for everyday ▶

TASCAM M1600

▶ use, especially when the tape machine offers its own comprehensive input metering system, but would definitely be a limitation if it was the only form of metering available.

• **Equaliser:** This is a 3-band equaliser with basic cut and boost available on the high and low frequencies, and parametric control over the mid range. The high control is based around a centre frequency of 12kHz (a separate modification is available from Tascam to lower this frequency to 8kHz), and the low control centres on 80Hz (which can also be modified to 120Hz). The mid range sweeps between 10Hz and 10kHz, and can be cut and boosted by 16dB. I particularly liked the inclusion of this wide frequency range, as it worked well in combination with the simpler shelving controls.

• **EQ Monitor Switch:** This control switches the equalisation from the main signal path to the monitor section, useful for setting accurate headphone balances when recording vocals or other instruments.

• **Auxiliary Section:** Six auxiliary sends are available, designed to route the signal from each channel to any external outboard and add effects to the overall mix. The first two are combined as a single, stereo send, configured via a rotary level

> "I was surprised at how quiet and transparent the desk proved to be, with very little crosstalk to the busses and external outboard."

control and a pan pot. This is primarily designed to configure separate monitor mixes for listening on headphones whilst track laying, and to aid this, auxiliary 3 can be switched between applying effects to the monitor signal, and acting as an individual send for normal mixing. For headphone balancing, sends 1 and 2 may be switched to 'pre-fade' (where the absolute signal level is sent, regardless of the position of the master channel fader). All of the other auxiliaries are hard-wired to operate 'post-fade', as would normally be the case when mixing.

• **Fader Section:** The final section of the channel incorporates a standard fader, together with solo, mute and pan controls, and buss assign buttons that route the signal through to the stereo master signal or to any of the individual group sends.

The rest of the desk is devoted to the eight group faders, effect returns and master volume controls for monitoring the mix. Four individual effect inputs are fitted, each with a rotary level control and solo facility. Each effect return can be routed to the stereo mix, or to the individual group sends so that the signals may be recorded to tape — full marks to Tascam for including this facility, as much of the competition only routes effect returns to the main monitor mix, and setting up complex effects for recording usually means returning their signals via specific channels, reducing the number available for keyboards and tape tracks. Overall studio, monitor and solo level controls are also provided, and the eight group sends can also be assigned to the stereo buss to enable sub-groups to be set up and controlled via stereo pairs of group faders. It is possible, for instance, to route all of the drum channels to a stereo group, and adjust the overall level of the kit from two group faders, rather than altering each individual channel to achieve the desired result.

REAR PANEL

All connections to the outside world are neatly tucked away on the rear of the desk — great if you have a comprehensive patchbay as part of the studio wiring, or if the desk is hard-wired directly to all of the external equipment. Luckily, the panel is angled slightly upwards, so it should be possible to change patches without spending ages behind the desk searching out the relevant input, although this is not recommended.

The first eight channels of the console offer both line-in connections via standard jack sockets (which auto-sense balanced or unbalanced signals), and XLR microphone inputs. Phantom power is available when using condenser microphones, and is applied directly to all of the eight inputs, so care should be taken when mixing powered and non-powered sound sources. All other connections are via jack sockets, or D-type loom connections, which allow banks of eight channels and tape returns to be connected with a single multicore lead. The inclusion of these sockets will make life much easier when using the desk live, as the whole system can be up and running using only six main connection looms and a power cord.

SUMMING UP

I tested the desk at The White House studio in Chiswick, which, as luck would have it, already utilised jack-based looms for connection to the console, so setting up the system was a relatively simple matter. The desk is laid out along very similar lines to the Mackie 8-Bus, although the EQ section lacks some of the Mackie functionality, and the main effects sends are configured differently. I was surprised at how quiet and transparent the desk proved to be, with very little crosstalk to the busses and external outboard. Personally, I would have preferred all six effect sends to be configured directly for outboard, rather than having the first two geared towards

monitor mixing, and the lack of a split equalisation section (where separate EQ may be applied both to the main channel and to the monitor section) meant that headphone balances lacked clarity, but this is a relatively minor gripe. When recording vocals, I tend to send the main mix to the headphones anyway, so that the engineer can hear exactly what the singer is listening to whilst track laying, and in this respect the desk proved an excellent tool. Level matching to the DA88 for recording was spot on, as would be expected with two products from the same manufacturer, and the colour scheme and spacious layout of the controls made adjusting the parameters a simple process. All of the faders and rotary controls performed positively and accurately — Tascam have used quality components throughout.

The equalisation itself is fairly comprehensive, certainly ahead of many desks within the same price range, although I found it was best used as a 'sweetener', rather than a tool to solve any frequency problems associated with nasty-sounding source material. The mid-range parametric covers a wide and comprehensive frequency range, but having only one parametric section limits the overall scope of the machine.

That aside, however, the M1600 system is a solid and workmanlike product, well suited to any studio working within a budget, and especially suited to interfacing with ADATs and DA88/38s. The sound quality is good, and the extra features included for multiple track-laying make it a good choice for engineers looking to record live bands as well as sequencer-based audio. An extra £1000 opens up a number of other options, most with added functionality and expansion capabilities, but the difference in price would pay for a decent complement of outboard effects, improving the depth and sound of any mix. Overall, I was impressed with the M1600, though, and would recommend it as an option for any studio or pre-production house currently looking to improve their mix quality. **SOS**

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Emagic *Logic's* Environment

In the first part of this occasional series for users of popular software packages, we take a look at what you need to do to get up and running using Logic's Environment page, and provide an introduction to the Multi-instrument Object.

The Environment is certainly one of the most powerful windows within *Logic*, yet it is the one that newcomers to the program find most difficult to relate to. It allows you to create, in software, a virtual studio — but why would you want to do that? Leaving aside for the moment the more advanced features, the main purpose of the Environment is to tell *Logic* what instruments you have in your system, and to which MIDI ports they are connected. Furthermore, in the case of multitimbral instruments, known in the Environment as Multi-instruments, you have the opportunity to enter your own patch names. You can type these in manually or import a text file from a word processor, though many commonly available instrument definitions, complete with patch names, are supplied in the Environment Support software that comes on disk in addition to the main program.

One big advantage of the Environment concept is that once you've set up your instruments, and whatever other tweaks take your fancy, you can store them as your default song, so that every time you start a new piece of work, your Environment is set up and you're ready to go. Now, instead of the old-fashioned method of calling up a patch — entering the MIDI port, the MIDI channel and the MIDI program change number — your Arrange page can provide the facility to select any patch on any instrument by name, rather than your having to refer back to the synth manual with the patch listing in it.

The Environment is presented as an empty white area of screen into which the various virtual representations of your MIDI instruments are placed. Objects are simply chosen from the New menu in the Environment page and, where necessary,

OBJECTS: WHAT'S IN A NAME?

Regardless of which window you're working in, any icon or event that you create or that's already there is referred to as an 'Object'. In the Arrange Window, sequences are referred to as Objects; in the Score Window, notes are referred to as Objects, and in the Environment window, instruments and other on-screen bits and pieces are known as Objects. It's useful to keep this terminology in mind, as you'll come across many references to Objects in the various menus throughout the program, and precisely what constitutes an Object depends on what window you're working in.

side of the screen; if this doesn't appear, it's because somebody has switched off Parameters in the View Menu, so go to View and turn it back on again. For the more adventurous user, there are also facilities for creating virtual mixers, MIDI controllers and editors, or to call up MIDI arpeggiators or delay lines (that's where

ENVIRONMENT LAYERS

The Environment can either be a very simple place or an incredibly busy one, depending on what you want to set up in there. At its simplest, it might contain just two or three Multi-instruments and a Metronome icon, but on the other hand, you might have *Logic Audio* with its audio input channel, you may have created MIDI faders to edit MIDI synth parameters directly — you may even have a mixer map set up for a complete digital mixer, or a large-scale virtual control panel for synth editing. All this is possible in the Environment, not to mention the MIDI delays and arpeggiators that come as standard with the software. Obviously, if you try to view all this at once on a small screen (and you can if you want to), things are going to get messy. For that reason, the Environment may be viewed as a series of layers, with Audio Objects on one layer, MIDI instruments on another layer, Mixer Maps on another, and so on. The currently selected layer is shown in a small window beneath the toolbox, and the usual clicking and holding routine brings up a list of options to scroll through.

CLICK TRACK

When you record or play a track with the metronome click enabled, you'll hear the usual one-beep-to-the-beat noise from your computer, just as you did with older Atari sequencers, but sometimes that's not loud enough. It's often better to have your drum machine playing the click on a side-stick or similar sound, and in *Logic* you can also choose a different MIDI note or velocity, or both, to play each bar, beat and sub-beat if you want to. Even if you choose the same sound, four beats to the bar, it helps if the first beat of the bar is played at a higher velocity so you can hear where the bar starts.

To set up an instrument to play your click, proceed as follows:

- In the Environment page, go to the New menu and select Metronome. A triangular Metronome object should appear in your Environment window.
- Drag the 'plug' part of the Metronome icon and plug it into the Instrument icon representing your drum machine.
- Select the Metronome Icon so that its parameter box appears on the left of the screen, then enter the MIDI channel, MIDI notes and velocities required for the bar, beat and sub-beat (Division) sounds. It is possible to have each bar, beat and sub-beat sent to a different MIDI channel if required, but I feel that's a bit excessive for most people!
- The Metronome is now configured.

wires are created by dragging the connector symbol sticking out of each Object icon and jamming it into the destination object. However, if you just want to set up a basic system, instruments don't have to be connected to anything — you just need to fill in the parameter details: what they're called, what port they're connected to, what channels they work on, and so forth. No other Environment Objects are absolutely necessary, though you may want to set up an instrument to play your metronome track. If so, refer to the 'Click Track' box.

Unwanted Objects can be selected and then deleted using the backspace key. Whenever an Object is selected, a parameter box relating to it appears at the left-hand

the virtual wiring starts to become important) but these can wait until another day.

When you first boot up *Logic*, a default Environment is provided, which allows you to assign each sequencer track to a different single MIDI instrument on the same port, in much the same way as you'd expect to be able to do on any entry-level sequencer. This is fine if you have just a single GM instrument connected, but if you have a multi-port interface or a lot of different synths, you really need to create an Environment specific to your own setup in order to be able to work efficiently. The rest of this article focuses on various aspect of setting up a basic Environment.

TOURING THE ARRANGE WINDOW

When you first launch *Logic*, you're greeted by the Arrange Window, which includes transport controls in the top left-hand corner. A separate

Track List shows all the Environment 'Instruments' being used in the current song (another feature of the Environment page is that you can choose from a long list of icons to assign to your different instruments or sounds). When the software is first loaded, on version 2.5 and earlier, these instruments are all single (one MIDI channel each), and the default icon is a MIDI connector. To select a

new instrument for any track, simply click and hold the mouse on the icon currently showing for that track, and a whole list of available instruments will appear. Using the mouse to scroll up or down the list, you can select any of the displayed instruments — so unless you've deliberately hidden some of these, you'll be able to peruse every instrument that exists in the Environment window.

Selecting a patch from within an instrument can be done in two main ways. One is to click and hold the mouse on the currently selected patch number in the Parameter box (after selecting the desired track), and a list will appear, this time showing all the patch names as entered in your Environment representation of that instrument. Scroll up or down, and select whichever patch you like. The other way to select a patch is to click in the

top right-hand corner of the Parameter box, whereupon a window will appear showing all the available patch numbers in the currently selected bank of the instrument. Select any patch name with the mouse and the corresponding patch will automatically load. This is a good way to try out different sounds.

Bank selection, where appropriate, may be instigated either from the Bank line at the top

transport window can be opened if required. Along the top of the screen are the three main menus: File, Edit, and Windows. Along the top of the Arrange window is a set of window-specific menus — Structure, Edit, Functions, View and Options. This system is carried through to other windows, where each has its own dedicated set of menus.

Running down the far left of the Arrange Window are three Parameter boxes; in descending order, these are the Object Parameter box (which governs changes to individual sequence or audio objects), the Toolbox (containing the editing tools), and the Track Parameter box (which handles the settings for the selected track and any sequences recorded in it).

To the right of the Parameter boxes you'll find the Track List. If it's too wide or too narrow, you can resize it by clicking in the top right-hand corner (where it meets the time ruler) and dragging it to the desired width. The

of the patch window, or by holding and scrolling with the mouse over the division symbol that comes directly before the patch number in the Parameters box.

EXPLORING THE ENVIRONMENT

The purpose of this section is to enable you to locate Objects in the Environment, change their parameters, and select alternative icons to represent them. When you first boot up *Logic*, or if you haven't created your own default Autoload Song, you'll find that a very basic Environment has been set up for you. Open the Environment Window, either from the Windows menu at the top of the screen or by double-clicking on one of the MIDI tracks in the track list, and you should see a mostly white screen with some small keyboard icons laid out horizontally, representing the individual instruments. These are the same ones that you can see in the track list in the Arrange Window.

Select one of these icons by clicking on it with the mouse. Down the left-hand side of the Environment Window you'll see a Parameter box, a Layer box and the Toolbox. Layer tells you which layer of the Environment you're currently working in — see the 'Environment Layers' box for an

explanation. This should be showing 'MIDI Instr', but if some other layer is selected, click on this box, hold the mouse button down, and you'll find that a list appears, from which you can select the desired Layer.

At the top of the Object Parameter box, you should see the name of the selected Object (selected Objects tend to show in black, or at least partially black), underneath which you'll have a description of the type of Object — in this case 'Instrument'. Underneath that there will be the word 'Icon', to the right of which you'll see two things: a box with a cross in it (a 'check' box that's been checked), and an icon exactly the same as that on the Object you have selected. If you click on this icon, and hold the button down, you'll be presented with a long list of alternative icons: parrots, elephants, guns, mountains, log drums — don't blame me, I didn't choose them! The check box determines whether or not this object and its icon will be displayed in the Track List, and unless you have a

huge MIDI system, you'll probably want to check everything so it all appears on the Arrange page when you come to choose an Instrument.

The next line tells you the channel that's selected (on a Macintosh, the choice of output port is also displayed here: M0 is the modem port, P0 the printer, and so on). If you have an 8-port interface plugged into the modem port, as I have, the instruments are set to ports 1 through 8, depending on where they're plugged into the interface. Interfaces with up to 32 ports are supported.

The next line down (PC Windows version only) tells you which output driver you're using; for example, LOG2PC is the Emagic Log 2 PC, SB16MIDI out is the Soundblaster MIDI port, and so on. The next three lines, Prg (Program), Vol (Volume, Controller 7), and Pan (Controller 10), are used to change Program, Volume and Pan for the selected objects. The next two, Transpose and Velocity, can be used to increment or decrement transposition and velocity if you click and hold the

button down just to the right of the words and move the mouse up and down.

Towards the bottom you can see parameters for Lim (Note range limitation — lower and higher), VLim (Velocity limitation), and Delay (positive or negative delays can be applied to objects either in note values or milliseconds, depending on your preference). Most people would tend to leave these at their default settings to start with. If you check the No Seq Trp (No Sequence Transpose) box, this function is applied — handy for drums, because when you transpose, you don't want the drum sounds to be affected. The No Reset function disables the transmission of reset messages to that object. The word AUTO refers to the current score style selection for the selected instrument. This box as a whole will completely change depending on the Environment Object that you select, but I hope I've gone into enough depth for you to fathom out what the other Parameter functions do. For a step-by-step guide to setting up a Multi-instrument, see the 'Setting Up a Multi-instrument' box.

▶

Emagic *Logic's* Environment

SETTING UP A MULTI-INSTRUMENT

One of the more useful Environment Objects is the so-called Multi-instrument, an icon able to represent a single MIDI instrument with from 1 to 16 parts operating on up to 16 separate MIDI channels. As the majority of modern synths are multitimbral, this is a useful Object to get acquainted with. Even if you have some monotimbral instruments, you may still want to represent them using a Multi-instrument (with only one channel active), because *Logic* doesn't allow you to name patches in single instruments. For example, I have a Matrix 1000 on channel 13, so my Matrix Multi-Instrument only has channel 13 turned on. What's more, the support files included a ready-made instrument including a list of all 1000 Matrix 1000 patches, which saved me hours of typing.
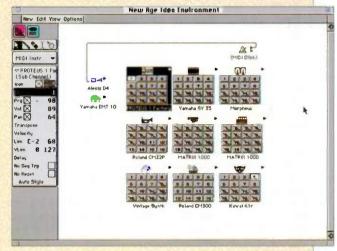
• Step 1: Click on the 'New' menu at the top left of the Environment screen and choose the second option, 'Multi-instrument'. You should now be able to see a kind of square box with the numbers 1 to 16 written in it — it looks rather like a 4x4 block of grey chocolate. This is a Multi-instrument, as shown in the Environment screen shot.

• Step 2: Using the Text tool, you can click on the name beneath the Multi-instrument to change it. Type in the name of your chosen synth. Alternatively, you can rename the instrument directly via the Parameter box to the left of the screen by clicking on the current name. A dialogue box will open up for you to type into.

• Step 3: On the Multi-instrument itself, you'll notice that all 16 number buttons have diagonal lines crossing them out, indicating that the parts are not active. Clicking on each number button in turn will remove this line and thus activate the channel that the number represents.

• Step 4: You will see an Icon at the top of the Multi-instrument (and in the Parameter box) which looks like a MIDI Socket. If you want to, you can change the icon from the Parameter box as previously explained. Specific icons exist for many common synths, so check these out

before going for a cat's head or a Luger pistol! You can also select a different icon for each of the 16 parts of your Multi-instrument if you want to, by clicking in the appropriate numbered square, then selecting the required icon in the Parameter box to the left of the screen.

• Step 5: Double-click on the icon at the top of the Multi-instrument and a window will now appear, with a list of the General MIDI sounds already in it. This is bank 0 of the Multi-instrument. There are four boxes at the top of the window: 'Device name', 'Short device name', '(No bank specified: names of bank 0 used)', and 'Bank Message: Control 32' (see screen).

• Step 6: Click and hold on the box named 'No bank specified...' and you'll see a list of the 15 banks available to you. Select bank 1 by sliding down to it and releasing the mouse button. A dialogue box should appear asking you whether you want to 'Initialise new bank?' Click 'OK'. A new bank will now appear with program numbers from 0 to 127 displayed in it. You can now enter the names of the sounds in the various banks by double-clicking on the bank number and typing in the name. It is also possible to paste in names from a word processor document or to copy and paste an instrument from another Environment. See the manual for more details of these alternatives. Also check out the support disks, as these contain many ready-made Environment Objects for popular synths that you can copy and paste into your own Environment.

• Step 7 (after much typing): You should now select the bank change message that your synth responds to. If it is Control 32, you need not bother, as this is the default setting. Otherwise, just click on the box 'Bank Message: Control 32' while holding the mouse button down, slide to the desired message and release the button. You will notice that there's a number of ready-configured bank messages specific to certain popular synths. If you successfully selected the bank message for your synth, go straight onto step

9. If your synth requires different bank change messages for different banks, go to step 8.

• Step 8: From the bank message list, choose the 'Use custom bank messages' option. From the 'Options' menu at the top of the Environment Window, choose the fifth option, 'Define custom bank messages'. You should now be presented with a list of the banks (see screen). To the right of the list will be the controller

number (default 0), and the value that is to be transmitted; you can change both number and value by clicking and holding on the current digit and moving the mouse up and down as required.

• Step 9: As you now have a fully configured Multi-instrument, the chances are that you won't want the original single instruments to appear in your track list any more. You can prevent this by doing one of two things: selecting each one in turn and removing the check from the check box in the 'Icon' parameter, or simply deleting them all with the Eraser tool in the Toolbox. But do not delete or disable the 'C Original' Icon — you may well still want to use this, as it provides multiple-channel output on a single track. If you now close the Environment Window and return to the Arrange Window, most of the Tracks in the List will now read 'No Output' as you've just deleted the single instruments that relate to them.

• Step 10: Click and hold on each 'No Output' Track and slide up or down the list until you find the name of your synth, followed by

the desired channel. You should now see a list with the name of your synth written 16 times, followed by the channel numbers 1-16 from top to bottom.

• Step 11: Put a check in the 'Prg' check box. With the track that corresponds to MIDI channel 1 selected, click and hold on the division symbol to the right of the 'Prg' check box and slide up to the '1' position (the Bank number). Now click and hold on

the number '0', to the right of that (the Patch Number), and you should get a list of the sounds on bank 1 of your synth. Select the desired sound by scrolling up or down the list. The necessary bank and program change messages are transmitted to your synth. An alternative way of selecting patches is to click on the patch name at the top of the parameter box; a new window will open showing all the sounds in the current bank. Simply click on a sound and the program change will be sent to your synth. This page is a good way to browse the sounds of your synth, as it stays open until you deliberately click the Close Window box.

You have now created a Multi-instrument for your synth. If you want to create more for other MIDI gear, just repeat the above steps, leaving out step 9. For instruments with fewer than 16 parts, simply activate only the channels you want to use. Once you've arranged the Environment as you want it, save the empty song as your Autoload song so that it comes up every time you start work. And save a copy on disk too, in case you accidentally change or overwrite it!

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A GUIDE TO UPGRADING YOUR PC

These days, many businesses plan to replace their computers every two years. Although bi-annual upgrades don't come easy on your wallet, in the fast-changing world of the PC-based musician, upgrades are eventually inevitable. MARTIN WALKER advises you on how to negotiate the troubled path to DSP processing paradise...

You may have noticed in my previous *SOS* features just what problems there can be for anyone struggling on with a 486 PC when today's software packages are all feature-laden and processor-hungry. My first all-out failure occurred when attempting to download sample data from my Akai sampler to *Sound Forge* on the PC using MIDI sample dump (see the feature that resulted from this problem in *SOS* October '96).

processor will face this sort of problem if they try to use software written in the last year or so.

The time had come for me to take the bull by the horns and upgrade. As I have mentioned before, my preferred route is to use a local supplier who will upgrade the machine, give me a trade-in price on the parts no longer required, and provide a guarantee on all new parts and work carried out. I use Solutions of Cheltenham, who have provided an excellent service on each occasion that a major upgrade has been required. Using a local source may not be the cheapest route, but having attempted the alternative of buying blindly through mail order, and ended up with a graphics card that stopped one of my previous machines even booting up, I can personally recommend the peace of mind that comes from knowing that your upgraded machine has already been tested. Furthermore, this way, if anything does go wrong in the future, you are geographically close enough to return it in person and get everything sorted out with the minimum of downtime.

The anatomy of the typical PC has already been covered in these pages by Janet Harniman-Cook in *SOS* November '96, but even if you know the basics, there are still a lot of choices facing anyone attempting to upgrade. In the two years since I last took the plunge, a whole host of new features have been added to the latest PCs, such as pipeline burst cache and EDO RAM (of which more below). Starting with the choice of motherboard (and there are quite a few of these around using

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WaveLab Help

File   Edit   Bookmark   Options   Help

Contents | Index | Back | Print

Below follows an outline of some systems and their expected capabilities:

Non-real time capable system
With the system below, WaveLab runs fine, but you will not be able to take advantage of the real-time processing in the Master section:

- 486 DX.
- 8 MB of RAM.
- 256 color video card, 14 inch monitor.

Minimum real time capable system
- Pentium 90 or 133.
- 16 or 32 MB of RAM.
- 256 color video card, 15 or 17 inch monitor.

Profesionnal WorkStation
The system outlined below will provide extremely fast DSP processing and editing. Please note that the Pentium Pro in this case delivers twice the power of a regular 200MHz Pentium.

- Pentium Pro 200.
- 32 or 64 MB of RAM.
- 256 color video card, 17 or 21 inch monitor.
- SCSI Hard-disk.

Steinberg's WaveLab v1.5 shows the way that audio software is going in terms of hardware requirements. The more you have, the more you want...

With the Akai sending sample data at its standard rate, my 486DX33 simply couldn't intercept and store the data as fast as it came in through the PC MIDI port, and *Sound Forge* ground to a halt for the entire duration of the sample dump. Sooner or later, everybody still using a machine with a 486

'Grade

different chipsets, and having different overall performances), your decision will be affected by the number of expansion slots available in your PC, and whether they are of the newer PCI type or the older ISA version. More and more PCI cards are appearing in the marketplace, and there is the promise of higher-performance PCI soundcards in the near future — so you can end up caught between choosing a motherboard which has more potential for future use, or buying one because it has more ISA slots to cater for your existing expansion cards. Anyone upgrading from a machine with the older VL-buss standard (like me!) will have the added frustration that whilst spare VL-buss slots could be utilised by ISA cards, the newer PCI standard does not permit this, so you may be faced with the possibility of having to discard an ISA device because there are not enough ISA slots to go round on a Pentium motherboard.

Far from being a simple procedure, a planned upgrade provides the ideal opportunity for you to think long and hard about your future plans for the PC, rationalise some of your more ancient ISA cards, and try and end up with an upgraded system that properly balances current requirements with further expansion potential. With cost-effectiveness firmly in

mind, here is the *SOS* guide to upgrading PCs without (too many) tears.

PROCESSING THE PROBLEM

The first and most fundamental choice is which processor to go for. A Pentium is pretty much obligatory, as anything slower will not run today's software effectively. However, there are a multitude of Pentium processors, not only from Intel, but also clones from AMD and Cyrix/IBM, which have the same functionality, but different performances and/or price points. The Pentium itself also comes in several varieties. Top of the range is the Pentium Pro, which was designed from the ground up for use with a 32-bit operating system, and so will not give optimum performance with Windows 95 (though you may have heard Windows 95 described as a 32-bit operating system, this is not always the case — see the 'NT Promises' box for more details). The Pentium Pro also uses a more expensive motherboard, which can be up to double the price of an equivalent straight Pentium board. Although in raw power terms, the Pro chip outperforms a Pentium of equivalent clock speed, there are other ways to achieve this improvement.

The Cyrix range of processors uses many of the tricks that give the Pro its extra power, but using a standard Pentium-style motherboard. (Although designed by Cyrix, they are

about you should back up anyway. Better safe than sorry!

Don't bother to try to save every file currently on your hard drive — even a 500Mb drive may well fill a couple of hundred floppies, and this is not necessary. Do take copies of all INI files (normally found in the Windows folder), which commonly note all of your hardware settings and preferences for each application (subsequent set-ups will create new INI files, but it can save a lot of time if you still have the originals, which may contain records of any personalised settings you have made over months of use).

Make sure that you still have the original disks (floppy or CD) for each application, and that any serial numbers needed by the setup/install procedure are still to hand. Particular ones to watch out for are shareware authorisation numbers — often you will receive these in a letter as a response to sending a cheque, or by email as a result of supplying your credit card number. Make sure that you have these numbers written down before you go any further. If you have installed applications from magazine cover-mounted CDs, make sure that you still have them to hand. For every hardware card, write down the settings used by software drivers — they may well be included in

INI files, but it is best to make sure. If you use the Internet, save your bookmark settings, as well as any files that you have downloaded. If you have downloaded zipped programs, make sure that you either have the original ZIP file as downloaded, or failing that, you may have to download the whole thing again. Simply copying all of the relevant files is not enough — the Windows registry is updated by each new install, so if you have deleted the setup program it may be tricky to get everything working properly again.

If you are trading in or selling the machine, remove any expansion cards that are not included in the deal, and fill the resulting holes in the case with the original blanking panels (you did keep them, didn't you?). If you are keeping the same case, this is also an ideal chance to vacuum the inside of the machine with a suitable attachment — air filters and fans in particular can attract large amounts of caked-on dust, and the machine will run cooler if air can flow freely over surfaces that are not coated in a thick layer of gunge. Finally, before you groan inwardly at the thought of re-installing everything on the new machine, think what a marvellous opportunity it will be to organise all of your folders and files to make future work easier and more pleasurable!

Cubase Score v3 used at 800 by 600 resolution is perfectly adequate for general rock tracks — if you don't use more than about 16 tracks in your music, a 14- or 15-inch monitor will display these perfectly adequately.

for multimedia purposes, as well as a larger on-board memory cache. In a straight side-by-side comparison with a standard Pentium, they have only about a 12% speed improvement, but once applications start appearing that are optimised for its new architecture, there are promises of 30-40% average speed improvements, particularly targeted towards graphics and sound. Ensoniq have already announced AudioPCI, a sound architecture that uses MMX to drive wavetable and synthesis chips at a much lower cost than using a dedicated audio processor.

Ultimately, as the old saying goes, you pays your money and takes your choice. Entry level for PC-based audio recording and editing must now be 166MHz; so if you were intending to buy a Pentium 166 or 200MHz, the MMX version (at the same price) is the obvious solution, although they are still in short supply at the time of writing (the end of February) — and don't expect MMX versions of much software for the next few months (we are still waiting for a 32-bit Windows 95 version of *Cubase!*) If, like me, you are driven by budget, then bear in mind that the Cyrix P166+ still outperforms the original Pentium 166MHz, but at a typical system price of about £200 less. Many PC suppliers also claim that a P166+ with 32Mb of RAM will outperform a P166 MMX with 16Mb in most existing applications. Always bear in mind that (apart from the Pro range) all processors are direct plug replacements — you can always buy a faster one later.

▶ manufactured by IBM — so they are often described as Cyrix/IBM). Such are the speed advantages that the Cyrix P166+ processor actually runs at a clock speed of 133MHz rather than 166MHz, on the grounds that its performance matches, and in many cases improves on, that of the standard Pentium 166MHz processor. Its only downside is in floating-point performance, which is not quite up to that offered by the standard Pentium. You won't always notice a difference, but if you anticipate performing functions involving lots of audio number-crunching, you should bear this in mind. Overall, the Cyrix range is about 6% faster than the equivalent Pentium. The other main manufacturer is AMD, who markets the K5 range, but these are intended as low-cost replacements for Pentiums, and so are probably not the best choice in a multimedia system.

The latest development is the MMX (MultiMedia eXtensions) range from Intel, which are direct plug replacements for the two top Pentiums (166 and 200MHz), and which have their innards optimised

MOTHERBOARDS

If you are a DIY upgrader, you will need to choose a motherboard, but even if you are buying a complete replacement system, it is still useful to know the options. All modern boards are PCI and incorporate a Plug & Play BIOS, but there is still plenty of variation. The powerhouse of the motherboard is the chipset — the support circuitry that interfaces between the processor and the rest of the hardware. For Pentium machines, the most popular is Intel's Triton 430HX chipset (also known as Triton II, to differentiate it from the earlier and less powerful Triton 430FX chipset), and you will find this on many modern high-performance boards. Most will support any Pentium between 75 and 200MHz, and the Cyrix range between the P120+ and the ▶

SCRAP OR SALVAGE?

I fully intended to upgrade my old machine at first, on the grounds that I thought it would be considerably cheaper. In fact, if you have a VL-buss machine with 32-pin SIMM memory, as I did, very little can be salvaged. Most modern Pentium motherboards use 72-pin SIMMs. You can buy adapters that allow older 32-pin devices to plug into 72-pin sockets, but with memory at £50 for a pair of 8Mb SIMMs, this is folly. At the very

least then, a 486 setup will need a new motherboard, new processor and memory. A bog-standard PCI graphics card will probably only be another £30. Then, of course, your existing disk drive may well be too small, and probably not one of the newer EIDE types, which will operate much faster. The cost of replacing most of your PC's innards may well be such that it will be cheaper to sell or trade in your entire PC and buy a new one, which

will at least come with a guarantee. If you are strapped for cash, your existing monitor may be retained, but newer PCI graphics cards may have to be run at their lowest refresh rate if the monitor is more than a couple of years old, with a corresponding rise in flicker. Even keyboard and mouse can be bought for about £15 or less each. It's a sad fact of life, but unless you are extremely fond of your old machine, it is probably best to call it a day, and retire it in one piece at a better trade-in price.
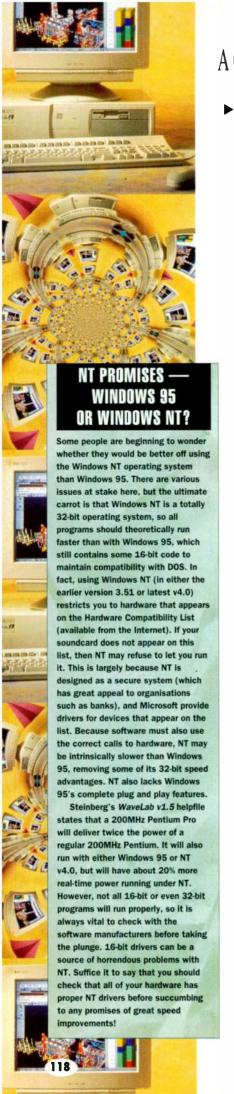
A GUIDE TO UPGRADING YOUR PC

▶ P166+. The P200+ is only catered for by a few designs, but at the moment the Pentium 200 MMX would seem a better alternative, so this is not much of a restriction. The other popular alternative is the Intel 430VX chipset — the 430HX is supposedly aimed at power users and is currently the fastest around, while the 430VX is intended for Pentium processor-based home and small business PCs. The latest chipset for Pentium Pro motherboards is the Natoma (440FX) from Intel, which is cheaper than its predecessor, but still around £100 more than an equivalent Pentium board.

SLOT MACHINES

For the PC musician, another significant feature of the motherboard is the number of PCI and ISA slots available. Always get this confirmed or have the cover removed and see for yourself before parting with your money, as motherboards often change on a monthly basis. I was lucky — my anonymous motherboard came with four of each, allowing me maximum versatility, but features one so-called 'shared slot'. This terminology can be confusing — there are physically four of each type of slot, but you can only ever use a total of seven (either made up of four PCI cards and three ISAs or three PCIs and four ISAs). You should also find out how many slots will be taken up already. Most motherboards now have integrated disk I/O, but at least one PCI slot will probably be occupied by a graphics card. Other slots on the motherboard include those for the main memory used by the system.

The absolute minimum memory for modern machines is 16Mb, of whatever variety. The current most popular flavour is EDO (Extended Data Out) RAM, which gives excellent performance in conjunction with a pipeline burst cache. EDO RAM allows for a timing overlap between successive accesses, giving a speed improvement of about 20% over regular memory. The cache memory is very fast (typically four times the speed of the main memory) and sits between the processor and normal RAM. Any data that is likely to be needed again in a hurry will probably still be stored in the cache, and can be retrieved far more rapidly than from RAM. Many machines come with 256k caches (and some are hard-wired onto the motherboard), but for better performance the full 512k cache normally only costs about £15 extra if it isn't standard, and is well worth going for.

Most machines now use RAM in the form of 72-pin SIMMs (Single In-line Memory Modules). These must be inserted in pairs, so for 16Mb memory, for example, two 8Mb SIMMs are used, leaving two further sockets for future memory upgrades. Most motherboards have four memory sockets, so you only get to upgrade once before you need to trade in your existing memory for larger-capacity SIMMs. However, memory is
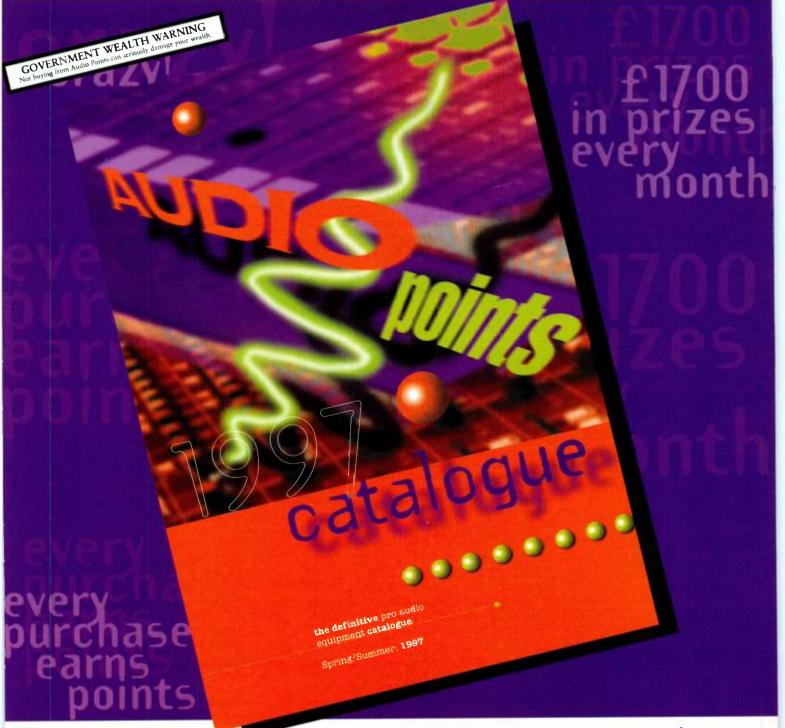
currently about £50 per 16Mb pair, and buying 32Mb at the start may well give you a bigger boost in performance than opting for the next fastest processor. Other memory types include DIMMs (dual versions of SIMMs) which can be used singly, but fewer motherboards support these.

Once you have chosen the motherboard and its components, the choice of case is fairly easy. For musicians, avoid any slimline types, as they often have limited space for full-length expansion cards. Desktop types are fine if you intend to sit your monitor on top, but a mini or midi tower (different only in size and maximum number of drive bays) may be a better bet, as then you have the option of mounting them underneath a desk, where their whirring may well be less intrusive (see my article on essential utilities for the PC musician, which starts on page 124, for further ideas on this theme). Don't underestimate how many drive bays you might need in the future — a mini-tower may have two 3.5-inch ones (one already used by a floppy drive) and two 5.25-inch ones (a CD-ROM will always occupy one of these). Allow for a possible Syquest or Iomega removable drive at least. Thankfully, some suppliers are also starting to feature systems that allow all expansion cards to be full length, as well as designing in lower noise levels — machines featuring the Intel ATX motherboard and case are particularly good in this respect, although both are more expensive than average.

SAVING IT FOR LATER

Disk drives for storing applications and data have come on in leaps and bounds over the last couple ▶

> **"A planned upgrade provides the ideal opportunity for you to think long and hard about your future plans for the PC, rationalise some of your more ancient ISA cards, and try to end up with an upgraded system that properly balances current requirements with further expansion potential."**

WRH

The same application at 1024 by 768 on a 17-inch monitor shows how much more information can be seen. In this case a full orchestral score can be viewed in its entirety, which is ideal for anyone writing more complex arrangements.

"The cost of replacing most of your PC's innards may well be such that it will be cheaper to sell or trade in your entire PC and buy a new one, which will at least come with a guarantee."

▶ of years, with huge improvements in capacity and performance at an ever-lower cost. With current pricing such that a 1Gb (1000Mb) drive is available at about £120, there is absolutely no reason to skimp on size. Many PC outlets are already moving to 2Gb drives for entry-level systems, and this will no doubt be standard in a few months. For the musician, allow at least 500Mb for your normal applications (unless you're an old Scrooge like me!), and if you intend any hard disk recording, another 1Gb is a reasonable size to assemble a 650Mb CD's worth of music in stereo with a bit over for editing. With this in mind, 2Gb looks like a safe bet. Most modern EIDE (Extended Integrated Drive Electronics) drives will be suitable, and most will be able to operate in Mode 4, which allows very fast speeds to be achieved. Quantum Fireball drives are particularly popular with system builders. AV drives can be obtained, and if you can afford the bit extra, they are probably worth it, since normal ones must occasionally stop for a thermal recalibration, which may cause an audio glitch if you're recording at the time. Most people get away with non-AV drives — it just depends whether you are prepared to wait until your first recording to see whether everything is OK. SCSI drives are more expensive, and need a host adaptor to control them, but they do allow you to add further drives external to the PC. For more information on choosing drives, see my previous two-part feature in the January and February '97 issues of *SOS*.

SEEING THE RESULTS

A fast graphics card is also a must, since hard disk recording is always held back by the slowest link in the processing chain. When running MIDI programs, the big crunch comes when the cursor reaches the right-hand edge of the screen, and a full screen update is required; slower cards can cause an audible glitch here. Although cheaper and slower cards will still show a sharp picture, it will probably be at a lower refresh rate. This is the number of times per second that the screen is redrawn. 75Hz is generally regarded as the minimum acceptable rate — any lower than this and most people will discern flicker, which may lead to eyestrain or headaches. One of the most popular graphics cards at the moment seems to be the Matrox Millennium, a PCI card which can be obtained for about £130. The newer Mystique model is cheaper at about £90, and one of these two models always seems to be in the machine that beats the rest in those computer round-ups. 2Mb of video RAM is normally adequate, and will support even 1280 by 1024 with 256 colours, which ought to be more than enough for music applications.

Although 14-inch monitors are adequate, 15-inch ones give a clearer display at 800 by 600 resolution, which is the minimum you really need for music sequencing. All of the impressive screenshots you see for modern sequencer packages will probably be using a 17-inch monitor and 1024 by 768 screen resolution. If you need to see two packages running side by side (like *Soundscape* and *Cubase* for instance), this sort of resolution makes things much easier on the eye. Don't be tempted to go for a 17-inch model on price alone, as picture quality is vital, and a high-quality 15-inch will probably serve you better than a bargain-basement 17-inch with a fuzzy picture. If you are buying a complete system, the difference between 15- and 17-inch monitors may be as little as £175! Try to view models side by side if possible, to judge for yourself. I have used a 14-inch monitor at 1024 by 768, but you end up squinting at the screen, since details are so tiny, and it's not easy to write inspired music with a headache!

DECISION TIME

When I decided that an upgrade was finally essential back in December, the MMX processors mentioned above were still not available. Even as I write, many magazine ads show machines claiming 'MMX technology' in large letters, with 'upgradeable to' in small letters above. In the end, I chose a Cyrix P166+ machine, with 16Mb RAM and 512k cache, a cheap PCI graphics card, and a 1Gb Quantum Fireball disk drive. By retaining my previous monitor, CD-ROM and soundcards, and trading in my previous system box complete, my total bill came to under £500. If I need to in the future, I can upgrade to a 200MHz Pentium MMX just by replacing the processor, and still get a trade-in on the current one. At the moment, a P166+ machine is about £200 cheaper than an P166 MMX version, and for the time being, it's not that much different in performance until the new software arrives. And as is always the case in the ever-changing PC world, there's a gang of even faster components hiding round the corner, waiting for our wallets to recover from the current round of upgrading...

Bytes
and PCs

ESSENTIAL ACCESSORIES FOR THE PC MUSICIAN

PC utility programs are either invaluable workmates, or end up languishing in a corner of your disk drive, rarely used. In a quest to sort out the most useful items for musicians, MARTIN WALKER subjects his PC to the ultimate test.
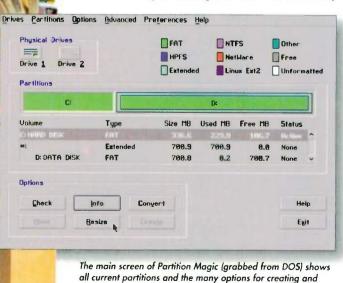
As long-term PC users know (and the Mac- and PC-owning Editor of this magazine never tires of pointing out), there are many areas in which there is room for improvement in day-to-day PC operation. Installing new software and hardware can produce system conflicts which you then have to resolve; sometimes, tweaking PC performance to use the latest hard disk recording software more effectively can seem a permanent occupation. In view of this, it is not surprising that an army of software authors are constantly beavering away to produce the perfect utility program — one that will coax the ultimate performance from a given machine, just in time for the machine to be declared obsolete so that a newer, and equally problematic, machine can start on its own road to nirvana. To help us all on our way, I have gathered together a selection of utility programs that could prove essential purchases for the PC musician.

PARTITION MAGIC v3.0

For any hard disk recording freaks out there, this performs what can certainly be considered as magic. Partitioning an existing disk drive can have many advantages, but more than anything else, with today's huge disk sizes, it can save considerable amounts of space. Since the file allocation table (FAT) for Windows sets a minimum size for each available 'pigeon-hole', based on the size of the drive, anyone with a typical drive of 1-2Gb will find that even a 1-byte file still occupies a single 32k allocation unit, wasting 32767 bytes in the process. By partitioning this drive into several smaller 'logical' drives, and labelling these C:, D: and so on, you can use disk space far more effectively (512-1023Mb has 16k units, and 256-511Mb has 8k). The result? Your identical files take up far less space on the disk, leaving more available for other things, and in many cases, it is possible to reclaim hundreds of megabytes in this way. However, for hard disk recording, using storage more effectively is not the only advantage. By creating a separate partition for sound data alone, it is far easier to keep this area well defragmented for maximum disk read/write speeds (and remember, if any program puts a hidden 'read only' file on your disk, many defragmenters will leave this alone, resulting in an 'island' that every subsequent write has to jump around). Backing up a separate partition of audio is easier too (there's no need to worry about the other data on the disk — simply back up the audio partition). Partitioning also makes it far easier to keep tabs on audio projects — once a project has been finished and backed up, you simply erase all files within the separate partition, and are then ready to start with a clean slate, without worrying about accidentally wiping anything else by mistake.

OK, so that's how it works in *theory*. In practice, many musicians have fought shy of partitioning their drives, because of the vast amount of work involved. First, every file on your disk needs backing up for safety, and then the current partition needs to be deleted using the *FDISK* program (a process which destroys all data). Several new partitions then have to be created using *FDISK*, and these formatted using the *FORMAT* utility. After this, you need to reinstall Windows, then all of the other applications, and then restore your data files from the backup you took earlier. Is it surprising that so few people undertake this process? *Partition Magic* allows you to re-size your current partition, create and re-size additional ones, but — and here's the magic bit — you do this completely 'on the fly' whilst the existing contents of your hard drive stay perfectly intact!

The program is quick and easy to use. First, you re-size your current partition (which normally will be a single one occupying the whole drive) to a suitable size. With my 1Gb drive, I decided to leave enough room for a second partition of 700Mb (to hold a CD image of up to 70 minutes), and that left 336Mb. Once you've re-sized, the only thing that can be ▶

The main screen of Partition Magic (grabbed from DOS) shows all current partitions and the many options for creating and modifying them.

WinProbe 95's main screen — the only thing it got wrong was the speed of my processor, which is actually 133MHz. Mind you, it got the other 99% right, cleaned up my Registry, and saved me from many crashes, so who's complaining?

▶ confusing is that you first need to create an 'extended' partition with the remaining 700Mb of unused space, and then create a FAT partition of 700Mb so that Windows can see the second area as a so-called 'logical' drive, which will appear with a new drive letter. If you currently have one partition labelled C:, you will end up with two, labelled C: and D: (the first of which still holds your previous data, the second of which is a completely new logical drive). The whole process took about 10 minutes, and I immediately gained 18% more hard disk space, as well as a far more effective use of my hard drive for hard disk audio. You can re-size any partition or create more at any time without disturbing the data (but of course it will not let you shrink any partition below the size of its current contents). All in all, I suspect that many musicians will be trying this one out — *Partition Magic* turns what used to be a tedious and involved procedure into one that is elegant and satisfying!
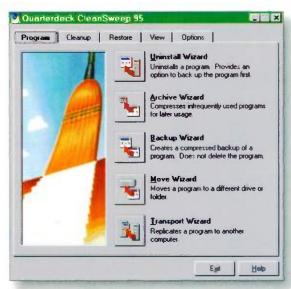
WINPROBE 95

Many people have discovered the *MSD* (*Microsoft Diagnostics*) program that comes with both Windows 3.1 and Windows 95. This can give you basic information about your processor, BIOS, memory, graphics card, IRQ usage and so on. Although useful (and free), this is looking rather long in the tooth now, and when fault-finding, something more 'rigorous' is needed. *WinProbe 95* is, as its name suggests, designed to probe deeper and return more information. As well as providing extensive system information (including stress tests designed to weed out rogue hardware that causes very occasional inexplicable errors), the software offers the Recovery section, which helps your PC recuperate from bad

crashes by backing up vital system files and placing them on a floppy, so that you can restore them later if anything gets corrupted or accidentally deleted. The Registry Guru allows you to edit many system files (after giving dire warnings to back them up first!), but this aspect is likely to appeal more to seasoned explorers than casual peekers. Tune Up offers you the opportunity to optimise the Registry, stripping out references to programs that are long gone, as well as allowing various tweaks to be easily made to the system. Knowledge Base is an extensive point-and-click guide to Windows 95, which includes details on making the best use of applications, explains the Registry and INI files, and offers a fairly comprehensive step-by-step guide to installing new hardware, which includes adding memory, disk drives, soundcards and so on. This is well-written, and worth a browse if you want to know more about the PC. Another very useful item is *CrashShield*, a tiny application that runs in the background all the time, which pops up if an application crashes, allowing you the option of saving your work before shutting down the offending program. This can be a godsend, and other *SOS* contributors have also been pleased to see its little window save the day.

CLEANSWEEP v3.0

One of the most annoying aspects of modern software is the way that it seems to add files all over the place — if you want to remove an application, it is normally impossible to track down every change that the previous installation has made to your system. With so many 'free' CDs falling off every PC magazine, the temptation to try out a few pieces of software is irresistible. After several months, despite your best efforts to maintain order, your hard disk can begin to resemble the contents of a car boot sale. Enter *CleanSweep 95*, an uninstaller from Quarterdeck which claims to remove the software that other programs can't reach. It does this mainly ▶

CleanSweep may show a big brush, but that doesn't stop it weeding out even the tiniest unused files that lie in the crevices of your disk drive. If you feel like spring-cleaning, this is the one to go for.

"After several months, despite your best efforts, your hard disk can begin to resemble the contents of a car boot sale."

ESSENTIAL ACCESSORIES FOR THE PC MUSICIAN

▶ by monitoring and logging new installations, and recording every new file placed on your hard disk, but, just as importantly, it also records any changes or additions to the Registry. During the month I have been using it, it even informed me on several occasions of badly-behaved setup programs that installed older versions of system files over the top of my existing ones! Once the logs have been created, you can uninstall any monitored application far more thoroughly than via the standard Windows uninstall, and effectively return your machine to exactly the state it was in previously. *CleanSweep* has not failed me yet, and makes life far less harrowing when you want to clear out a program that does not live up to expectations. In addition, the software will analyse any non-logged

YOUR NUMBER ONE FAN? — PAPST VARIOFANS

Although these ventilating aids fall into the hardware camp, they can be so useful to musicians that they qualify for inclusion in this article. Although for general office use the noise from the average PC is bearable, in the analytical atmosphere of the recording studio it can vary from annoying to exasperating (see the feature on reducing computer noise in *SOS* January '97). On most machines, the main source of noise is the PSU cooling fan. These are designed to pull air into the PC case through small holes or vents (normally in the front). This airflow passes over the circuitry, removing heat which then emerges as warmer air through the output side of the fan on the back panel. There are two main problem areas: firstly, all but the more expensive machines permanently blast out enough air to cool the machine in the worst conditions (in the Sahara in the middle of a hot spell in mid-summer). The majority of the time, far less airflow is needed to keep the circuitry running at reasonable temperatures. Secondly, no-one can blame

manufacturers for trying to keep prices down by using the cheapest fan they can source. Cheap fans tend to have bearings that make far more noise in the first place — and may even get noisier with age.

For musicians with this problem, there is a solution in the form of the Papst VarioFan. These are extremely well-built, with high-quality bearings for low noise, but more importantly, they are designed to be controlled by a temperature sensor, so that the fan speed varies, only providing enough airflow to maintain a steady PC temperature. As the PC heats up, or the ambient temperature rises, the sensor turns up the airflow to compensate. The result is that most of the time the fan noise is barely above a whisper, and even in the middle of summer the noise is well below that made by cheaper fans. These units come in various sizes, the most common being 80mm. Some models have built-in sensors, so fitting them means simply replacing the fan itself (using four

screws) and soldering in the two fan wires to replace those of the previous one. If the sensor is supplied separately, then the fan has three wires, and the third connects to the external sensor (the other end of which goes back to the negative wire of the new fan). As usual, I must point out that there are potentially lethal voltages inside computer power supply units, but if you are not sure about replacing the fan yourself, I am sure that many computer specialists would be happy to do it for you for a small charge — it should take less than half an hour. Papst also have smaller fixed-speed fans for replacing most 'processor-top' units with quieter versions, but it is sometimes possible to buy larger heatsinks and do away with the mini-fan altogether (although these may get in the way of your expansion cards, so take advice and check first). My machine has gone from sounding like a vacuum cleaner permanently running in the next room to a gentle purr — highly recommended!

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applications, looking for components and changes to system files, and uninstall those for you as well. It can also move any application to another folder or drive, updating all of the appropriate links (far quicker than deleting and then re-installing!).

Other parts of the *CleanSweep* cleanup campaign include options for finding duplicate files, redundant DLL (system) files not used by any application, and orphan files that have been left behind by rogue applications. Finally, by monitoring which files are used on a day-to-day basis, *CleanSweep* can also worm out files that have not been accessed for a specified time, which may be worth deleting, unless you happen to know that you need them. It recommends backing up all files first (in compressed form), and then if no application complains of a missing component, you can safely delete the backups at a future date. In the month that I have been using *CleanSweep*, I have reclaimed 80Mb of disk space!

HEALTHYPC
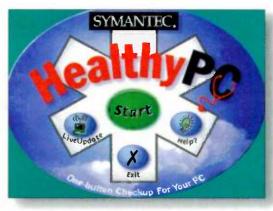
This is a low-cost utility from Symantec, the publishers of *Norton Utilities*, which gives your PC a basic check-up, and operates from a single button click. Although the software is designed to be simplicity itself to operate, the underlying tests are quite thorough. Firstly, the software incorporates a

virus checker that can receive live updates via the Internet — a very good way of ensuring that it stays up to date in the battle against bugs (and bear in mind that Symantec also produce *Norton Antivirus*, so they know what they are doing in this area). The hard drive is scanned for errors and then defragmented. Although Windows 95 has utilities to do this, the Symantec ones tend to be more thorough and a lot faster to use. *HealthyPC* will also check for and report any more serious problems that it finds, even if it cannot repair them itself, enabling you to seek further help before things get out of hand. If you don't want to spend hours 'under the bonnet', this one-click approach is ideal. It may not be macho, but you'll end up with more time creating music!
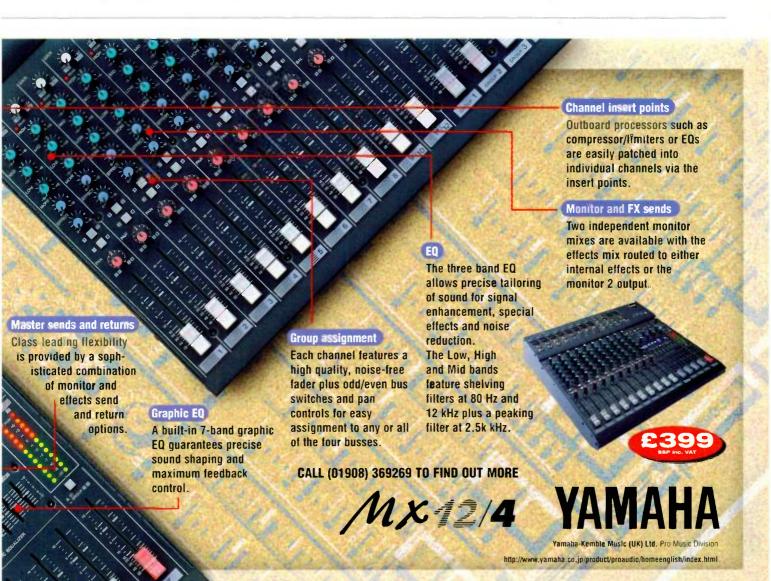
NORTON UTILITIES 95 v2.0

This must be the most comprehensive and well-known utility package available for the PC. It was first introduced in 1982, and has been systematically improved and re-written many times over the years as new operating systems appeared. Version 2 of the Windows 95 package has only just been released, so it even has provision to check for MMX processors, ▶

Healthy PC may not look complex, but there is a lot going on under the surface. Its range of checks include virus hunting, disk checks, repairs and defragmentation.

Norton Utilities' System Doctor. This runs in the background, monitoring for viruses, disk problems and plenty of other user selectable options. Levels can be set beyond which the user is alerted to potential problems.

▶ and the latest FAT32 disk filing system (only available in OEM versions of Windows 95 to date). The main component is System Doctor, which is designed to run all the time in the background, checking for viruses, and periodically monitoring your processor overhead, disk drive space and fragmentation, memory use and so on. Each monitored function has its own indicator and alarm setting, so that if anything untoward happens it will let you know, launching the appropriate utility to try to put things right. Symantec call this approach 'self-tuning' your PC. The package includes a range of other components, including new Registry tools, multimedia benchmarks, a virus finder which can automatically dial the appropriate web site and download updates, and File Compare, which lets you load two files and see their differences, which is very useful if you have two versions on disk, and no idea why. The more familiar parts are still there — Disk Doctor allows extensive troubleshooting, and has helped many a drive return from the dead, although beginners may find it rather intimidating at first. Speed Disk is a far faster and more thorough defragmentation program than the one supplied with Windows 95, even allowing you to specify files that must not be moved (like the dreaded protection file for the Sound Forge *QTools* plug-in). Space Wizard operates rather like part of *CleanSweep*, searching for temporary, little-used or duplicate files that can safely be removed to give you more disk space. System Information supplies just that — it's similar in many ways to *WinProbe 95*, and also includes various benchmark tests.

The Companion button takes you to a full multimedia tutorial, explaining all aspects of PC hardware and software, both as text files and as audio/video clips that run from the CD-ROM. *System Genie* is another multimedia tutorial which guides you through many tweaks that can be made to the Windows interface. Diagnostics is an MS-DOS program that runs rings around Microsoft's *MSD*, finding system settings, IRQs and so on. Norton Unerase is a more rigorous alternative to the standard Windows 95 Recycle bin, allowing you to recover files that have been accidentally deleted. Crashguard operates like CrashSnield in *WinProbe 95*, monitoring your system and intercepting system crashes. There are even two Emergency floppy disks supplied, which enable you (in conjunction with the manual) to get up and running even if you can't get your machine as far as installing *Norton Utilities*.

This suite of programs is probably the most comprehensive that you can buy for Windows 95 but, like most things in life, it comes at a price. In this case, it is not so much the retail price of the package which, at around £80, is good value when you consider the amount on offer, but more the system overhead required to run the software. Whilst Speed Disk, Space Wizard, System Information, Norton Companion and so on work beautifully, System Doctor, whilst only having a tiny processor overhead, occupies 7Mb of your memory whilst running, and is designed to run in the background all the time. This is fine if you have plenty of memory, but could compromise your system performance if you only have 16Mb on board. Also, the full install runs to 31Mb of space, and some components, such as System Genie, require *Microsoft Explorer* to be installed, adding unnecessarily to your hard drive if (like me) you use Netscape's *Navigator* for your web surfing instead. I found that about 50Mb of my drive disappeared after installing everything! Finally, like any deluxe system designed to cope with virtually any scenario, it is possible to alter files that can prevent your system booting up at all. *Norton Utilities* makes extensive backups, and is friendly and easy to use, but just because you have a scalpel, you are still not a qualified surgeon. Don't underestimate the power of this package.

FIRST AID 95 DELUXE

Manufacturers CyberMedia have taken a different approach with this utility. It is designed for 'non-experts', and can fix software problems automatically. For people who would rather get on with making music, this makes a lot of sense — certainly, I have spent an awful lot of time delving into the innards of my PC while preparing these reviews, so I was interested to see *First Aid 95 Deluxe* in action. Most Windows problems are caused by software — missing or corrupted files being most common. Fix Applications looks for these using an extensive database which contains information about specific products. Although this is ideal for troubleshooting mainstream programs, they rarely contain details of specialist music software, so checking for these is limited to looking for the main components of the application. In its favour, the database has free updates that can be obtained from the Internet, and there is even an Update button to take you to the appropriate site automatically. Fix Multimedia is the main reason that I wanted to look at this utility, since it is the only one here that specifically offers to fix soundcard, CD-ROM and game problems. It does this by asking you to specify your soundcard from the Windows 95 device list, and then checks all the appropriate drivers before running some basic audio checks for WAV, MIDI, AVI and CD-Audio outputs. If you do not get any output for one of these, a selection of possible ▶

▶ causes is displayed, each with a suggested solution. For WAV replay problems, these included adjusting various volume controls and connections — all pretty basic, but useful when you are in a panic. What I wasn't expecting was that the same set of suggestions came up for MIDI problems. For the average multimedia user with everything on one soundcard, this may just be sufficient, but I was expecting something more comprehensive. Perhaps in the next update?

Clean Windows was very useful, and it found quite a few niggly little problems that I had missed — things like shortcuts that pointed to long-since-deleted programs and missing files that should have been associated with a particular file extension. Crash Proof PC is our old friend the fault interceptor, which works just as well as others included in *Norton Utilities* and *WinProbe*. Tune Up PC checks for the best settings in the performance section of the PC control panels' System section; when I ran this utility, the software noticed that my CD-ROM had not had its cache re-optimised after I had re-installed Windows 95 following a particularly nasty incident. Again, for the novice, this one-button approach can be far easier than delving in yourself.
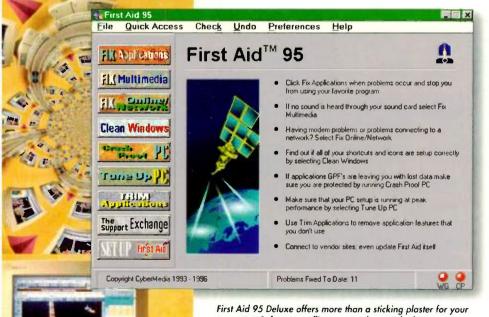
Trim Applications offers to give you more disk space by removing features from applications that are no longer required. Since *First Aid 95 Deluxe* does not monitor installations (like *CleanSweep*) it tends to be conservative, removing only the main EXE file and associated DLL files, unless the application is in its database, in which case more thorough treatment can be selected. The files can be saved in compressed format before they are deleted, allowing later restoration. The Support Exchange is an excellent idea, giving access to a database with contact details for hundreds of companies, even allowing you to click on the website address to launch your browser, in search of driver updates and more fault-finding tips. Not only are business software houses represented, but also games publishers, as well as many more familiar names from the world of music technology, such as Akai and Et Cetera — but there's still no mention of either Emagic or Steinberg! RetroFix monitors changes to System and Registry files, and lets you view any subsequent changes in a very clear way, which makes it easy to restore them if something untoward happens.

BENCHMARKS OUT OF TEN

Each of these utilities has its own strengths and weaknesses, and each will suit a different sort of user. Of the diagnostic packages, although all are easy to use for both beginners and experts, *First Aid 95 Deluxe* is the only one that is designed to fix problems automatically, and for this reason, it should appeal to anyone who wants problems solved without necessarily knowing how. It is the only one of the three specifically aimed at software conflicts and, since these cause so many problems, this aspect scores highly. *First Aid 95 Deluxe* is also the only one to offer any advice at all for soundcard problems. *HealthyPC* provides basic checks on hardware and viruses, and is ideal for those who just want to drive rather than being under the bonnet all the time. *WinProbe 95* provides detailed tests and lots of background information useful to anyone installing hardware. The options for stress-testing, optimising the Registry, and intercepting general protection faults are valuable too. If you already know your way around the PC, this package gives you much more information, and so is ideal for those of a technical bent. Finally, *Norton Utilities 95* is probably the most comprehensive set of hardware diagnostics and optimisers you can buy. As long as you approach it carefully, it can provide recovery from most hardware problems, but does occupy a lot of disk space if you install everything, and you may end up losing plenty of time in the Twilight Zone whilst exploring it. Comparing the four, you could say that *HealthyPC* provides a quick weekly check-up, *First Aid* is your own on-board software technician, *WinProbe* is more of a stethoscope and hardware manual, and *Norton Utilities* is a fully equipped electronics lab.

CleanSweep makes installing new software far less harrowing, and is wonderful for reclaiming lots of wasted disk space. Many Uninstall routines supplied with applications neglect to remove their Registry entries, leaving the Registry unnecessarily cluttered and bloated. I would not like to be without this program now — what more can I say? As for *Partition Magic*, this is a must for hard disk recordists. Not only does it provide a 'clean' area for audio files, but also gives you more effective space on your hard disk. Then there are the Papst fans. Although the cheapest item here, they can significantly improve the noise level in studio environments. With the appropriate purchases, you could have a PC that is fault-free, bigger, cleaner, and quieter (see the 'Your Number One Fan?' box elsewhere in this article). Nirvana indeed!

"With the appropriate purchases, you could have a PC that is fault-free, bigger, cleaner, and quieter. Nirvana indeed!"

First Aid 95 Deluxe offers more than a sticking plaster for your computer. Software conflicts are gently smoothed away, leaving your PC clean, fresh, and ready for action again.

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Making Waves

SOUND SYNTHESIS ON A COMPUTER

Designing sounds on a computer can give you virtually all the knobs and sliders you'd want, but there's the potential to go far beyond hardware synthesis too. DENNIS MILLER begins a two-part tour of what's available.

As every electronic musician knows, there are an awful lot of computing resources residing in the synths and samplers we all use. But what if you could harness much of that power and design original sounds on your computer with the ease of using a patch editor? With the CPUs of modern personal computers rapidly increasing in power, and new programs appearing to direct that power towards creating music, sound synthesis on the desktop is becoming more practical than ever.

This two-part article will cover many of the methods available for creating sound directly on a PC. I'll start with some simple programs that provide a software-only sound engine for playing MIDI files, then discuss programs that simulate vintage analogue hardware. Next we'll move to graphic sound-design software, which offers vast potential for synthesis, and finally some high-end technologies which require additional hardware to supplement your computer's own resources. Many of these programs are in beta or have just been released, so keep your eyes on the web sites for updates and enhancements. And bear in mind that although I'll focus on Windows applications, several of the programs are available for the Mac as well.

TYPES

Sound synthesis software comes in several flavours. First are the programs that use a text-based interface, requiring the user to actually write 'code' that describes the sound; this code is compiled into soundfiles which are stored on your hard drive and played back at will. Because there are hundreds of sound modules in the current versions of such programs, they are very powerful tools for working with sound. There are other non-real-time programs that use a more graphic interface, where sound-producing or sound-processing modules are 'wired' or patched together on the screen. Depending upon the types of functions that the program makes available, this approach can be very powerful as well.

Look around the Internet and you'll also find many new programs that actually turn your computer into a virtual synthesizer. Though there are

several variations on this theme, the basic idea is that as you turn the knobs or move the sliders provided in the program, sound is created instantly. Another approach uses stored wavetables to play sound on demand; in effect, you use these programs' 'presets' to play the MIDI data you wish to hear. In the final category are hybrid systems that combine additional hardware with sound-design software. This category appears to be growing quickly, though one system stands out as the clear leader.

GOALS

Why bother to program sounds on a computer when you can flip a switch on your synth and have access to hundreds of sounds? Because software synthesis has the distinct advantage of being extremely flexible and open-ended. While today's synthesizers and samplers are certainly extremely powerful, there are still limits to the type and manner of sound production that you can employ using such devices — in essence, you can't use synthesis method x if the manufacturer doesn't want you to! With the more sophisticated software synthesis programs, such as *Virtual Waves*, *Csound* and the *Kyma* System, you can create an unlimited variety of sounds using every major synthesis technique available today.

Another advantage of software synthesis is upgradeability. Though several newer synths offer Flash ROM upgrades (upgrades on a disk), new sound-producing modules and other updates can easily be downloaded and installed in software-based programs. Then there's sound quality. With the proper hardware, the sound created by any of these programs can travel directly to a DAT recorder, a sampler, or a CD recorder without ever going through an analogue stage. Very few external sound modules offer that option today. And of course anyone who's ever used a patch editor or librarian will know that working at the computer beats staring into a 2-inch LED screen, especially when you're configuring dozens of parameters.

When all's said and done, everyone should be able to find something of interest and begin to experiment with this whole new way of creating sound. As you'll see, the possibilities are endless.

VIRTUAL SOUND ENGINES

In our first group of synthesis programs, two of the three applications operate by hiding in the background and producing sound when you send them MIDI files or note data from an external controller. Yamaha's *S-YG20 Soft Synthesizer* and Roland's *VSC550W Virtual Sound Canvas* offer little or no patch-editing capabilities, but instead provide numerous preset sounds for use in your scores.
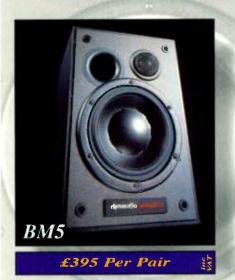
• YAMAHA S-YG20
The *S-YG20*'s sound engine offers up to 32 voices of polyphony at a maximum 22kHz sampling ▶

BEGINNINGS

Software sound synthesis first became a viable technology when Max Matthews and his colleagues at Bell Labs in New Jersey developed a computer language for programming sound in the late 1950s. Matthews' approach was modelled along the lines of the traditional electronic studio of the day: it used software modules such as reverbs, filters and oscillators which could be 'patched' together in any combination. The composer specified the design of the sound using these modules, and the resulting design was compiled into samples by the programming language. The tape containing the samples (there were no hard disks at the time!) was then usually taken to another computer, often at another facility, where it could be converted into actual sound. Digital-to-Analogue converters were very rare at this stage of the game.

Matthews' first programs became known collectively as the *Music N* series, as he named them in the sequence *Music 1*, *Music 2*, and so on. Soon, other research institutions and universities — the only places with access to the necessary hardware — got into the picture and either modified Matthews' code or developed their own. Currently, there are several programs available that are direct descendants of Matthews' original work, most notably *Csound*, which I'll cover in the second part of this survey.

SOUND SYNTHESIS ON A COMPUTER

▶ rate. All audio is 16-bit, and there are over 300 XG-compatible presets plus a number of drum kits to work with.

Effects are limited, and the MIDI file player that's included is very basic. And though it can generate sound under the control of your existing MIDI applications, you can't use a digital audio sequencer such as *Cakewalk Pro Audio* without disabling that program's audio playback. That's because only one application can have control of your soundcard at any given moment. The current downloadable version is also labelled a 'trial version', so there's no support available — don't expect too much from this program until it becomes a fully released product.

W http://www.yamaha.co.uk/html/midiplug/m_mid6.htm

• ROLAND *VIRTUAL SOUND CANVAS*

Roland have been interested in putting sound-producing capabilities on your desktop for some time, and their *Virtual Sound Canvas (VSC)* should appeal to many novice musicians. Like the *S-YG20*, the *VSC* creates multi-channel sound data on the fly, so you'll need a minimum setup of 8Mb of RAM running on a Pentium 60; even more effective would be a Pentium 100 or better with 16Mb of RAM.

Figure 1: *The DoReMix2 pattern sequencer that ships with Roland's Virtual Sound Canvas provides numerous preset musical phrases for building sequences.*

The *VSC* creates 16-bit stereo audio using up to 128-voice polyphony at either 11 or 22kHz sampling rate, and allows you to choose how much of your computer's horse-power you wish to dedicate to the task. To use the *Sound Canvas*, simply install the program, then select the *VSC* driver as the output for any MIDI program you have on your system that doesn't incorporate digital audio.

Included with the *VSC* are several basic applications, such as the *DoReMix2* Musical Pattern Software. This program offers a 7-track sequencer-style track sheet for creating phrase-based compositions (Figure 1). There are dozens of pre-existing phrases (actually just short Standard MIDI Files) that you can pick from among the various musical styles shown in the Phrase Directory, but no direct editing of the note data is allowed. In the Mixer window, you can assign volume and pan settings for each track, and specify Reverb and Chorus amounts on a track-by-track basis. The program uses what it calls 'frames'

as its time base — there are no measures per se — and you can specify different settings for each frame of your composition.

Overall, the *VSC* package is very user-friendly and can fill in when you need some quick and dirty background music. I especially like building a tune by dragging the phrase icons onto the workspace, and the sound quality is certainly as good as on many Windows soundcards. But the system is clearly aimed at beginners, and pro users won't find much of interest. This is due above all to the time-lag that the *VSC* and most other real-time programs impose when generating a sound. If you play in from an external controller, for example, you'll detect a clear gap between hitting the key and hearing a sound. Even using a sequencer with a screen that scrolls during playback can affect the *VSC*'s ability to keep accurate timing, so don't plan on doing any tight cueing with your video deck. As the *VSC* manual says, "For high-quality, stable (sic) playback, we recommend that you use an external GS sound module." Not quite a strong vote of confidence.

W http://www.roland.co.uk/intl.htm

• *REALITY*

Seer Systems, headed by longtime MIDI luminaries Stanley Jungleib and Dave Smith, developed the first commercial software synthesizer in 1992, and have recently shown a new program that should appeal to professionals and amateurs alike. *Reality* is a software synthesizer that allows you to build sounds using numerous modern synthesis methods simultaneously, and play them back with an external controller or any MIDI program on your PC. The company has done extensive work to lower the latency (time-lag) of the sound engine: according to their claims, the response time is as good or better than most professional synths.

Reality will offer capabilities that go far beyond what you'd find on an outboard synth. For example, you can assign up to six patches to a zone, and up to 128 zones to a key map, which the company calls a PatchWork. Each patch can have four oscillators, four filters, and four LFOs. You can load and process wave files off your disk up to a full gigabyte in size for a true disk-based sampler, and of course there's extensive mapping of controller data, regardless of the source, for various patch parameters. As in any real-time application, the total polyphony you'll get depends on the complexity of the sound you're producing and the speed of your computer.

Reality's Capture mode will allow you to record the program's output directly to your hard drive, and numerous physical models, including guitars, flutes, bells, and various keyboards, will be included when the program ships this spring. The initial release will only support 16-bit soundcards from Creative Labs, including the new digitally-equipped AWE 64 Gold, but future versions will be available for other Windows audio hardware.

W http://www.seersystems.com/pages/profprod.html ▶

SOUND SYNTHESIS ON A COMPUTER

> "As I sat for hours, listening to the synth's output through my studio monitors, I dreamed of glorious days gone by…"

▶ ### ANALOGUE EMULATION SOFTWARE

Next we'll look at a group of synthesis programs that turn your computer into a real-time analogue synth complete with buttons and sliders. These programs, which are mostly shareware, draw heavily on your computer's CPU for their power and will vary in their performance according to the computing resources you have available. On my P133 with 24Mb RAM, they all work perfectly well outputting mono audio at 16-bit, 44.1kHz when receiving their note data from internal sources. But in several cases, sending data from my MIDI keyboard resulted in a half-second delay. This improved somewhat when I lowered the output sampling rate.

• VAZ

VAZ, or Virtual Analog Synthesizer, provides a screen full of sliders that can be used to control the oscillators, filters, variable waveform LFOs, envelopes, and modulation routings offered by the program (Figure 2). You can tune the base pitch of the two oscillators using 2-foot to 32-foot pipe length increments (!), design 4-stage envelopes for controlling various synth parameters, or apply FM to either oscillator. Using any of the numerous modulation sources to sweep the filter's cutoff frequency produces a sound known and loved by many of our generation, while classic ring modulation is easily applied by selecting it in the Mixer Control Source window.

A second screen is used to build note patterns containing up to 16 steps. Each step has its own portamento and accent setting, and you can move easily around up to eight patterns at once. Functions for randomising the note sequence in individual patterns are provided, and you can also randomise the order in which the patterns play back. The program includes several basic tutorials to get you started and numerous example files on disk. The free shareware version has somewhat limited capabilities, such as disabled patch saving, but the inexpensive registration fee is well worth paying — all in all, a nicely done program!

W http://www.cp.umist.ac.uk/users/martin/vaz.html

• RUBBER DUCKIE

Rubber Duckie, an analogue emulator from DeLusion, has some special tricks, which include playing back a wave file from disk while its synth section is running. You can change the volume of the wave file in real time, or adjust its speed as it plays back. The speed adjustment produces very clean results without the artifacts normally associated with this type of processing, and the slider you use to make the changes responds

Figure 3: ReBirth models the Roland 303 and 808 with all the buttons and knobs of the originals.

remarkably well. There's also a Sync option which restarts the wave file every time your note pattern cycles.

Like the other synth programs, *Rubber Duckie* is loosely modelled after the TB303 and offers a single oscillator with a sweepable resonant filter, plus a sequencer section for triggering notes. There are six sliders to control various parameters of the filter, such as cutoff frequency, attack, decay, and resonance, plus a delay module that's adjustable from 1 to 1000ms. Patterns can be copied and pasted among the 14 available pattern slots, and various note parameters can be randomised independently. The full registered version adds the ability to capture the program's output to disk.

W http://www.waste.uni-essen.de/d-lusion/

• REBIRTH

The real king of analogue emulators is *ReBirth RB338*, a commercial program from Propellerhead Software. This software uses a graphic interface that resembles two TB303s and a TR808 drum machine on a single screen, and comes complete with all the buttons, switches and knobs of the originals (Figure 3). *ReBirth* produces a sound that is remarkably similar to that of its analogue ancestors, and as I sat for hours, listening to the

synth's output through my studio monitors, I dreamed of glorious days gone by...

ReBirth works with a standard Windows soundcard (which is how I tested it) but should run even more smoothly if you have Microsoft's new DirectX extensions installed. You can load multiple instances of the program simultaneously, though only one can be active, and I experienced no glitches or hiccoughs using my mouse to switch among five modules. The controls on the screen are a bit small and can't be adjusted in the demo version (an early, pre-beta release), but, in general, it's very easy to create patterns and adjust the various settings offered by the program. The interface should be more configurable when the ▶
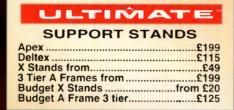
SOUND SYNTHESIS ON A COMPUTER

▶ final release ships, and you'll also be able to save the program's output on disk as a WAV or AIFF file in the shipping version.

W http://www.propellerheads.se

SOUND DESIGN SOFTWARE

The next group of options includes two simple programs that offer only basic synthesis capabilities, plus four applications that allow you to build sounds using multiple synthesis methods. Don't expect real-time playback here, however. Instead you'll be

Figure 4: Stomper is especially good at creating drum sounds, but provides 32 oscillators for creating other types of sounds too.

creating wavefiles that you can download into your sampler or the sample memory of your soundcard, or simply use alongside MIDI in an integrated MIDI and digital audio sequencer.

• SUBSYNTH

As its name implies, *SubSynth* uses subtractive synthesis to create sounds according to your specifications. The program employs a very simple model that includes two oscillators fed by a pair of LFOs, a mixer, time-varying filters, and an output. The pulse width of the oscillators is continuously variable from 100%, which would produce a square wave, to 1%, which is a simple impulse train, and the waveform can change over time if you use the LFO to modulate it. Pitch selection is via MIDI note values, with an additional fine-pitch setting available for Oscillator 1 and an octave-shift

setting for Oscillator 2.

The filter section offers frequency (adjustable in ¼-octave steps), resonance, and modulation depth controls, as well as a choice between second- and fourth-order harmonics (for altering the amount of high-frequency attenuation). Though not the most sophisticated program of its type, *SubSynth* does a good job of creating simple, analogue-type sounds.

W http://www.users.dircon.co.uk/~martin-s/

• STOMPER

Stomper, by ZAP, is intended to produce analogue drum sounds, and it provides just the right tools to get that job done. But there's more flexibility here than you might imagine: sounds can be of any length and can have very complex, time-varying qualities, for example. I moved beyond drum simulations very quickly and designed some long, evolving analogue sounds that I intend to transfer directly to my Kurzweil K2000.

Stomper provides 32 oscillators for building your sample files, and by copying and pasting waveform parameters, you can quickly build fairly massive textures. Each oscillator has independent start and end times, in addition to frequency and amplitude envelopes, and as you create multi-layered sounds, you can solo each waveform to hear it out of context. The program's graphic interface allows you to draw curves for the various parameters of each waveform, in addition to entering text or moving sliders to set their values (Figure 4). When everything is properly defined, you press the Play button; after a slight pause, you'll hear the sound, which you can save to disk. You can also save just the design of the sound, and many design examples are included with the program.

Stomper is freeware, but the author requests that you send him copies of any music you make that includes 'Stomped' sounds. Seems like a reasonable exchange for a program that's this much fun to use!

W http://www.lysator.liu.se/~zap/stomper.html

• AUDIO ARCHITECT

Audio Architect, from the Karnataka Group, is a developing product that should have a number of enhancements by the time you read this. Currently, version 1.0 offers several synthesis modules including an oscillator that can produce sine, saw ▶

SOFTWARE SYNTHS AT A GLANCE

PRODUCT	VERSION	MANUFACTURER	COST	WEBSITE
S-YG20 Soft Synthesizer	beta	Yamaha	not available yet	http://www.yamaha.co.uk/html/midplug/m_mid6.htm
VSC550W Virtual Sound Canvas	1.0	Roland	$99	http://www.roland.co.uk/intl.htm
Reality	beta	Seer Systems	$495	http://www.seersystems.com/pages/profprod.html
VAZ	alpha 8	Martin Fay	free	http://www.cp.umist.ac.uk/users/martin/vaz.html
Rubber Duckie	0.85B	DeLusion	$15 or 20DM	http://www.waste.uni-essen.de/d-lusion/
ReBirth	alpha 3	Propellerheads	$199 when available	http://www.propellerheads.se
SubSynth	1.01	Martin Stone	£12	http://www.users.dircon.co.uk/~martin-s/
Stomper	0.97B	ZAP	free	http://www.lysator.liu.se/~zap/stomper.html
Audio Architect	1.0 evaluation	Karnataka	free	http://www.karnataka.co.uk/aa/
FX	1.5	Nick Jones	free	http://www.winsite.com/info/pc/win95/sounds/fx15.zip
Wavecraft	1.0	AudioVirtual	£29	http://www.lastunicorn.com/wavecrft.html
Virtual Waves	2.0	Synoptic	$199	http://www.synoptic.net/vwaves.htm

You'll find that many of these sites are listed on the page: http://www.xs4all.nl/~rexbo/pc_synth.htm

SOUND SYNTHESIS ON A COMPUTER

Figure 5: The workspace in Audio Architect is used to wire together any number of sound modules.

▶ and square waves plus noise; an 8-tap FIR filter, a 4-input mixer, and an ADSR envelope generator (Figure 5). These modules can be varied over time, and a 16-step sequencer unit that can run three independent 'channels' simultaneously is also available as a control source.

Just as in the next three programs of this type, icons that represent the various sound components are arranged on a workspace and patched together. The program then compiles your sound into a file on your drive at any of the common sample rates. There's no way to play your sounds directly from within the program (to be remedied in the next release), and you must set the sample rate for every sound individually (a global setting would be useful), but the program provides enough tools to make some interesting sounds, as the included examples make clear.

W http://www.karnataka.co.uk/aa/

• FX

FX 1.5, by Nick Jones, is a free program that provides several dozen modules for designing sounds. The interface consists of a group of icons, which appear on the left of the screen, and a work area for hooking them together on the right (Figure 6). You'll find a 'Wavgen' module for generating several common static waveforms, complete with an input control that can modulate the waveform's frequency over time. There's also a noise generator which can be filtered to create any band of frequencies you need, and a plucked string model with variable damping and frequency controls.

On the processing side, *FX* offers a delay line, low-pass and high-pass filters, and reverse, distort and echo effects, among others. Several mathematical functions can be included in your design, to process sounds or create control signals, while a mixer, envelope generator and faders are also part of the basic arsenal. Another useful function is the sequencer tool, which allows you to sequence up to 14 audio files from your hard drive and trigger them repeatedly. Files can overlap in the sequence, which can be repeated any number of times. The program includes thorough on-line help and several well-documented examples. And you can't beat that price!

W http://www.winsite.com/info/pc/win95/sounds/fx15.zip

• WAVECRAFT

Wavecraft, which was covered in *SOS* back in October, 1996, is a synthesis program that's especially well suited to creating analogue-style sounds. The shareware version has somewhat limited capabilities, but provides ▶

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SOUND SYNTHESIS ON A COMPUTER

▶ a good orientation to the program. For example, to design a looping techno sound, load an oscillator and any filters you want, then use the 16-note sequencer to control its frequency. Next, trigger the sequencer with a clock source, where you've set your desired tempo. To vary the clock's speed, design an envelope using the 8-stage envelope generator and wire it to the clock, then send the oscillator's output to the File Dump icon (the program's output module), and generate the soundfile. Save the file to your disk if you wish, or return to the design to make any additional modifications.

Analogue synth fans will appreciate *Wavecraft*'s Glide Generator, which adds a bit of portamento to notes that are triggered by the sequencer, and its Sample and Hold function. The 'voltage controlled' amp and the numerous control sources will also come in handy. Though *Wavecraft* doesn't provide modules for many different synthesis methods, it's very good at what it does and offers numerous examples that you can tweak or use straight away. A recent dramatic price reduction make the program exceptionally good value.

W http://www.lastunicorn.com/wavecrft.html

• VIRTUAL WAVES

The most advanced software synthesis program in this group is surely *Virtual Waves 2.0* from Synoptic. This French program, which is offered in an excellent English translation, provides synthesis options that I have yet to see on even the most advanced hardware synthesizers. For example, the FOF generator, based on the fixed-formant synthesis

which provide audio or control signals that you'll use in your sounds. Among the 16 different editable audio sources are an 8-partial additive synthesis tool which displays the composite waveform as you alter the amplitude and frequencies of each partial, and a 6-operator FM synthesis module which includes 32 preset algorithms for creating an infinite number of time-varying spectra.

Rather than generate note events, which is the more common approach, *VWaves'* Cellular Automata function allows you to build sounds by specifying 'rules' that control their spectral content. This 'algorithmic sound generator' combines up to 32 different partials, which are turned on and off according to the criteria you set. If you're interested in physical modelling, *VWaves* provides both string and reed models to experiment with — or if you've always wanted a Korg Wavestation but couldn't cut the price, you can try the 50-step Wave Sequencer, which offers many of the settings used in the Wavestation's wave sequence element.

Among the processes you can use to alter your sounds are familiar effects such as a flanger, delays, and a compressor/expander, plus a reverb section with an endless number of settings. I especially like the reverb's ability to model various room characteristics, such as room length, width and height, but the real gem is that you can specify the absorption materials for each of four walls — these include marble, plaster, glass, and concrete. A Harmoniser module offers 5-part pitch-shifting of a source signal, while the time stretcher, which allows a sound to be expanded up to 200%, produces cleaner results than most others I've heard, especially when stretching long sounds.

Less familiar editing options include Cut-up, which granulates a sound by adding silences or removing chunks of the sample at specified intervals; and Metamorphosis, which morphs two sources by either interpolating the sounds' spectra or replacing the frequencies of the first with those of the second sound. Vectorial Mixer is modelled after the vector synthesis routines of some Yamaha and Korg hardware, and allows controlled mixing of up to four sources.

Working with *VWaves* is simply a pleasure. It's loaded with shortcuts that get you to your goal in a minimum of time — such as a sound design 'assistant' that automates the creation of many types of sounds — and, except for the addition of an Undo feature, I can't imagine how it could be improved. The CD-ROM is loaded with great-sounding samples that you can use as source material, and the on-line tutorials cover many major functions of the program. This software is far and away the best in its class!

W http://www.synoptic.net/vwaves.htm

Figure 7:
Virtual Waves' toolkit offers a vast number of synthesis capabilities including some of the most advanced techniques of synthesizing sound available today.

technique developed at IRCAM, is a powerful tool for synthesizing speech sounds, while the Spectral Scratchpad, where you can draw or 'spray' a sound's spectrum onto a blank slate, is unlike anything I've seen. Combined with an excellent user interface, dozens of example files and thorough on-line help, these make this program an easy winner in the graphic sound-design category.

VWaves' toolkit is organised into three main groups (Figure 7). First are the Generator Modules,

This concludes the first half of our software synthesis survey. Next month I'll cover a number of systems that add hardware to your PC to accelerate the sound creation process, as well as taking a close look at *Csound*, the most powerful sound-programming language available. Stay tuned! **SOS**

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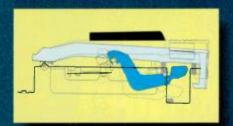
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M A S T E R K E Y B O A R D S

The latest MIDI and sampled percussion combination from Akai is the first not to feature Roger Linn's signature, although it clearly takes its inspiration from those that do. But PAUL WIFFEN discovers that, although this unit adds a feature he's been waiting 10 years for, it's missing the high price tag of its predecessors.

Previously on *The Sampling Drum Machine Story*: although I've never been asked to review an Akai MPC unit before, I have extensive (if vicarious) experience of their use, as two of my musical collaborators have been keen MPC60 and MPC3000 users. The fact that both of these chaps started their musical careers as drummers attests to the success of Roger Linn's concept for a sequencer, which also addressed the special needs of sampled percussion

The Beat

programming. Indeed, several A&R people who heard songs we'd recorded using the MPC asked who the drummers on the tracks were. (As I was trying to present the project as a band, I gave the names of the drummers who had programmed the MPCs — although, as we never got signed, perhaps it wasn't that much of a compliment after all!)

The concept of combining MIDI sequencing and sampled percussion was originally enshrined

I'd found the supply of them so scarce that I had already started to look around for a substitute; if this unit could also use looped samples then it might be the one for me — and £200 extra is not a lot to pay for a 16-bit looping sampler section inside a sequencer.

I trust you will forgive the impetuousness of your humble reviewer if I pursue this line (instead of the conventional 'this is what the box looks like', 'how you make a sample' and so on), but I

Goes On

AKAI MPC2000 DIGITAL PERCUSSION SAMPLER/SEQUENCER

in the Linn 9000 some 12 years ago, and some might suggest that it was this product — or its high price tag — that put Linn Electronics out of business. Those of you who were out of short trousers in 1985 may remember a somewhat scathing Linn 9000 review of mine, from which the phrase "dinosaur extinct before its release" became a particular thorn in the side of Kevin Kent, whose job at Linn was to sell them. My principal complaint about the 9000, apart from the fact that it would only hold four very short samples, was that there was no looping ability, which meant that the short playback time couldn't be extended for cymbals and other longer percussion sounds.

This 'percussion doesn't need looping' stance was maintained on the three Akai MPC units that carried Roger's name, the MPC60, MPC60 MkII and MPC3000. In fairness to those units, I should say that they did have much longer sample times than the 9000, and these could also be further expanded in the case of the later models. What's more, my two percussive colleagues swear that they don't miss the looping capability, not even in these days of ubiquitous sampled drum loops — which you should always re-trigger via a new sequence note every time they loop, because that way you stay in sync with everything else. But I always favoured the approach to percussion looping of the Studio 440 from Sequential Circuits (who also went out of business, so obviously it's not a company-saving feature), just because it allowed you to go beyond straightforward percussion sounds and cover more musical sounds (apologies to any drummers left out there!). Ever since I sold my Studio 440 almost 10 years ago, I've been waiting for someone else to do looping on a percussion sampler/sequencer.

LOOPING THE LOOP

So imagine my joy when, as I was leafing through the MPC2000 manual, a Looping screen caught my eye. Yes, folks: it slices, it dices... it loops! Suddenly my interest went from academic to personal. Having been considering purchasing a QY700 for live use after reviewing it last October,

feel that I may not be be alone in having been put off previous MPCs by their lack of looping. A little more detective work in the manual — the list of expansion options, to be precise — reveals that it has many things in common with Akai's S2000 sampler, and it therefore seems that the MPC has inherited its looping ability from its sampler cousin rather than from any dormant MPC gene. You might argue that this could be deduced from the shared numbering, but the similarities are much greater than between the S3000 sampler and its MPC numbersake. Not only does it use all SIMMs for memory expansion up to 32Mb (as opposed to the MPC3000's half-and-half approach of one 8Mb Akai board plus one SIMM), but it also has back-panel slots for the IB-M208P board (eight outs plus SPDIF) and the IB-M20T SMPTE board, and, internally, slots for the FMX008M Flash ROM and EB16 DSP effects boards — so, all in all, it's perhaps not surprising that, like the S2000, it loops as well! Nevertheless, this is still a major innovation for the MPC and I for one intend to celebrate it.

What's more, although the loop can be set to the start and end points of the sample — which would be useful if you were dealing with sampled drum loops — it doesn't have to be. The sample can actually be set to loop from the middle to avoid a repeated attack transient, and then to play to the end once the triggering pad or MIDI note has been released. Through velocity interaction with volume and filter envelopes, much more complex sounds can be created than have been possible on any previous MPC.

As a result, the MPC2000 can make much more sense out of the majority of S1000 and S3000 samples than its predecessors, which could load them but then only play them back as one-shots (see the sidebar 'MPC/S 3000/1000 Disk Compatibility'). However, the MPC envelopes remain fairly primitive, as they are still designed primarily for percussion sounds, with just attack and decay values and the ability to decide whether the decay starts immediately after the attack finishes, or in time for the end of the sample (or when the key or pad is released, if the sample is ▶

Akai MPC2000

looped). But this is still just about enough for standard envelopes such as piano, strings and brass, which have not been possible on an MPC before. It won't replace a general-purpose sampler for all sounds, but it dramatically increases the range of tasks the MPC can be used for. The only little annoyance this looping facility brings out is that parameters such as filter frequency are still not updated until you re-trigger the sound (when you couldn't loop sounds you never really noticed this, as you had to keep re-triggering anyway!).

Of course, the way that sounds are assigned to pads or MIDI note numbers means that there's no way to trigger a sample at different pitches via different incoming MIDI note numbers from an attached keyboard; each sample can only be associated with one MIDI note number — so grand pianos or sweeping string sections are ruled out anyway. The main advantages of the looping are that cymbals need not take up so much

> ## "It seems that the MPC has inherited its looping ability from its sampler cousin rather than from any dormant MPC gene."

memory and that you can cycle drum loops if you want to. And talking of drum loops (smarmy DJ-style link)...

LOOP TEMPO SYNC'ING

Another great looping-related feature I discovered when leafing through the manual (sometimes it really pays to get that tome out and at least skip-read it) was the MPC2000's Beat Loop Function. This, I suspect, comes courtesy of another strain of Akai sampler, the Remix 16. What this function allows you to do is to match the tempos of unrelated loops. You set the length of the drum loop in beats and it instantly tells you what the tempo is. Then, as you tune the loop up or down, the New Tempo readout tells you what you are changing the tempo to. This means that you can take half a dozen loops and use them together by adjusting their tempos to be the same in this page. Of course, the pitches of the loops are changed by this tune process (no miracles with time stretch yet!), but if you take loops of roughly similar tempi, their sound shouldn't suffer too much. Things only get really strange when you start changing the pitch sounds over a fifth — which is more than half as fast again, or slow — but then some people really like what drastic re-tunings do to a sound.

I'd never seen anything like this feature on a hardware sampler before (although numerous software-based products have similar features).

It's accessed via the Open Window button, a new facility on the MPC2000 which helps to make up for the fact that the backlit LCD is a lot smaller than on previous MPCs. Basically, the way it works is that whenever you are in an area (filter or envelope, say) on the screen and you think that there aren't enough parameters, you click on the Open Window button and a set of extra parameters appears in a new window — just as on a WIMP computer. It pays to know the function of this button, as it gives access to more than half the parameters available on the unit, so if you didn't know about it, you might think the MPC2000 a lot less programmable than it actually is. Another good reason to be a sad person like me and read manuals in the wee small hours when you are suffering from insomnia!

COSMETICS

Now I've told about my favourite new features on the MPC2000, I suppose we'd better get back to the boring stuff. Lazy bounders like me will be pleased to know that the unit weighs considerably less than its predecessors (isn't circuit integration a wonderful thing?) and is considerably more compact in size. The reduction in the number of buttons has been compensated for by the addition of a Shift key — which makes the numeric key-pad also available for selecting the various modes — and the Open Window button mentioned above. As the numeric buttons are already performing two functions, the Akai engineers have relieved them of the task of naming things as well; this now becomes a sub-function of the pads. It feels a little strange for AB to be at the bottom and YZ at the top, but this is nowhere near as confusing as when the transport functions used to double as letter keys on the older MPC machines.

Akai MPC2000

▶ The pads are still laid out in a 4x4 configuration (does this make MPCs off-road vehicles?) but they have now moved to the right-hand side of the machine. I tried to work out whether this favoured left- or right-handed people but came to no real conclusions, so let's call this an alternative arrangement. The only people I think it will affect are those who can program MPC3000s in their sleep, but they have plenty of other new stuff to throw them anyway, so I doubt this will add to their troubles unduly.

The MPC2000's back panel is somewhat lighter on connections. Some of these are only temporary absences, with the holes for the eight parallel output/SPDIF connectors and SMPTE sockets ready and waiting. Others are permanent, such as the MIDI Ins and Outs, which are limited to two on this unit — the same as on the Yamaha QY700, which is at a similar price point. While this is obviously a cost-cutting feature (and we haven't really discussed yet how much cheaper than its predecessors the MPC2000 is), it is a real shame that there's no expansion option to increase the number of MIDI Outs. Still, as the MPC3000 is not being discontinued, it will, I suppose, need something to justify its considerably higher price tag — just over double the RRP. Whether people will still continue to pay the price for it when they can't get the digital I/O, DSP effects or Flash ROM, remains to be seen.

ON THE SEQUENCING SIDE

Here things are virtually identical to previous MPC units — just a few buttons moved around and re-assigned — probably because those who have followed this method of sequencing would not accept any changes to their basic working method. On the Main screen you still assign a track to either DRUM or MIDI (sequencing internal or external sounds respectively) and to one of 32 MIDI channel numbers which are in the format 10A or 6B. Because there are only two MIDI Ins and Outs, the other 32 channels via C and D, which the MPC3000 had, are gone.

Tracks can be edited note by note in a Step Edit screen which looks just like the List Editor in most software packages, except that only four events can be viewed at once because of the small screen. However, the View parameter means that you can make the most of these four events by excluding or selecting just Notes, Pitch Bend, and other controller information, Channel or Poly Pressure, Tempo Change or System Exclusive Events. If you are used to editing in this way, it's just like any other comparable system in terms of speed and accuracy. A handy Play Soft Key allows you to check any event as you are editing it.

The Edit screen's name is a little misleading, as this is where you copy bars or events rather than changing the actual events (although this may be what some people understand by editing). Some rather clever icons help with this copying business, so it's less easy to make a fatal error when you're moving phrases around.

DISK MATTERS

Similar icons are used to show what type of disk you're loading from — 2D, HD floppies and Hard Disk, Magneto-Optical or CD-ROM SCSI drives — and where you are sending the data (to a cute little MPC2000 icon or the ubiquitous trash can). A Type field identifies the source disk, as in MPC2000, MPC3000, S3000 or S1000, MS-DOS or unknown ('????') format. For comments on the success of loading these different formats, see the sidebar on disk compatibility. The same

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MPC/S 3000/1000 DISK COMPATIBILITY

To try to evaluate just how useful the MPC2000 would be to anyone with an existing MPC3000 or S-series library, I am indebted to two friends, James Asher and Martyn Phillips, who put their libraries and studios (and in James' case, his stopwatch as well) at my disposal to check compatibility.

Beginning with some of James' MPC3000 banks on Syquest, we did comparative loads. A bank that took 25 seconds to load on the MPC3000 that created it took a leisurely 2 minutes 12 seconds to load into the MPC2000 — presumably due to the need to convert the data into a different format. However, when we tried the same experiment from floppy, a bank that had taken 1 minute 2 seconds to load into the MPC3000 loaded into the MPC2000 in just 44 seconds. "Curiouser and curiouser," said Alice. So either the basic Syquest format must be different or the floppy drive in the 2000 is much faster; either way, anyone changing to the MPC2000 will want to re-save their SCSI banks to speed up loading times (which in itself could be a mammoth task if there's a lot of data), but if they have everything on floppy then they'll be laughing.

Comparing the actual sound of the two machines, we found that there really wasn't any discernible difference, but on checking the sequence side of things, we discovered that, although the individual MPC3000 sequences had loaded into the MPC2000, the Songs were empty. I contacted Akai UK about this and they tried to get an answer from Japan but we were right up against the editorial deadline. I'm fairly sure this is a minor bug and you would still be able to reconstruct the structure of your Song, but MPC3000 owners who are looking to replace their machines with 2000s might do well to wait until this is sorted out. The date on the software supplied with the review unit is 24 December 1996, so it's clear what happened: they didn't get a chance to do the song data interpreter before the Christmas party started! The New Year software release should have trickled through by the time you read this, and should be able to pick up the Song data as well as the Sequence data.

Of course, this problem will only affect the few people who have recorded Songs on the 3000 which they would like to play back on the 2000. The majority of MPC2000 purchasers will just want to know that they can access all the MPC3000's library sounds, which is definitely possible. Those with a propensity for the sound of glorious 12-bit may want to use MPC60 sounds, so we gave that a try. "Divide by Zero Error!" was the glorious error message we received when trying to load sounds from MPC60 disks (if you divide things by zero, doesn't that give you infinity? [Yup. Sub-Ed.]). However, Graham at Akai tells me that this is not due to be supported until the next software release, so it's not surprising that we couldn't get those sounds to load, although it did recognise files on the disk.

I had a lot more success round at Martyn's with S1000 and S3000 sounds. Not only did they all load fine from floppy, but the loops all loaded as well, making a lot more sense out of pitched instrument samples. Our SCSI loads were less successful, as the MPC2000's SCSI ID cannot be changed from 6 and we didn't have a terminator to try it on its own (time was running out) — but these are standard SCSI problems and not exclusive to the MPC. It would be nice to have a way to change the MPC's SCSI ID, though.

Overall, I am fairly confident that Akai will soon have the 90% compatibility that's there extended to the full 100%. It's only the inordinately long SCSI load times for MPC3000 data that might continue to cause a problem, and might necessitate re-saving the entire library in MPC2000 format. But it is possible that even this can be speeded up — and floppy disk users will be saving time.

View field as in the Step Edit page allows you to single out the type of file you want to load, so you don't have to scroll through unwanted file types. Loading sounds in the MPC2000 format was very quick from both floppy and SCSI devices; once the sound is loaded you can listen to it, then assign it to a pad/MIDI note number or delete it. Loading was so fast that this was almost as good as the 'audition from disk' feature that some samplers now have.

CONCLUSION

Overall, the sound of the MPC2000 is excellent, belying its new cheaper price tag in exactly the same way as the S2000 does. Clearly, these days sound quality is not a function of price as it was a few years back: cost savings are now made in terms of inputs/outputs and other options, and most of these can be added slowly as the user's needs increase — and many of them, such as Flash ROM and DSP effects, will be making their appearance for the first time ever on a sampling drum machine/sequencer when

> "Much more complex sounds can be created than have been possible on any previous MPC."

the software upgrade which supports them becomes available. The nice thing about this is that someone with only £1199 to spend is no longer penalised for that by getting stuck with a machine that will never get any better — indeed, the only people who may feel a little peeved are the MPC3000 owners who can't get all these splendid upgrades.
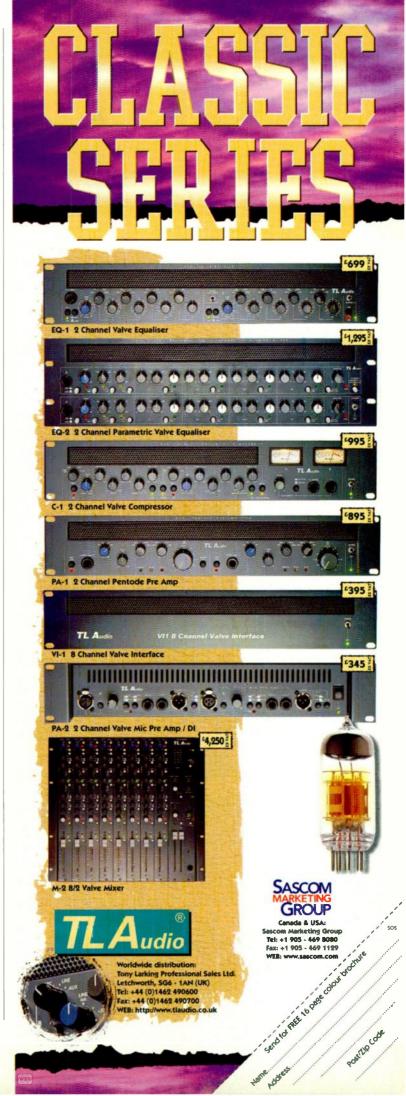
I dislike machines that rely on floppy disk operating systems on principle (would you want your brain to be carried around in a vulnerable external form?) but the MPC2000's can be copied onto a SCSI hard drive for booting, so this isn't too much of a problem. Maybe when the Flash ROM support comes it will possible to store the operating system in that, which would be the best of all possible worlds. Until then, SCSI drive seems the best bet; and, of course, you can use it for sound and sequence storage as well, especially if you end up expanding the memory to any great extent.

The size of display is perhaps the S2000's only serious disadvantage, but it never really left me feeling uninformed, mainly because of the clever View options and the Open Window button which, once I had discovered its function, always brought a pleasant surprise to the screen in terms of extra parameters to play with.

Whether the additional sample parameters are enough for my needs I have yet to decide, but this MPC is definitely more my sort of thing than the previous ones, not least because of its price point and upgrade options — a real advance on an established formula.

SOS

info

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Upwardly Mobile

ROLAND JV2080 SYNTH MODULE

Roland's JV1080 was a great success with serious synthesists, and recognising that if it ain't broke there's no need to fix it, Roland have provided more of the same with the new 2080. DEREK JOHNSON's spoilt for choice...

With the synth world becoming ever more focused on instruments that provide DSP-based simulations of ancient analogue synths — a strange case of cutting-edge technology looking backwards rather than to the future — it's easy to forget that creative synthesis is not necessarily the sole domain of those original instruments, or their modern, hi-tech simulated counterparts. Sample-based digital synths, the introduction of which in the mid-'80s virtually killed off the knob-laden analogue synth as a commercially viable mass-market product, are still very much with us, for good or ill. The downside of this accessible technology is a dependence on short, static looped snapshots of sound — the raw samples. So much hinges on how well-recorded they are, how many multi-samples make up an individual 'waveform', whether the loops are obvious, and so on. The upside is epitomised by cost-effectiveness: who, apart from the extremely rich or the intrepidly home-brew, would have dreamed of having 16 different synths, complete with multi-effects, in the late '70s or early '80s? Yet this is precisely what the average multitimbral sample + synthesis instrument offers today, often at a very low price indeed. A fine example of what is possible with today's technology is Roland's new JV2080, which is the focus of this review.

THE OLD & THE NEW

Essentially, the JV2080 is very similar to its predecessor, the still-current JV1080 (reviewed in *SOS* December 1994). Features common to both 2U modules include 64-voice polyphony, 16-part multitimbrality, 448-waveform ROM, three sets of stereo outs, General MIDI compatibility, and the ability to add Roland's SR-JV80-series sound expansion cards. The sound architecture is built around a collection of four-element Patches (the more elements per Patch, the less available polyphony), and 16-part Performances, which can either offer full multitimbral operation, layers and/or key/velocity splits of various Patches on one MIDI channel, or a mixture of both.

And so to the enhancements: most visible is the redesigned front panel, which now sports a large, friendly liquid crystal display (the JV1080 manages with a 2-line, 40-character display), an array of helpful 'soft keys' under the LCD, and redeployed buttons. These physical changes are echoed in an operating system which has been streamlined in several ways. Not only is editing made much easier by the large display, but Patches are more accessible using the new 'Patch Search' facility — you select Patches using a computer-like hierarchy. Auditioning Patches (press the volume control) is also more fun, with the option of using chords or phrases as well as individual notes. You can even change the font of the display's

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pros & cons

ROLAND JV2080 £1399

pros
- Three insert effects in Performances.
- Excellent new display and operating system enhancements make editing a breeze.
- Ability to host an amazing *eight* sound expansion boards.

cons
- Still only 16-part multitimbral.
- Manual a bit scatty.
- Quite similar to the JV1080, which is still current.

summary
Whether you go for the sub-£1000 JV1080 or the sub-£1500 JV2080, with its additional effects and superb display, depends on your requirements. Those extra features are *very* tempting...

SOUND ON SOUND

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text. One excellent feature of recent Roland synths has been the ability to expand your instrument by simply slotting in optional voice expansion cards: the JV1080 accommodates four, while the JV2080 can take eight.

Other areas where the JV2080 improves on the JV1080 include number of Patches (the 2080 has 768 to the 1080's 640, including 128 User Patches), drum kits (12 up from 10, with two user kits) and effects. The basic reverb and chorus 'system' effects are joined by no less than three 'insertion' multi-effects (called EFX by Roland) in Performance mode (the JV1080 has just one insert effect). This means that, apart from the main system effects, there are three extra effect units, chosen from a collection of 40 effect types, that can be used independently in a Performance. Note that Patches can only use a single EFX in addition to chorus and reverb.

Performances remain static at 64 preset and 32 user, and the JV2080 actually loses something: there is no PCM card slot, which the JV1080 uses to expand its waveform allocation. A data card slot, for storing more Patches, Performances and drum kits, remains in place. Oh, and Roland haven't called the JV2080 a Super JV, either, as they did with the 1080.

WHAT IT'S GOT

As just mentioned, the front panel has been significantly redesigned. The huge display and array of six function keys make accessing parameters and editing Patches and Performances much easier. The large parameter value knob and cursor buttons are in the middle of the front panel, and the remaining buttons, which are spread around the panel of the JV1080, are arranged tidily to the right of the 2080's panel. The first row of buttons selects an operating mode (Performance, Patch, Rhythm or System), the next includes the three effects on/off switches, and the last two rows are used to select and enable Elements within Patches and Parts within Performances.

A headphone socket is at the front, along with a master volume control; all other connections are at the rear. As you may have already noted, these are identical to the JV1080: a main stereo out is joined by two sets of fully assignable 'direct' stereo outs, and the usual trio of MIDI sockets.

Not surprisingly, the JV2080's architecture has a lot in common with that of the JV1080 — in fact, Patches and Performances from the JV1080 and the similarly-specified XP50/80 synths are completely compatible with the JV2080. Up to four basic elements — called Tones — make up a Patch, and these Tones can be arranged in a variety of 'Structures', which configure the Tones and filters in some rather interesting ways, either independently or with some interaction; several Structures also include ring modulation and a 'booster'. This latter parameter introduces a form of distortion or pulse wave modulation, which is further enhanced by the use of each Element's 'Wave Gain' parameter plus FXM (frequency cross modulation).

Each Element in a Patch is also treated by its own TVA (Time Variant Amplifier, a sophisticated envelope generator), TVF (Time Variant Filter, with resonance and its own envelope), two highly comprehensive LFOs (with no fewer than eight waveforms, including sample & hold and chaos) and Pitch EG. Interestingly, individual Tones can also be delayed, or triggered on a key-up. Effects — chorus, reverb and EFX — are also available as part of a Patch. Although there can only be one EFX per Patch, not all Tones have to be routed through it

A separate mode is used to edit drum kits. Any waveform can be selected for each 'drum', and a range of tuning, envelope, filter and effects options are also available — individual pitch bend is assignable to each sound in a kit. Note that drum kits are usually on MIDI channel 10, so set your controller to that channel when playing sounds during editing.

So far, so good: use the key range and velocity crossfade options cleverly, and you can make a single Patch sound like a full band — almost. For real knuckle-cracking layers of sound, try a Performance. Here you can layer or key split up to 15 Patches on one MIDI channel (Part 10 is drums, remember), or have 16-part multitimbrality. As mentioned earlier, in Performance mode you can access not just the global reverb and chorus effects, but up to three insert effects. This means that three parts can have

JV2080 FEATURES

- 64-note polyphony.
- 16-part multitimbrality.
- 768 patches, including GM patches and 128 User Patches.
- Three effects systems: reverb, chorus and multi-effects (EFX).
- 320 x 80-dot LCD.
- Three sets of stereo outputs.
- Eight wave expansion board slots.
- Data card slot, for M512E memory card.

ROLAND JV2080

► drastically different dedicated effects. Routing options also allow for a Performance's various Parts to be routed to any of the three stereo output pairs, with or without effects; use hard panning and no effects and you have individual outs.

As was noted in *SOS*'s JV1080 review, Roland's latest generation of S+S technology offers an excellent source of raw sound, pretty nifty filters and fast-acting envelope generators under the control of a powerful central processor. You can create slowly evolving sounds, and set up sluggish envelopes, but if you need a tightly clipped sound, the JV2080 won't let you down. Zipper noise and quantisation artifacts? Not here, mate!

The effects are superb, as one would expect from Roland. Extracting them from the JV2080 would produce a good stand-alone processor. One nice thing about the delays (amongst the EFX effects) is that when you use the maximum feedback value, the delays repeat for ages, but don't degrade and get distorted (unless you've overloaded the input). Instead, they build up to a really dense level, and then fade slowly to nothing.

EASE OF USE

I can't stress enough how helpful the new large display is; it makes moving around the operating system and editing Patches and Performances a rather agreeable affair. Total newcomers may find it a bit confusing, but just keep your eye on the menu bar, at the bottom of the display. This will usually tell you what you need to know. If you're unsure as to where you are or what you've done, hit the Exit button, to the right of the LCD, or press 'Undo', which will get rid of your last edit.

Such ease of use is especially welcome given that the main user manual is not the most helpful that Roland have produced. Beginners will welcome the smaller quick-start manual, but expect a little head-scratching when it comes to extracting the big issues from the main manual.

CONCLUSION

Don't get me wrong: the JV2080 is a fabulous synth, with power, depth, subtlety and sophistication in reserve for the adventurous sound mangler, a hefty number of excellent presets and friendly operating system for the slightly more timid, and amazing expandability. The provision of three floating insert effects in Performance mode is also highly gratifying — doubly so when coupled with the ability to route dry or EFX-treated parts to the two pairs of direct outs (although how nice it would have been to use more than one EFX per Part!).

But the spec offered by the popular JV1080 isn't *that* inferior, and the 1080 cost £350 less than the 2080 does on its release just about two years ago; the disparity is even greater now that the older synth has been "re-positioned" at £999. Whether a bigger display, two extra insert effects, some extra sounds, a tweaked operating system, and the open invitation to spend more money on expansion boards (£2000 to fill all eight slots!) is worth the extra cash is up to you. Facilities that would have been really welcome — double the multitimbrality, more user Patch memories and perhaps more audio outputs — have not been provided. Let's take an example from elsewhere in Roland's range: the SC88 Super Sound Canvas GM module was released at around the same time as the JV1080, for £799. The SC88 Pro, reviewed last month, retails for the same price, yet offers a significant number of sonic and hardware enhancements over the original. However, Roland report a initial sell-out on JV2080s, so the customer must be making up his or her own mind.

Reservations aside, the JV2080 is one of the best examples of a high-class sample + synthesis-based module on the market at the moment. It sounds great, editing has been made highly accessible, and the effects provision is particularly generous. If you only want one MIDI sound module, could this be the one? **SOS**

BRUCE
RECORDING INXS'S *ELEGANTLY WASTED*
FAIRBAIRN

Musician and producer Bruce Fairbairn is best known for his US rock smash successes with Bon Jovi and Aerosmith, but blended live band recording and a willingness to use studio technology to record the latest INXS album, Elegantly Wasted. RICHARD BUSKIN finds out how he did it.

Bruce Fairbairn's track record includes artists such as Bon Jovi, Aerosmith, AC/DC, Poison, the Scorpions, Blue Oyster Cult, Van Halen and Chicago; as a producer, he derives much of his in-studio enjoyment from the process of capturing not only the sound but also the natural energy of a live band performance on tape.

"Being a musician myself, I have a good ear for songs, for arrangements and for music," he says, " so I try to bring all of that to a project, providing songwriters and musicians with a sounding-board on which to base their material and their performances."

Fairbairn's ability to inspire and draw the very best performances out of artists is another major plus.

"I think that reflects my experience over the years, being part of a band," he explains. "That's how I learned to play, and so that's why I'm really not that interested in working with bands that don't — or can't — perform live. For me that's all part and parcel of giving the consumer a product that is true. I really have a problem with records where the end result doesn't represent either the human performance of the artist or any ability on the part of the artist to actually perform that song. I think that's musical fraud, so I stay well away from it."

ROOTS
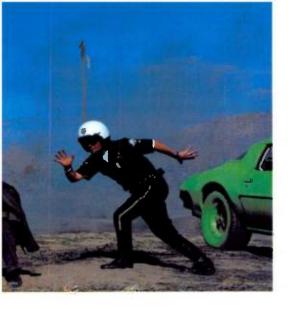
Born and raised in Canada, Fairbairn began playing the trumpet at the age of five, before making his pro debut with a high-school band at a local church. Later there were spells with groups such as the Spectres and Sunshyne, and just before Sunshyne split up they recorded a demo of drummer Jim

Vallance's compositions. Bruce Fairbairn went off to get a degree in Urban Planning at the University of British Columbia, the demo tape arrived in the hands of an LA producer, and when said producer contacted Fairbairn and told him that he liked what he had heard, Fairbairn pretended that the band was still together. A deal was signed, and Sunshyne metamorphosed into Prism.

Jim Vallance is now best known for his songwriting collaborations with Bryan Adams, yet together he and Fairbairn produced the first Prism album, which was a hit in Canada. Four more albums followed, with Bruce playing in the horn section — but when Mick Jones, Foreigner, and Rick Ocasek of the Cars called on his talents as a producer, Fairbairn stepped over to the other side of the console. He went on to produce Loverboy's first two albums, which sold more than eight million copies in Canada and the US, and Bon Jovi's *Slippery When Wet*, which sold over 13 million worldwide. Bruce's ability to commit great performance to tape was then confirmed when Aerosmith's *Get A Grip* debuted at Number One on the American Billboard charts — a first for the band in its 20-year history.

INITIAL XS

A man of many musical talents, Bruce Fairbairn is undeniably one of the hottest producers of the '90s. Among his most recent projects is *Elegantly Wasted*, the new album by — and his first collaboration with — Australian group INXS, and it was while he was spending a rare few hours away from the studio that I was able to talk with him about the sessions.

What was your initial involvement with the INXS project?

"Well, I was contacted by PolyGram in London. The boys had put together some demos and were looking at getting going. So I flew over to London and spent a couple of afternoons with Michael [Hutchence] and Andrew [Ferris], and we talked about where they were with the writing and where they wanted to go with the record.

"They'd rented a tiny little studio in Dublin for a week or so and done some writing there, then they'd done some other writing in London, and they had nine or ten songs that were reasonably well advanced. Actually, they sent a few of the demos to me before I flew over to London and they sounded pretty good — a lot of keyboard stuff, a lot of guitar stuff that Andrew had overdubbed, and vocals. I was impressed with the feel and the different sounds that they'd been using. They hadn't laboured over them

but they'd stumbled on some really good things. For instance, some of the guitar sounds were really weird; composites of maybe two or three different tracks had been laid down without any thought about how they would go together or what they would be doing, but, once put in context, they appeared in different sections of the song quite nicely.
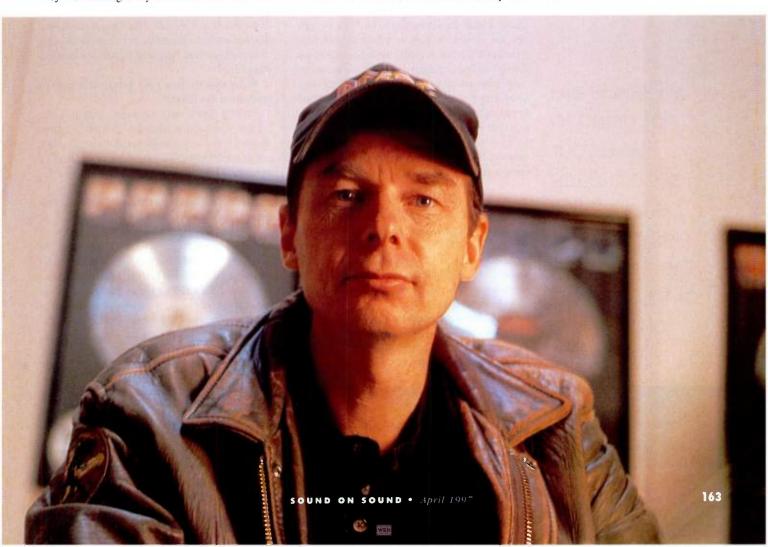
" I was quite impressed, and I actually ended up suggesting that we might want to save some of the stuff on the demos — because the chances were that when we were back in the studio we wouldn't be able to recreate that vibe. Andrew's very meticulous in his musical work, and my thinking was that, given the time to reassess some of the parts that he'd already played, he would probably change them and they might well suffer as a result. That was especially so with some of the vocals: Michael, after a few glasses of wine, wanted to sing and I really captured some good energy there. I'm always a believer in hanging onto those small gifts."

What were the demos recorded on?

"On a variety of formats: some were on 24-track reels, some were on ADAT, and what we ended up doing was loading everything onto a Sony 3348 and then calling those our 'working masters'. For some of the songs, we brought those tapes out to Vancouver, did a lot of reorganising of what was on there, threw some stuff out, laid down new drum and bass parts, and then recorded vocal overdubs or made up new composites incorporating some of the more interesting aspects of Michael's original performances."

What was the direction that Andrew and Michael were looking for?

"Well, they had just finished a record, *Welcome To Wherever You Are*, which had been very well ▶

"People are not going to take your record back because the kick drum at the beginning of the second chorus is a little late."

received critically — by the press and by their closest fans — but which really hadn't been able to achieve much success commercially. So what they wanted to do was make a good band record that was more commercially accessible while still as high in quality as the previous album. That was the dilemma — trying to get the best of both worlds.

"When I suggested that we use the demos as the basis for what we were going to be doing over the next few months, the guys were quite pleased. Then it became a question of getting the band involved and getting band performances down. We also cut several songs from scratch, so there was a nice balance there. Overall, however, they wanted to get the band back in the public eye with a vengeance and a passion, and to do that we were really going to look hard for good songs — especially some singles that would fly at radio — but also make a record that would have some depth of character and integrity in the songs."

STUDIO SETUP

Where did you work on the album?

"We did the bulk of it here [in Vancouver] at my studio, which is called the Armoury, then we adjourned to Spain for a couple of weeks and worked at a small studio near Marbella, before returning to Vancouver and then mixing at the Townhouse in London."

What is the setup at the Armoury?

"We've got a Sony 3348 as well as a couple of Studer A800s, a 72-channel G-Plus SSL console with automation, UREI 813A and Yamaha NS10

monitors, a fair amount of vintage gear... The Armoury is not really based on that gear, but there's enough interesting stuff that we rarely have to go outside to bring in any equipment.

"There's just one main recording area — a nice, big, cathedral-like area with a wood floor — and three isolation rooms around it. So there's lots of room for the band to congregate and to set up live."

Several tracks had already been composed, but when the sessions proper got under way, were some songs also being written in the studio?

"By and large no, although a couple of very interesting songs came on-stream in Spain, one of which — 'Everything I Do' — is on the album."

How many tracks are on the finished record?

"There are 11 tracks, 12 in Europe, where the extra track is 'Shine', and 13 in Japan, where the other song is 'Ride'. Strictly a marketing ploy, providing incentive to discourage imports."

Did INXS play as a band in the studio?

"Yes, they rehearsed and then some tracks were cut as a band, while for others the boys came in and overdubbed to the existing demos. So it really was a combination of both."

And were any outside musicians brought in?

"Not much. We used Luis Conte, a very talented percussionist who I know from California, and some friends of mine called the Margharita Horns, and then we had a couple of girls come in and sing some backgrounds. Basically, though, the band did everything."

What exactly was your production role in relation to the band?

"Well, I didn't really co-produce with the band, but the record was produced with Andrew Ferris. Andrew was certainly a player at the demo stage, and as we ended up keeping some of the stuff on the demos I felt that it was fair to recognise his contribution in some way."

Mike Plotnikoff was the engineer on this record. How do you interact with him?

"I'm not really technically inclined, you know; I'm aware of what's going on, but I'm not inclined to spend a lot of time worrying about the technical aspects of the session, so I rely on Mike to make that a no-brainer for me. That allows me to concentrate on what is going on with the music, the dynamics of the performances and the musical aspects of the record. I mean, I don't question him that much about what mic he wants to put up for Michael Hutchence to sing into. As long as it sounds good ▶

to my ear, I'm happy to go along with what he wants. We work pretty much hand in glove getting sounds up; basically I just put my ear to it as the bottom line, along with whoever is playing the part, but I let Mike pretty much run his show."
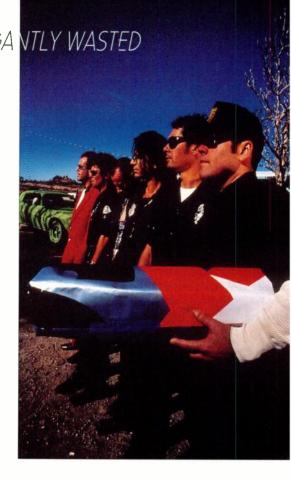
GETTING IT TOGETHER

What were the moments when things really came together during these sessions?

"Well, one of the things that I was most excited about was when John [Ferris] came to play drums on top of some of the existing tracks. He's an uncanny drummer in that he's able to lock in with an existing track — you know, cut to a click — and he's deadly. It was almost unnatural, the way that he was able to play on those tracks and make them feel good. When most drummers play to a click or to an existing instrumental track they will rush or slow down, but John has this amazing ability to be in there and on the mark consistently, as well as to add a really good feel. So I was just so happy when he came in and laid his parts down on some of these songs.

"Another thing that I really enjoyed about the sessions was that Andrew [Ferris] doesn't tend to choose what I would call mainstream sounds to work with. He's always exploring and trying different things, and he's a fountain of ideas. You know, I would go in there and say, 'Gee, the second verse could really use something to give it a bit of a lift', and within the space of about five minutes Andrew would have three or four different possibilities on the go. He'd say, 'Well, listen to this. What do you think?' and he'd have this great counter-melody, and then he'd say, 'Well, what about this?' and there'd be something else. It was really an inspiration to work with that kind of input as a producer. I didn't have to sit around humming and hawing for a couple of hours, waiting for him to find a part. If anything there were too many on the table, and I think that one of our biggest challenges was to take these songs and make them work with just the essential ingredients. Of course, when you have 48 tracks available there can be a tendency to fill them up just in case, but I'm very against carrying the excess baggage along and so house-cleaning was always a big thing for us.

"Still, Andrew was really excellent at coming up with good ideas, and of course as a singer Michael shoots straight from the hip. His vocals are just full of weird things that he can do. For example, we were in Spain where we did a lot of the vocals, and the vocal booth window of this studio looks right out over this big cliff towards North Africa. Every afternoon there was a warm wind coming across from Africa, and on one day it was really strong and it started whistling through the window. Michael was singing and he paused, and all of a sudden this wind made a really loud whistling noise and Michael just jumped right on it and sang along with it, using this wind almost as an instrument as it came through the glass! At the end we all looked around and said, 'What was that?' Then we said, 'Okay, let's hold it. Let's wait a minute. This wind is going to come again and we'll record it again, so

we've got another one.' Of course it never came again, but Michael, God bless him, was there!
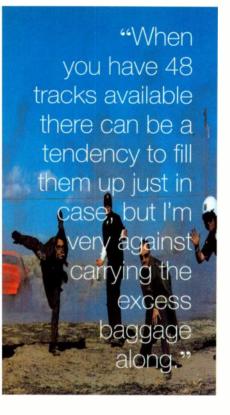
"I'd come down into the studio at three in the morning and there would be Michael in his pyjamas jamming on a vocal. He was always down there stirring the pot and working on new ideas for himself. I think he was very happy with this record, because for once it wasn't a situation where the last thing to be done was the singer writing the lyrics — you know, the singer's in there grasping at straws, trying to get anything that makes sense so that the record can be completed. Basically, Michael had 90 per cent of his lyrics completed before I got involved, and for him it was really a good experience because all he was dealing with now was performing and revising lyrics. He didn't have to try to generate completely new ideas. He'd already gotten that down, and I think it gave him the luxury of really concentrating on his performances without being pressured to go down to the wire."

XS SUCCESS

Although you knew the direction that the band wanted to go in, this was your first project with them: did you have a fresh perspective that led you to also pull them in a direction conforming to your own vision?

"Not really. My philosophy is more that it's the band's record, and so you try to hammer out a mutually shared vision before you start the project. Because I'm not sure that I really want to do that record if we're not all pulling in the same direction — it's going to result in problems down the road. But, to their credit, the guys were very consistently in line with our original discussions.

"You know, there's no magic really about deciding what you're going to do with a record. They ▶

> "When you have 48 tracks available there can be a tendency to fill them up just in case, but I'm very against carrying the excess baggage along."

WRH

▶ wanted a record that was going to be a commercial success but they didn't want to do a bullshit pop record, so to me that was fairly clear. Then, on another level, they really wanted to experiment with different sounds, although they didn't want to redraw the playing field in terms of recording. They weren't out to make a real audiophile kind of record, taking

"Michael's got a great voice, and he could make a little clip-on mic on your jacket sound like a million bucks."

a year to break new ground in the recording business. Instead they wanted to go with energy and performance over nitpicky advancements in sound quality; what was going to make the songs work, concentrating on the material and the performances, not spending two weeks getting a drum sound together or three days choosing the right mic for Michael to sing into. That took three minutes. He's got a great voice, and he could make a little clip-on mic on your jacket sound like a million bucks.

"Our general attitude was that there were bigger fish to be fried than making a record that people would remember as the best technical achievement of the year. Let's make a record that will have people going around singing the songs afterwards and saying, 'Man, this is a great INXS record!'

"Once you get those kinds of principles out on the table and everybody's headed towards them, it's fairly easy to keep your direction. So at no

time did I feel that I was pulling the band away from that. My job was really to make sure that they stuck with the original premise, and that we didn't see any of the guys starting to go sideways or run around in circles over a particular part. If a part's not working, let's go onto something else and find something that does work, rather than spend days and days trying to sort it out.

"Some people are inclined to say, 'Let's load the drums onto the computer and we'll get everything just perfect. The feel will be 100 per cent.' Then, three days later, they're still dicking around with a kick drum here and a snare drum there, trying to make it work, and in the process they've screwed up 50 per cent of the parts that were already on the track. My counsel in a situation like that would be, 'Look, that isn't important. What is important is if the song works. People are not going to take your record back because the kick drum at the beginning of the second chorus is a little late. If they do, I'll pay for it!'"

When you're making a record like this, what market are you aiming at? The States? Europe? These days it's not always easy knowing what's going to get major airplay on the radio.

"That's right. If you start making a record for radio you'll be chasing your tail, because by the time it comes out things will probably have changed anyway. So between the guys in the band, their manager, myself and the people at Mercury, we were trying to find a record that has some songs that we think are going to be really radio-friendly — although not in all formats, of course: it's impossible to go urban, AOR and Top 40 all at once. By and large, however, instead of things being specifically written for a certain market, we just picked the best songs that were available, and then we sat back and said, 'Okay, do we have something that Top 40 radio can play here?'"

And then once you've got enough singles you feel able to indulge yourself more on the other material...

"Right. My feeling is that if you've got three or four songs on your record that radio can get their teeth into, then the balance of the album is more a musical expression of where the band is at, and the songs that they want to play, and the songs that they want to play live. That's the time that you really set the direction.

"There are some songs on this record whose arrangements are very interesting from the instrumental perspective: different kinds of instruments and different textures that radio doesn't even get close to, yet they still play a really important role. However, at the end of the day, if we sat and looked at our songs and there were no obvious hits on that record, we would still be in the studio."

DUB OR LIVE

Are INXS comfortable playing as a band in the studio or do they prefer overdubbing?

"They really do both quite well. They've spent so many years playing live they can jump in and

THE RECORDING SETUP

John Ferris' drum kit was set up in the main room at the Armoury with everything isolated, and a combination of 24 microphones which engineer Mike Plotnikoff wishes to keep close to his chest. "It's kind of my personal setup," he says. "Let's just say that the microphones that I choose to use and their placement give a different sound, and I apply that to the kits of most rock drummers who I work with."

Gary Beers played bass, and this was recorded with both DI (direct injection) and a couple of mics in a bass-trap box; Tim Ferris' guitars went through a Marshall amp miked with a Shure SM57 and a Sennheiser 421. Michael Hutchence's vocals were captured via a valve Neumann U67.

"He used that mic on the demos," explains Plotnikoff. "As a lot of the demo vocals were retained, we had to use that same mic to match the sound for his other performances, but it's not a mic I normally use. It's a good-sounding microphone, but I've just got used to others."

Andrew Ferris' keyboard rig included a Fender Rhodes, a Roland Super Jupiter, two Akai S1000 samplers and Roland's JV1080 synth module.

Although most of the album was recorded

digitally, three tracks utilised a Studer A800 analogue machine for the drums, bass and guitar: 'Girl On Fire', 'Thrown Together' and 'Bang The Drum'. On the tracks 'Show Me' and 'Don't Lose Your Head' the drums were recorded with only three microphones, and in this case Plotnikoff is willing to divulge names and placement.

"John [Ferris] had purchased a really old drum kit and it sounded great," he recalls. "It had one kick drum, one snare drum, a tom, a floor tom, one cymbal and a hi-hat, and he was able to get something like a John Bonham sound out of it. For those songs, we therefore decided to just use three Neumann U47s in the room, with compression, and everybody just loved the sound. With the lack of control and isolation, you couldn't do that for every song, but in those cases it turned out really well." Incidentally, the first half of 'Don't Lose Your Head' actually features a drum machine.

Mike Plotnikoff was not involved at the mix stage, but he ensured that everything was already prepared for Tom Lord Alge.

"I did a mix for him beforehand in Vancouver so that he had a guideline as to roughly what we wanted," says Plotnikoff. "All he had to do was push up the faders and he was ready to go."

sound great at a moment's notice. At the same time, with the way that the technology has developed so quickly over the last two or three years, they've made a point of overdubbing as well. So they're quite comfortable working with drum loops, they're quite comfortable coming in and overdubbing onto existing tracks, and they fit into those situations in a very positive way.

"They all have their own keyboard setups, samplers, sequencers and stuff, and so when they're home they write their own songs, play around with them and experiment with them. Then, when they come together they all carry that body of knowledge and nobody's out of the loop, and I think that is unusual for bands."

How about those magic live moments which are captured on tape but which the band fear they'll never be able to reproduce on stage? Do you give a lot of thought to that?

"Sure. In fact, what Andrew does is offload everything that we put on tape, and as we speak now he is sitting there writing sequences for their tour. All of the important bits and pieces — you know, little effects and overdubs that he played on keyboard — he will be able to trigger live on stage, and I think that's a legitimate thing. He played them in the studio on his keyboards but he just doesn't have enough fingers to play them all at once."

What about Michael's vocals? Were they comped much?

"I wouldn't say 'much'. He's a very spontaneous kind of performer, so I tend to try and retain his performance in as much of one piece as is possible. That isn't to say that I don't do some comps with him, of course, but I would always try to base it on one main performance and then just move in those little parts where he nailed it better on another take. Basically, he's a performer, and a lot of the magic in his vocals comes from one-off stuff that he happened to be doing on a particular day." **SOS**

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Cubase Score 3.0 - £ 499.00 inc vat

Beware of imitations.

STOP PRESS

Steinberg have announced that Cubase VST for PC will be released at the end of August. The program will be identical to the Mac version and include realtime EQ and effects. The upgrade will be free if you purchase a Cubase program after 1st of March 1997.

ReCycle! 1.6

This program makes the task of matching the tempo of one audio file with that of another EASY. Recycle isolates an audio file's rhythmic components, allocates the sample to different keys on your sampler and saves them as notes in a midi-file. When the midi-file is played, the audio-file will sync perfectly, whatever the tempo. Once you have tried it, you won't be able to live without it. Version 1.6 is compatible with Akai, E-mu, Kurzweil, Ensoniq, Roland and Digidesign samplers. ReCycle! 1.6 - £199.00 inc vat

...groove analysis...

Minimum system requirements: Any Windows MME compatible MIDI interface. 486 DX/50 or better recommended. 8MB RAM and VGA Monitor. Windows 3.1, Windows for workgroups or Windows 95

ENSONIQ

ENSONIQ DP PRO PROFESSIONAL EFFECTS PROCESSOR

BOOM

Ensoniq seem determined to break into the big-league effects market with their highly specified 24-bit DP Pro. PAUL WHITE investigates.

Ensoniq's DP/4 effects unit surprised a lot of people with its clarity and finesse, but now the company have come up with a 1U 24-bit effects unit that's very obviously targeted at the potential Lexicon PCM80 or TC Electronic M2000 Wizard purchaser. Even the format of the machine is very familiar — there's a choice of analogue-only inputs and outputs or a digital I/O option, up to two simultaneous effects (or hybrid effects combinations) with a choice of series and parallel routing options, a database search engine for finding effects by type or application, and real-time MIDI parameter control. The analogue audio path goes via 20-bit converters to give a 100dB dynamic range, though the digital I/O option can provide interfacing with up to 24-bit word length.

As supplied, this sleek 1U machine has three banks of patches — two empty user banks of 128 patches each, and one factory preset bank of 128 patches. A further bank contains templates for the six signal-routing options used to combine the effects algorithms; this contains just six patches, which can be copied to any location. Each of the two powerful on-board processors can run any one of 38 effects algorithms at a time (some of which create two simultaneous effects),

so the DP Pro is more than a one-at-a-time effects machine, but it isn't designed to provide loads of effects running at the same time.

In addition to studio effects, the unit can handle certain types of dynamic processing, such as compression, gating and de-essing, as well as stereo synthesis and stereo image manipulation. Especially worthy of note is the inclusion of a Mastering Limiter — another shot across TC's bows? This incorporates a lookahead system with elaborate peak detection to ensure no overshoot, but with the minimum of side effects. It also acts as a level maximiser, levelling out changes in amplitude between successive songs on an album. With the digital I/O fitted, this would be a very useful adjunct to a digital editing workstation.

USER INTERFACE

The first thing I want to do when I get hold of a new effects machine is to try out a few of the factory patches so I can get an idea of what kind of things the box can do, and how well it does them. In this case, the patches are arranged into banks of 128 in typical MIDI fashion. You select a new bank by either pressing the Select button to step around the available banks, or using the data wheel to scroll through the patches in the current

bank and then the next one. Patches are loaded using the Enter button, though MIDI Bank and Program Change commands are also accepted. Disconcertingly, though, once a patch has been loaded, the display continues to flash, which I find off-putting. (Apparently the logic for this is than anything in the window that can be changed using the data wheel will flash, and, in the case of patches, you can always use the wheel to select a new patch — hence the flashing.) If you simply want to cruise the presets, this is about all you need to know.

The review model came with blanking plates covering the digital I/O section socket cutouts — the digital interfacing (S/PDIF and AES/EBU), comes as an option rather than as standard. The analogue configuration is 2-channel in, 2-channel out, with combined jack/XLR connectors for the inputs and separate jacks and XLRs for the outputs. Both sets of connections are balanced, and a rear-panel switch chooses between +4dBu and -10dBV operation. Both the inputs and outputs are converted at 20 bits with 128 times oversampling. The full set of MIDI In, Out and Thru connectors is fitted, along with a jack labelled Foot Switch 1&2. Mains power comes in via an IEC lead, and there's no external voltage selector.

The front-panel layout is nicely uncluttered, with an almost total absence of dual-function buttons. A rotary level control and stereo LED VU meters look after the input levels and the Meter Function switch swaps between input and output level monitoring. Three LEDs show the selected sample rate — the 48kHz LED was illuminated on this unit, but to me it would make more sense if all the sample rate LEDs stayed off until the digital option was fitted. Two more LEDs detect digital in and MIDI In activity, and a four-digit numeric readout shows both the currently selected bank and patch number. A 24 x 2 character LCD window shows the type of effect, its routing and the patch name; in the edit modes, this window is used to provide parameter information. Data entry is via a single rotary encoder, and 20 buttons with integral status LEDs handle the rest.

Inside the DP Pro are two Ensoniq ESP2 VLSI signal processing chips, referred to in the manual as ESP A and ESP B. There's also a 16MHz, 16-bit host processor to look after housekeeping. Each of the ESP chips can run one of a selection of effects algorithms, most of which provide either a single effect or a process, though there are a few dual-effect configurations. When you're creating a new effects patch, there are six possible routing options for the two effects processors, two series (one with overall feedback), two parallel, dual mono (mono out) and dual mono (combined stereo mix out).

EFFECT CREATION

To create a new effect, it's probably easiest to edit one of the factory patches, but if you want to start from scratch, the order in which to work is first to choose a routing option, then decide which algorithms to load into the ESP A and B processors. In fact this procedure is mimicked by the edit button layout, which starts with the routing button, then forks into A and B paths with buttons for Algorithm, Parameter, Mod and bypass. Once you've chosen your algorithms, there's the usual menu of user-variable parameters which you can step through by pressing the Parameter button to call up the required parameter group (Tweak, Mixer and Algorithm parameters), then using the Previous and Next buttons to navigate through them. Value changes are made using the data wheel, and finished edits can be stored in any user location.

Up to four parameters may be modulated in real time via MIDI, external footswitches, two internal LFOs or the data entry knob's 'Tweak function', for both ESP A and B, and either processor can be bypassed if you only need to use one of them. Modulation parameters may be set so that the modulating source adds to or subtracts from the set parameter or, if you prefer, the set parameter can be overridden completely, leaving the mod source in full control.

Tweak is a neat feature that borrows from Lexicon's Soft Row concept, but works rather differently. When you're setting up the effects parameters, you can also designate up to eight parameters per ESP for quick access, so that instead of having to get into full Edit mode to change something, you simply keep pressing the Tweak button until the parameter you want to change comes up, then use the data entry knob to change it. The Tweak menu can contain as many or as few parameters as you like, up to the maximum of eight per ESP.

Delay- or LFO-related effects can also be set up using the front-panel Tap Tempo button, or they can be synchronised to external MIDI Clock so that effects-timing parameters can respond to tempo changes in the material being effected. ▶

THE EFFECTS

The sidebar 'Effects Algorithms' should give you some idea of what the unit is capable of, though it's interesting to note that, as well as the more obvious effects, there's a Tunable speaker option that could be useful for creating post-pro 'futz' sounds, such as transistor radios and TV sets. There's also Chatter box — no in-depth explanation is provided in the early version of the manual, but this seems to involve modulated formant filtering, which lends the effected sounds a slight vocal or 'chattery' quality.

The reverb algorithms supplied here are smooth, polished and versatile; in addition to the more obvious reverb parameters, there are several individually adjustable delays and a number of associated diffusion parameters. All the usual reverb types are available, including early reflections and small rooms, though there are two separate ambience algorithms and one 'Reflection Modeler' for adding space to a sound without clouding it with reverb.

Pitch shifting provides up to three voices per channel, with delay and filtered feedback. These may be controlled via MIDI or set manually, and there are multi-voice detuning treatments. The detuning, rotary speaker and chorus options are very flexible, and compare favourably with other very serious effects processors. As usual, sounds shifted up or down by any significant amount take on a shimmery modulation, but, to be fair, the quality of shifting available here stands comparison with the shifting used in just about any multi-effects processor, many of which are more costly than this one.

Also worthy of special mention is the Spatial Delay, a kind of multi-tapped echo that seems to come from everywhere. The multitap delay algorithm can have up to 32 individual delay taps, with filtering and diffusion, and the compressor is as good as any I've tried on an all-digital box.

ENSONIQ DP PRO

► Each ESP includes parameters for adjusting both input and output level as well as the left/right balance of the incoming signal and the wet/dry level. Algorithms may also be copied or moved from one ESP chip to the other.

USING THE DP PRO

Using the machine was slightly complicated by the fact that this early version of the manual doesn't include full descriptions of all the algorithm parameters, but it describes the operating system very clearly, and a revised manual is due imminently. In fact, the operating system is one of the best I've come across and, once you've figured out what some of the less obvious parameters do, programming and editing are a doddle. The individual ESP bypass buttons make it easy to turn off one effect while you're working on the other, the edit buttons proceed in a perfectly logical order, which matches the way you'd normally work, and the result of any parameter change is heard almost immediately. However, changing patches takes quite a long time — around a second, at a guess — which suggests that some of the algorithms are very sophisticated and processor-intensive.

As supplied, the unit is set up for a stereo input and there's no normalising function to let the DP Pro know that only one jack is plugged in. For this reason, if you want to run with a single mono input, you have to let the software in on your intentions. Once you've got this far, it's all pretty simple — the combination of the Search system and the Tweak parameters makes it easy to find a suitable type of effect, then, in most cases, you can quickly customise it using the Tweak options rather than having to get involved with editing. If you do have cause to get into more serious editing, the process is both logical and painless, though the menus for some of the more involved algorithms' parameters are quite extensive.

Obviously, when you're paying the best part of a kilo-quid for an effects box, you expect it to be just a little bit special. Though the DP Pro doesn't have too many wild tricks that can't be duplicated using competing products, the effects you do get are supremely good, both technically and artistically. The reverbs in particular have a well-integrated quality about them, and while they might sound fairly ordinary in isolation, they work very well in the context of a mix. The decays are smooth and quiet, the reflections conveying the character of the type of room you're trying to emulate, and there's plenty of parameter adjustment for customising your own rooms, including the usual decay time, pre-echoes, diffusion, frequency tailoring, damping and so forth.

Chorus effects are two a penny — any old effects box has a whole bank of the things — but, again, not all chori are born equal. In the DP Pro you can throw together a more obvious guitar chorus with the added richness of multi-tapped algorithms, but when you combine the effect with multi-voice pitch detuning, then work on the parameters, results can range all the way from a rotary speaker to an ensemble effect so subtle that

> "Obviously, when you're paying the best part of a kilo-quad for an effects box, you expect it to be just a little bit special."

you don't know it's there until you turn it off. The Symphony preset provides a clean and creditable alternative to Yamaha's famous Symphonic chorus, and there are other versions not dissimilar to Roland's extremely collectable Dimension D.

Being able to combine the two effects blocks in several different series and parallel ways provides a simple way of getting more variety, but it also enables the DP Pro to be used as a true dual-effects processor with two mono inputs and a combined stereo output. Here each channel runs its own algorithm, so, unlike some multifunction effects units which offer limited dual-input operation, the DP Pro has no restriction over what effect can be placed on each channel. It's also possible to run each channel as a mono in, mono out effect. Unfortunately, with any unit like

EFFECTS ALGORITHMS

There are 39 effects algorithms available:

00 No effects	07 De-Esser	18 Small Ambience	29 Rotary Speaker
01 Mastering Limiter	08 Stereo Synthesizer	19 Small Ambience 2	30 Tunable Speaker
02 Compressor limiter	09 Stereo Re-imager	20 Non-Lin Reverb	31 Parametric EQ
03 Compressor	10 Variable Tap Delay	21 Non-Lin Reverb 2	32 Octave EQ
04 Expander	11 Spatial Delays	22 Multi-Pitch Shift	33 Delay+Chorus
05 Stereo Gate	12 Ping-Pong Delay	23 Multi-Chorus	34 Delay+Flanger
06 Dual Mono Gate	13 Stereo Delay	24 Flanger	35 Delay+Phaser
	14 Loop Recorder	25 Phaser	36 Distortion+Chorus
	15 Expert Reverb	26 Tremolo	37 Distortion+Flanger
	16 Expert Reverb 2	27 Panner	38 Distortion+Phaser
	17 Reflection Modeler	28 Chatter Box	39 Signal Generator

this, you could make a career out of exploring the creative potential of the algorithms, and in the time available for a review, there's not much to spare for experimentation. Even so, it's quite obvious that this processor has an enormous amount of creative potential — and, thanks to the friendly operating system, getting results doesn't take as long as you might think.

SUMMARY

From my time using it, it's pretty obvious that the DP Pro is a good machine to have on your side, but how does it differ from the competition — in fact, what is the competition? Obvious contenders are the more expensive Lexicon PCM80 and TC Electronic's M2000 Wizard, and though the lower-priced Lexicon MPX1 is more of an overt multi-effects unit, I guess it still shares the same arena. Come to think of it, the Alesis Q2 is also a very serious multi-effects unit — a fact that many people have still not come to fully appreciate. Though the DP Pro is cheaper than both its main competitors, it doesn't have the advantage of an expansion card slot for adding more algorithms, additional effects storage or third-party patches. However, Ensoniq tell me that there will be future user-installable OS EPROM upgrades which will add new algorithms and additional banks of

factory presets. In addition, software will become available for a number of popular computer-based editor/librarian programs, including Opcode *Galaxy* and Emagic *Sound Diver*, to provide further access to third-party presets.

The fact that the digital interface comes as an option, not as standard, is probably one reason that the DP Pro's basic price is so attractive; as the majority of people don't yet use digital interfacing on effects, this is one way of making a saving without cutting back on quality. Adding the mastering dynamics processing was also a clever move — with some companies' products, you have to buy one box for the effects and another for the mastering tools. The DP Pro's broad repertoire of serious studio effects, classy reverb algorithms, and friendly operating system make it a welcome addition to a relatively uncrowded section of the effects market. $\boxed{\text{SOS}}$

Analogue filter banks are not exactly a new concept, but this one combines an unusually flexible specification with MIDI control and an affordable price. CHRIS CARTER passes on some filter tips...

Filters — don't you just love 'em? Sharp, soft, bright, dark, they each have their admirers and their uses. The current retro renaissance shows no signs of slowing down, with all the major (and many minor) players rolling out 'new retro' products monthly. With a massive international dance music scene as the current vanguard of ever-more exotic filter sounds, it's not hard to see why manufacturers are keen to tap into this lucrative vein.

THE SHERMAN TANK

The Sherman Filterbank under review here consists of a lot more than the name implies and is actually quite a package of goodies. There's a preamp

Colour Factory

SHERMAN FILTERBANK

(with overdrive), two multi-mode VCFs (Voltage Controlled Filters) with selectable harmonics, an ADSR (Attack/Decay/Sustain/Release) and an AR generator, an Envelope Follower, an LFO (Low Frequency Oscillator) and two VCAs (Voltage Controlled Amplifiers). It is, in essence, a synth module without an oscillator.

If first impressions are anything to go by, this sturdy-looking, rackmountable steel unit, with colour-coded, rubberised knobs and bright, multi-coloured LEDs scores points as soon as you unpack it. It's also compact enough, at 17 x 4.5 x 3.2 (inches), to drop into a gig bag or holdall.

That sloping front panel hosts 25 knobs and switches for controlling the various filter functions and modes. The rear of the unit features 10 jack sockets, for audio and control connections, plus a MIDI In, Out and three MIDI Thru sockets.

At first glance, the profusion of knobs and LEDs can appear confusing, but spend a little while familiarising yourself with the layout and functions and things become clear. Working from left to right along the top row of controls, the first one we come to is a single audio input and level control. This input knob also acts as a sensitivity control for triggering the ADSR/Envelope Follower and the AR generator. The input can take almost anything you care to throw at it — sampler, drum machine, Bassline, synth or guitar. An Overdrive feature is introduced by turning the input knob past its centre detent, and this can be adjusted between soft harmonic and grungy industrial distortion. Achieving a balance between having enough level to trigger the ADSR/AR and adding too much Overdrive can be a little tricky, though.

Next along is the FM knob, which modulates the filter. The FM depth is fed internally by the

audio input, but if a second source (audio signal, CV/Gate or another LFO) is plugged into the external FM input, that can be used to modulate the filter instead.

The ADSR generator, next in line, is similar to the type found in most synths and is very versatile, handling short, long and inverted envelopes with ease. An LED indicates triggering, and a bi-colour LED indicates whether the Sustain signal is negative (red) or positive (yellow). A small switch toggles between ADSR and Envelope Follower modes. In Envelope Follower mode, the ADSR control signal follows the level of the audio signal rather than just being triggered by it, with most of the controls working as in ADSR mode and the bi-colour LED acting as a level indicator by turning red when the level is too low. The ADSR/Envelope Follower can also be triggered from a socket on the rear which will accept audio or Gate signals such as percussion samples, a Bassline Gate output, and so on. There's also an ADSR CV/Gate output socket for triggering external drum pads, sequencers and keyboards from the Filterbank.

The LFO has two control knobs, Speed and Depth, and produces a basic sine wave. The speed is indicated by a bi-coloured LED and is adjustable from an extreme one cycle per minute up to a rate of 3kHz. This extends well into the audio range and is great for making bubbly, ring modulator effects. The LFO depth control modulates the VCFs in anti-phase (great for stereo) and produces a positive waveform when turned to the right and negative to the left, with a centre indent for no output.

The AM input modulates the VCAs and is driven by the output of VCF2. The result of this is a type of modulation that also varies proportionally to the amount of VCF2 resonance. If an additional

source, audio or CV/Gate, is plugged into the external AM input, a kind of rhythmic distortion can be superimposed on the sound.

Next is the AR generator, which controls the VCAs. While not as versatile as the ADSR, this is capable of producing some very usable pulsing and gating effects. It is also triggered by the audio input but has an external trigger input socket that can accept audio and CV/Gate signals.

The last two knobs (before we move onto the filters) are the Parallel/Series and the Bypass/Effect controls. The first allows a variable mix of the filters in either parallel (2 x 12dB) or series (1 x 24dB), or a 50% mix of both modes. The variable Bypass/Effect control is a welcome change from the usual in/out switch and allows smooth changes between heavily filtered effects, through more subtle effects, to a completely straight sound.

FILTERED OR PLAIN?

The two VCFs are identical 12dB types, and each can function as a low-pass, high-pass or band-pass filter, with various combinations of all three modes also available. Each VCF has a control knob for Frequency, ADSR depth, Resonance, low-/band-/high-pass Balance, and Mode Correction. These last two controls need some explanation. It's pretty obvious what the Balance control does, but note that the filter mode is fully variable and not a switched type, so some nice tonal changes can be achieved by sweeping the knob back and forth. The Mode Correction control is marked -B (extreme left) to -B+LH (extreme right) and has a centre indent for ▶

THE MANUAL

Unfortunately the Filterbank manual is a disappointment. For a start, the title, *The Abusers Manual*, is a little suspect. But the real problem lies in the disorganised way it has been put together. There is no index and few meaningful specifications, but there *are* pages and pages of pretty pointless drawings of envelope shapes. The diagrams and examples verge on the absurd, with drawings of dogs, cats, mice and little men turning gears and lying in bed, used to explain complex concepts and techniques. However, a new, more technical manual should be available by the time you read this review.

WRH

Sherman Filterbank

AVAILABILITY

The Filterbank is the brainchild of one man, Herman Gillis, and he personally checks each model before they're dispatched. It's only being produced in fairly small numbers at the moment, so unfortunately you can't try one at your local music store. If you can, arrange a demo with the UK distributor: you won't be disappointed.

POWER POINTS

Power for the Filterbank is supplied by a continental, two-pin type AC PSU that needs an additional adaptor for UK 3-pin sockets. Unusually, the PSU has a non-standard 15V AC output, not the usual DC voltage used by most manufacturers. This is worrying, as replacement AC to AC adaptors are almost impossible to buy in your local branch of Tandy or Dixons. If I were gigging or on tour with the Filterbank I wouldn't relish losing the PSU and having to find a replacement in a hurry. Keep a spare, though, and you'll be covered.

no correction. Let me give you an example of its function: if you set the LP/BP/HP Balance control to band pass and turn the Correction control right, toward -B+LH, this configures the VCF as a notch filter and produces a subtle phasing effect. VCF1 has a separate audio output and some very extreme swirling stereo effects can be achieved by setting the filters to different modes, in parallel.

Unlike some other filters of this type, the Filterbank refuses to go into full self-oscillation. It tries, but only manages the mid/upper kHz range, so you can't produce the sub-bass sine waves that some VCFs can. But it does turn out some pretty good high-pitched sweeps and warbles, very techno (and 1950s sci-fi). Just be careful you don't blow your tweeters.

Common to both VCFs is the large Harmonics/Sync 12-way rotary switch, with blue on/off LED. Its first position is labelled 'Free' and allows both filters to run independently, while the subsequent positions are labelled with numbers. At setting 1, both filters are in sync and act as a single 24dB VCF. In this mode, the frequency knob and ADSR depth knob of VCF1 control both filters. Turning the switch to the next positions (1.5 to 16) introduces progressively lower harmonics until, at position 16, the harmonic content is four octaves lower than the original.

RETRO MIDI

MIDI is included as standard, and the designer of the Filterbank has expanded the unit's usefulness tenfold by doing this. Although MIDI is implemented here in a fairly basic fashion, it does open up all manner of automated control options to the user. MIDI-controllable functions include cutoff frequency and resonance (for each VCF), adjustable FM depth, VCA level (volume), AM depth, attack, decay, sustain and release times. MIDI can be used to trigger the ADSR and AR generators independently and the internal, audio input trigger can be turned on or off via MIDI. The Filterbank can also convert incoming audio and CV/Gate triggers to MIDI notes, from the external inputs of both the ADSR and the AR — a very useful feature indeed.

The only minus point is that the MIDI output only transmits MIDI trigger notes from the ADSR and AR, and nothing else — it doesn't transmit System Exclusive messages or Controller information. For *Cubase* users, a mixer map can be supplied on request, configured for the above MIDI Controllers. The current map is a little basic but does give an idea of the potential for using the Filterbank as part of a sophisticated MIDI system. Apparently, an updated version of the mixer map will be available from the Sherman web site soon.

PUNCHING AND KICKING

While this isn't the warmest analogue filter I've ever heard, it certainly has a lot of character. In the upper ranges, it has a pleasant 'grainy' sound, while in the middle ranges, particularly in band-pass mode and with resonance, it can cut through a mix like a knife. But it's down at the bottom end that things get really serious. The effect that the Harmonics switch and the Overdrive feature have on a sound can be extraordinary, particularly if a lot of bottom end has been filtered out by the VCF. A thin and lifeless rhythm or bass line can take on a whole new life, with added bass punch and kick. And the Filterbank shouldn't be restricted to processing electronic instruments exclusively. I tried feeding a guitar through the overdrive input while triggering the ADSR/VCF from a drum-machine snare and triggering the AR/VCA from a hi-hat pattern, with the LFO adding some modulation to the VCF. The phrase 'polyrhythmic acid funk' could sum up that sound. And, of course, with MIDI control you can achieve unbelievably complex filter sweeps, ADSR triggering and VCA modulations. The Filterbank works particularly well for breathing new life into samples, drum machines, digital synths, guitars, and even the ubiquitous TB303.

But beware! This unit could seriously damage your speakers, and there are dire warnings concerning low frequencies printed in the manual and on the Filterbank unit. If you're really worried about the potential for damage, though, you could use the unit through a compressor/limiter.

There were no noise specifications available for the review model Filterbank, but I found the audio quality to be clean and noise-free, even at extreme settings. However, I did notice a couple of idiosyncrasies: one was a slight, but not unpleasant, instability when the filters were at maximum resonance. Another was the tendency for the volume to disappear, or suddenly jump to maximum when sweeping the ADSR depth control — although this could have been to do with the nature of envelope generators, rather than anything wrong with the unit.

PANDORA'S BOX

What really sets the Sherman Filterbank apart from others in this crowded market is the additional combination of overdrive, harmonics, envelope generators, LFO, VCAs and MIDI control. While it is probably better suited to studio use than live work it will undoubtedly become required kit for many remixers, dance acts and producers (see 'Famous Names' box for some of the artists already using it). In this price range there is nothing quite like it, and whether you're into retro-sounding gear or not I can wholeheartedly recommend it. This is a hell of a processor. If a Moog is a Rolls Royce, the Sherman Filterbank has to be a Porsche. **SOS**

The Big Squeeze

COMPRESSORS & HOW TO USE THEM

These days a compressor is pretty much an essential purchase if you're recording vocals or non-keyboard instruments. PAUL WHITE looks at how they operate, and how they can be used both to control levels and to fatten sounds.
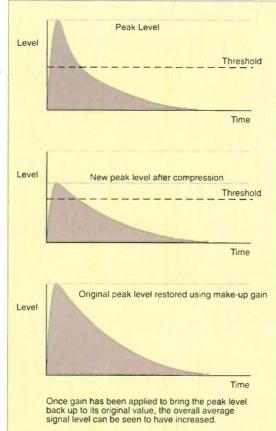
Figure 1: An uncompressed signal, a compressed signal, and the same compressed signal brought up to the same peak level as the original.

Peak Level — Level — Threshold — Time

New peak level after compression — Level — Threshold — Time

Original peak level restored using make-up gain — Level — Time

Once gain has been applied to bring the peak level back up to its original value, the overall average signal level can be seen to have increased.

T o the best of my knowledge, compressors were first developed as a means of keeping the levels of location movie sound under control, shortly after the industry decided that talking pictures had earning potential. They were soon adopted by the music recording industry as a means of keeping the vocal excesses of untrained pop singers under control, but along the way the benign side-effects of heavy compression became a production trademark. Indeed, compression is as much a part of modern music-making as digital reverb.

Though the use of compression is not always as well understood as it could be, the fundamental workings of these devices are pretty straightforward. Essentially, a compressor is a processor designed to reduce the dynamic range of an audio signal by applying gain reduction when the input exceeds a certain level. In other words, when the sound gets too loud, the compressor turns it down. In the context of pop music, this is a useful way of applying automatic level control to singers who may not be able to restrain themselves on louder notes. In addition, vocalists find some phrases and words easier to sing than others, and the outcome is usually a performance that fluctuates in level by a considerable margin from phrase to phrase — and even from word to word. You may have experienced this in your own demos made without compression, where some sung words and phrases tend to be obtrusive while others get almost completely lost beneath the backing — and, aside from the considerations of vocal intelligibility, unplanned changes in level make a recording uncomfortable to listen to. Furthermore, because pop music tends to have a fairly restricted dynamic range compared with, say, classical music, a degree of routine compression can make the vocal sit more comfortably at the correct level in a mix. Though vocals are the most obvious candidates for compression, most acoustic instruments work better in a pop context when their dynamic range is deliberately restricted. The same is true of electric guitars and basses.

One aspect of compression that causes confusion is whether it makes loud sounds quieter or quiet sounds louder. The mechanism of compression means that loud sounds are reduced in level, but most compressors have an output level control that allows any gain lost by compression to be restored or made up for. If you apply enough make-up gain to bring the signal peak levels back to where they were before compression, the quieter signals will be louder than before, so you can think of compression as both a way to make loud sounds quieter and to make quiet sounds louder. Figure 1 should help to explain this, as it shows an uncompressed signal, a compressed signal, then the same compressed signal brought up to the same peak level as the original. As quieter sounds can, in effect, be increased in level, compression has the effect of boosting the average signal level which, in turn, means that the average energy level is higher. This often results in a more powerful or punchy sound, even though the peak level is unchanged.

COMPRESSOR ACTION

A typical compressor comprises a gain control element, such as a VCA, and a photocell and diode ▶

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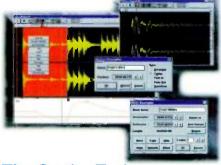
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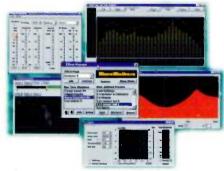
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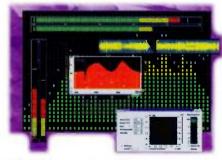
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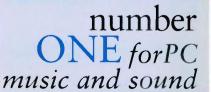
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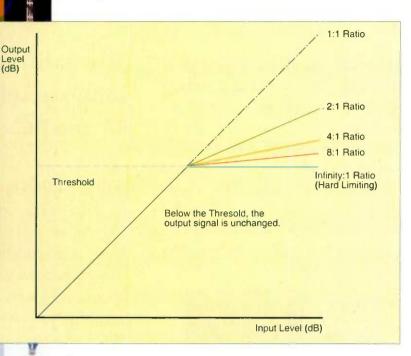
Figure 2: Compressor Threshold and Ratio.

Figure 3: Soft-knee compressor.

arrangement, or an FET gain cell in series with the input signal. A second part of the circuit, known as the side-chain, monitors the input signal to establish its loudness or level. The signal level is continually compared with a threshold set by the user, and when the signal reaches or exceeds the threshold, a control signal is sent to the gain element to reduce the level of the signal. Though this might sound a little complicated in engineering terms, it's almost the exact equivalent of listening to a recorded track over monitors and pulling the fader down when you feel it's getting too loud. Indeed, manually controlling levels in the way I've just described is known as gain riding, and a compressor is simply an automatic gain rider. The problem with doing the job manually is that, unless you've played the track through and memorised exactly where the loud

and quiet spots are, you'll always respond too late to changes in level, because you can't start to move the fader until you hear the start of the offending loud or quiet sound. Add to that the reaction time of a typical human being and you can see why you'll always be chasing the problem rather than curing it!

Before I explain how to set up a compressor, it probably makes sense to run through the various controls you're likely to encounter.

CONTROLS & TYPES

All the compressors I've ever used worked via a threshold system of one kind or another. With the simplest form of compressor, life is very black and white — if the signal is below the threshold set by the user, nothing happens to it, but as soon as it reaches the threshold, it is turned down by a specific amount. In the case of what's known as a 'hard-knee' compressor, the threshold level is well defined, but in a so-called 'soft-knee' compressor, the gain reduction is introduced more gradually.

• RATIO: The ratio control is very important, because in most compressors this determines the severity of the gain reduction to be applied once the signal reaches the threshold. The higher the ratio, the more gain reduction is applied and the stronger the compression effect. If the ratio is made high enough, the signal level can, in effect, be prevented from ever getting past the threshold, and this situation is known as limiting. Though a limiter requires a theoretical compression ratio of infinity:1, any ratio above around 10 is so close to true limiting that it is usually referred to as such. Because most compressors have enough ratio range to allow them to be used as limiters, they are often termed compressor/limiters.

Ratio is defined as the number of dB by which the input level needs to increase to cause a corresponding 1dB rise in output level. If, for example, a compression ratio of 5:1 is set, an input signal exceeding the threshold by 5dB will cause only a 1dB increase in output level, as shown in Figure 2.

• HARD KNEE: As touched upon earlier, a conventional compressor has no effect on signals that are below the threshold, but as soon as they reach the threshold, gain reduction is applied at the ratio set by the user. This is known as hard-knee or hard-ratio compression because the onset of compression is sudden and occurs as soon as the threshold level is reached.

• SOFT KNEE: Because hard-knee compressor can sometimes sound a little abrupt or heavy-handed, the soft-knee compressor was developed. With this type of compression, gain reduction starts a few dBs below the threshold, but at a very low ratio. As the signal gets close to the threshold, the ratio increases, until at the threshold the ratio is that set by the user. Usually the ratio increases over a range of 10dB or so before the threshold is reached. This type of compression isn't quite as positive as hard-knee compression, but in some applications it can sound smoother and more musical. Figure 3 shows ▶

Compressors & how to use them

▶ the characteristics of a soft-knee compressor.

Soft-knee compression is often used when the compression needs to be 'invisible', such as when you're keeping a mix level under control, whereas hard-knee compression is used in situations where it doesn't matter if you can hear the compressor working. Indeed, the audible side-effects of hard compression are often used as production devices to make vocals or specific instruments stand out in a mix.

TIME CONSTANTS

Earlier, I compared compression to the manual process of pulling a fader up and down. Just like the human engineer who does this, a compressor side-chain has a finite reaction time. It may be a lot faster than a human, but it's still true that a conventional compressor can't start to pull the signal level down until it has reached the threshold, and if that signal happens to be a snare drum with a near-instantaneous rise time, the compressor has to work incredibly fast to prevent the sound from shooting past the threshold level. In fact we don't always *want* to prevent the signal from overshooting as, in cases where brief peak overshoots aren't critical, the subjective result can actually be better than 'perfect' compression. For this reason, 'attack' and 'release' controls are provided to determine how quickly the gain is pulled down once the threshold is reached, and how long the gain takes to rise back to normal once the signal falls back below the threshold. Creating a deliberate overshoot by setting an attack time of several milliseconds is an effective way of emphasising the percussive nature of

drums. Too short a release time can result in level 'pumping', while if the release time is too long quieter sounds following a loud beat may be reduced in level even further.

Setting the best attack and release values for a given type of material can take a certain amount of skill and experience, and if the programme material is constantly changing in dynamics, no one setting is going to be quite right — which is why programme-dependent attack and release time were developed. An Auto function continually adapts the attack and release characteristics to the material being processed, by monitoring not only the input level but also the rise and fall times of signal peaks. Such systems can be very effective, especially on complex mixes or vocals.

If you were to set a very fast attack and a very fast release time, in addition to level pumping you might also end up with audible distortion, due to the fact that the compressor would be trying to work on individual cycles of the input signal rather than on its overall envelope. This phenomenon is particularly noticeable when the input signal is from a bass instrument, as the individual cycles are long enough to allow the compressor to respond. To get around the problem, it is necessary to increase either the compressor's release time or its hold time. Hold time is a short delay that prevents the compressor from going into its release cycle until a certain time has elapsed. All you need is a hold time longer than the wavelength of the lowest audio frequency and the problem is cured. Few compressors nowadays seem to include a variable hold control, but many have a fixed hold time built in, which ensures that the problem will never arise. If distortion does become audible at fast attack and release settings, and you don't have a hold control, you must increase the release time until the distortion stops.

SIDE-CHAIN SENSING

To continue comparing the compressor side-chain to the human hearing system... the compressor will always go by the average level of the sound rather than by the peak level, because the human ▶

DUCKERS

You may know that compressors with side-chain inputs can be used to make one signal control the gain of another — most of us are familiar with this technique through DJs using duckers to enable them to talk all the way through our favourite records. Personally, I prefer to use a gate with a ducking facility to create this effect, as I find it more predictable in operation and easier to set up, but you can use a compressor by feeding the signal you want to control into the main input, and the signal doing the controlling into the side-chain input. If, for example, music is fed into the main input and a DJ's voice is fed into the side-chain input, whenever the voice level exceeds the threshold, gain reduction occurs at the ratio set by the user. Figure 4 shows how ducking is achieved.
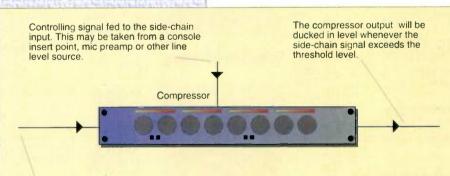
Ducking DJs (other than literally) isn't very inspiring, but you can use the effect quite creatively in a mixing situation by forcing parts of the backing track to drop in level to make a solo or vocal more audible. It's probably not a great idea to duck the whole backing track, but keyboard pad sounds or rhythm guitars could be usefully dropped in level by a dB or two for the sake of a clearer mix. If too much gain reduction is used, the gain pumping will become noticeable

— but many '60s hits pumped like mad, and they sounded great. Part of using effects is knowing how to make them sound good by abusing them creatively.

Ducking can also be used to control the level of effects such as delay or reverb — indeed, many effects units now include the facility to do this automatically.

Controlling signal fed to the side-chain input. This may be taken from a console insert point, mic preamp or other line level source.

The compressor output will be ducked in level whenever the side-chain signal exceeds the threshold level.

Compressor

Signal to be ducked is fed into the main compressor input.

If the input is in stereo, then the compressor must be switched to Stereo Link mode and both channels used.

The compressor Attack time determines how quickly the compressor will turn down the gain when the side-chain signal is present. The compressor Release time determines how long the level takes to rise back to normal once the controlling signal stops.

Figure 4: Using a compressor as a ducker.

Compressors & how to use them

hearing system tends to average out sounds in such a way that short, high-intensity peaks might actually sound less loud than a continuous sound at a lower level. That's one reason why the old-style VU level meter became so popular — the sloppy response offered by VU meters is pretty similar to the way we humans perceive sound levels.

For a compressor to respond to averaged signal levels, it needs what is known as RMS level-detection circuitry. Such a system will invariably let short peaks slip by, and though this doesn't matter so much in the case of analogue recordings (where brief level excesses translate to brief increases in distortion) there are situations, such as when recording digitally, where peaks need to be better controlled. For that reason, some compressors are fitted with peak level detectors, which respond to signal peaks, no matter how short. In addition to keeping a better check on peak levels, these compressors can work better on drum sounds, where average signal levels bear very little relationship to what the signal is actually doing. Some compressors use RMS sensing, some use peak sensing, and some use a system that is somewhere between the two. Others give you the option to switch between one type and the other. Always try both settings if you're lucky enough to have a compressor that offers both. As a general rule, peak detection works best with percussive sounds.

STEREO LINKING

When you're compressing stereo signals it's necessary to ensure that both channels are subjected to exactly the same amount of gain reduction, otherwise the stereo image will drift from side to side whenever the signal in one channel is louder than that in the other. For example, if a loud sound occurs only in the left channel, the left channel level will be pulled back,

and as a result the mix will appear to swing towards the right channel, where less gain reduction has been applied. The Stereo Link switch of a dual-channel compressor usually sums the side-chain inputs together, then controls both channels from the same side-chain. It may be necessary to set up both channel controls in the same way (the control settings are usually averaged, in this case), or you may find that one channel becomes inoperative and the other channel's controls affect both channels.

USING COMPRESSORS

A compressor should be patched into a mixer via an insert point, or connected in-line between one piece of equipment and another. Compressors should not normally be used with aux sends. It is common practice to add some compression to a signal while recording and then apply more at the mixing stage, should further control be necessary. This approach makes good use of the recording medium's dynamic range and, to some extent, protects against unexpected signal peaks. However, it's usually better to apply a conservative amount of compression during recording, which means you won't get as much protection against peaks as if you were hard limiting. Having said that, if you apply too much compression there's no easy way to undo it afterwards. Likewise, if the compressor has a built-in expander or gate, this might be better left switched off during recording, as a gate which has been set up badly can completely ruin an otherwise perfect take. Furthermore, if you save the gating until you mix, any noise inherent in the recording medium itself will also be gated out. If the gate settings are wrong, you simply reset the gate, then roll the recording again.

SIDE-EFFECTS

Perhaps the most common shortcoming of conventional compressors is the unwanted modulation of high-frequency sounds, due to large

DE-ESSING
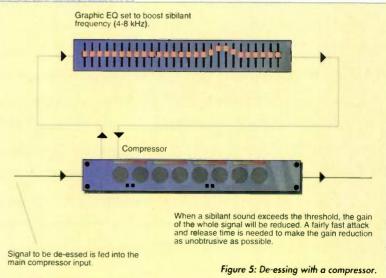
Some vocalists are more sibilant than others, and what starts off as a mildly irritating trait can become magnified out of all proportion by the time you've used your best capacitor mic, added a touch of 6kHz EQ boost for that extra sizzle, compressed the signal, and added a bright reverb. Fortunately, sibilance tends to occur in the 4-8kHz part of the spectrum, making it fairly easy to identify.

There are some units around which do an excellent job of reducing sibilance. These are known as de-essers, and the best ones act like compressors, but they only cut the section of the audio spectrum where sibilance occurs. However, it is quite possible to use a conventional compressor as a de-esser, providing it has a side-chain input and you have a spare equaliser. If the equaliser is patched into the side-chain signal path of a compressor, and set so that sibilant sounds are emphasised, the result is a compressor that responds more vigorously to sibilant sounds than to ordinary vocal frequencies. For example, if the equaliser is set to give around 10dB of boost only to sibilant frequencies, compression of sibilant sounds will occur 10dB before it does in the rest of the spectrum. Figure 5 shows how a compressor and equaliser may be used for de-essing. The shortcoming of this simple approach is that when sibilance is detected the level of the whole vocal is dropped, not just the level of the sibilant part of the spectrum. For this reason, you need to set a fairly fast attack and release time for the compressor, and settle for only a moderate amount of improvement, otherwise the voice will sound 'lispy' every time the compressor operates.

Graphic EQ set to boost sibilant frequency (4-8 kHz).

Compressor

When a sibilant sound exceeds the threshold, the gain of the whole signal will be reduced. A fairly fast attack and release time is needed to make the gain reduction as unobtrusive as possible.

Signal to be de-essed is fed into the main compressor input.

Figure 5: De-essing with a compressor.

amounts of gain reduction brought on by high-intensity bass sounds. In most music, especially electrically assisted music, the majority of the sound energy emanates from the bass end of the spectrum, obvious examples being the kick drum, bass synth, and bass guitar. Any high-frequency sounds that occur at the same time as high-energy bass sounds will obviously be compressed along with the bass, and it's quite common to hear hi-hats and other bright sounds being pulled down unnecessarily. One way to get around this is to use a multi-band compressor that applies different amounts of gain reduction to different sections of the spectrum. In practice, though, these are costly and rarely sound natural. A more pragmatic solution is to set a slightly longer attack time, to allow the attack of the hi-hat, for example, to pass through the gain-control element before any gain reduction takes place. How successful this is depends very much on the design of the individual compressor and on how much gain reduction is being applied.

It's surprising how much the sound quality of different compressors differs depending on their design and on the type of gain-reduction elements used. Tube and FET compressors tend to introduce a little even harmonic distortion, which has the effect of brightening up the sound, whereas compressors based on photocells tend to sound quite gentle. Even VCA-based compressors can vary greatly — unsophisticated designs often dull the sound or appear to cloud the mid and high-end detail, whereas a really good VCA compressor can sound almost perfectly transparent. The main artistic differences tend to occur when the compressor is being driven hard, which is why certain models are valued for the effects they create rather than for their integrity.

SUMMARY

There are almost as many different compressor characters as there are compressors, but there are a few basic rules that can be applied to setting them up.

• LIMITING: If you want to use a compressor as a limiter, mainly to control excessive peaks, you need to set the threshold fairly high and use a high ratio. The signal will then be unprocessed most of the time, but when a peak does occur, it will be controlled very firmly. A fast attack and release time is best, though if the sound appears to pump you'll need to lengthen the release time until the pumping is acceptable.

• THICKENING: There are times when you want to use a compressor just to thicken up a sound, and in this instance it's probably fair to say that you want to bring up the level of low sounds. To do this, set a much lower ratio — perhaps as little as 2:1, or even less, but set the threshold quite low so that you still get between 6 and 12dB of gain reduction showing on the meters. A longer release time may give a smoother sound, but every sound is different, so let your ears decide.

• SETTING UP: Once you've decided whether you want to thicken or limit, setting up a compressor is quite easy and you don't really have to think about the threshold level much at all. Once you've set the ratio, adjust the threshold control so that around 6-12dB of gain reduction shows on peaks and you'll have a good starting point. You can then adjust for more gain reduction if you want audible pumping, or back off the threshold for less gain reduction if you want to be subtle. Always adjust the release time to be as short as possible without pumping — start out at between a quarter and a half of a second — and start with a fast attack. For percussive sounds, lengthen the attack while listening to the result — you should set it just long enough to give the sound a good transient kick, and to avoid obvious gain modulation of high-frequency sounds. Smoother sounds such as vocals can be dealt with using a faster attack setting or, better still, an auto setting if you have one. **SOS**

PAUL FARRER describes the trials and tribulations of writing the soundtrack to the big-screen movie version of Shakespeare's Macbeth.

s a young boy I used to be enthralled by the music I heard at our local cinema, and never ceased to marvel at the powers of the soundtrack writers who could make your heart race or bring a tear to your eye when you watched *Star Wars* or *ET*. I used to wonder how this band of mainly anonymous people managed to pack so much raw emotion into their music, and what it would actually be like to be given such a responsibility: writing a soundtrack to a big-screen movie seemed both a glamorous and a rewarding thing to do. Earlier this year, I had the chance to undertake just such a project, and this is an account of my experiences.

PROLOGUE

I was first approached by *Macbeth*'s executive producer back in August 1996; he knew my work quite well as I'd scored another movie of his earlier in the year — a film called *The Bruce*,

up until the day when the final cut is sent off and the cinematic print made. Music is generally one of the last stages of the film process and, in a project of this size and budget, when the deadlines are looming, the soundtrack writer is the first one to be encouraged to hurry up... please! The soundtrack writer's dilemma, then, is: do you get hold of the film as early as you can and write music to certain scenes which may then have to be drastically changed and edited to fit new pictures, or do you wait as long as possible, get the film later (but in a more finished state) and work like mad in order to deliver the score in time for the imminent deadline? In reality, it usually ends up being a bit of both.

This production was a historically accurate setting of the play, filmed entirely on location and with period costumes and battle scenes to match. It was felt that the score should be mainly orchestral, but it did need to capture the threatening aspect of the script. For those of you

toil and trouble?

WRITING THE SOUNDTRACK FOR SHAKESPEARE'S *MACBETH*

starring Oliver Reed and Brian Blessed — as well as writing the music to a series of programmes that he'd produced for American television. He told me about his new film project and how it was to be a full-screen adaptation of Shakespeare's *Macbeth* starring Jason Connery and Helen Baxendale. He was very excited about the location filming that they had just finished in Scotland over the summer, and told me that he expected the film to last about two hours.

We met to discuss the time scale and I soon realised that, much as I wanted to, I wouldn't be able to fit the film into my schedule, as it conflicted with a big album project that I'd already committed myself to. Reluctantly, I turned it down. Fast forward three months, and I found myself in another meeting with the film company. They had fallen a bit behind schedule with the editing of the film and had yet to commission a score; was I still interested? You bet I was — and five days before Christmas I sat down with the film's editor and director to view a rough cut of the film. At this stage we talked about musical styles, what emotions had to be expressed at which point, and what sort of instrumentation would be needed for each scene.

IS THIS A DEADLINE I SEE BEFORE ME?

In any project for which you need to write music for a specific set of images the timings are absolutely critical. One of the biggest problems in this respect is that a feature film (like many TV programmes) is much more fluid and flexible than you might have thought — the upshot being that the length, pace and style of a scene can be changed quite dramatically in the editing suite, almost right

Paul Farrer.

unfamiliar with the play. *Macbeth* revolves around the title character and his wife, who is hell-bent on gaining power at any cost, and the repercussions of their actions. It's a fiercely dark and sometimes savagely gruesome tale of murder, revenge and conspiracy — in other words, a soundtrack writer's dream. The time constraints and budget restrictions (ah, the joys of the British Film Industry!) meant that I had to work fast, and so a good deal of the writing and production would have to be programmed and performed using a contemporary MIDI studio, and not a real orchestra as I would have liked.

WHEN SHALL WE THREE MIDI AGAIN?

I had already made a start, thinking of tunes for certain themes, weeks before I received a video copy of the final cut, and I was constantly adapting and customising these tunes to fit to the pictures as they arrived. I did the bulk of the writing with Emagic's *Notator SL* for the Atari, not because I feel it's the best software package available but because I know the program inside out, and so could work very quickly without having my attention distracted from the job in hand. The Atari controlled the bank of samplers and sound modules I was using and the whole thing was slaved to the

video machine from an audio SMPTE code on one channel of the stereo VHS tape; the other track of audio contained rough mixes of the dialogue and some ideas for ambient effects.

Although a large part of the music was being sequenced on a computer and generated from samplers and sound modules, it was essential to have the main elements played by real instrumentalists. I felt that Macbeth and Lady Macbeth each needed a strong theme within the soundtrack that the listener could easily identify with the characters, and these would have to be independent of each other. Lady Macbeth's theme (reflecting her determined but ultimately flawed intentions) was written as a solemn cello solo with orchestral string backing. Macbeth is much more uncertain throughout the film and is constantly regretful of his actions; for his theme I chose the Gaelic bass flute to play the central melody, and this forms one of the central themes of the whole score. Other parts that were performed live included clarinet and flute solos, pan pipes, certain vocal effects, and odd bits of Scottish ▶

Helen Baxendale as Lady Macbeth.

Jason Connery in the title role.

▶ drumming. An Alesis ADAT XT system was used to record the live parts, slaved to the computer and video tape via JL Cooper's DataMaster unit.

Before any of the live sessions took place I had already worked out exactly what needed to be played and where, by sequencing guide tracks on the computer in time with the video. Printing these out as scores for the session musicians to follow

was done by transferring the song files to a PC running *Logic Audio*, which has much better printing facilities than *Notator*'s. This was a simple enough procedure, but there is a world of difference between what you play on a keyboard as a cello sound and what a cellist can actually perform and play comfortably. During the sessions I'd start by playing a video of the scene that we'd be working on, and explain roughly how it fitted into the context of the play. From there I'd play the musicians my guide tracks and show them the scores for the various parts.

I tend to think that, although you've written the tunes and know what sort of sound you're looking for, it's nearly always best to encourage your

session musicians to have as much playing freedom within those boundaries as possible. For instance, the cellist was automatically making decisions about fingering, vibrato, which strings sounded best, and where to put crescendos and diminuendos; I had given her *carte blanche* and she responded by stretching the boundaries of playing expression as much as the timings against the pictures would allow. I find that working in this way is rewarding for all concerned: the players feel more confident in the session knowing that they have the right to say if they think something doesn't quite work, and you as a producer learn a great deal about the ranges and capabilities of different instruments — and, most importantly, the soundtrack is all the richer for having extra creative input.

It was the same story in the bass flute sessions. As the session progressed and we created a good vibe in the studio, the flautist began suggesting harmony parts and odd trill sections that I (as a non-flute player) would never have thought of. This is one of the great joys of music production, when a multitude of ideas begin bouncing between performer and producer and you have the time and the capability to capture and record them all, selecting the best ones for the final mix. In my opinion, it's one of the most rewarding parts of the job.

SOUND AND FURY
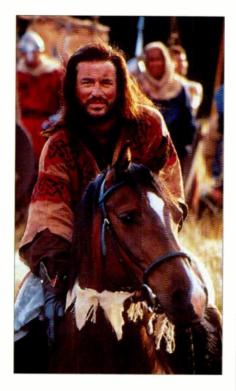
With the samplers providing a good bulk of the sounds for the project, it was important to create as many samples as I could from scratch. This was necessary not only to try and capture a traditional Scottish feel, but also to move away from the more 'polished' sheen that many sampled orchestral sounds have. Large sections of the film needed to have a music bed that wasn't always immediately noticeable, but gave you a subconscious feeling of dread or unease. To this end I spent quite a bit of time sampling various woodwind and vocal sound effects. Although they can take a bit of time to edit and set up, when pitch-shifted and used at more unusual sound ranges they can have a remarkable effect on a scene. In the famous scene of the three witches standing around a bubbling cauldron, in particular, it would have been very easy to slip into the clichéd trap of spooky high-pitched strings, but instead I found that more subtle low cello and bassoon lines mixed in with a few of these bizarre sampled effects gave the whole scene a much stronger other-worldly feel.

The majority of single orchestral sounds that I used came from either Roland's MOC1 module, which handles individual brass and woodwind sounds very well, or the orchestral upgrade I had fitted in my Emu Proteus 1 module some time ago. The two sample CDs that seemed to be of most help with orchestral string sounds were Peter Siedlaczek's *Orchestra* and *Orchestral Colours*. Both are releases that I would rate very highly for specific orchestral effects, but they also provide realistic string multisamples with a good bottom end to them.

SOUNDTRACK TRICKS

If you are writing music to fit a specific set of images, there are a number of points to consider. Firstly, what instrumentation will you be using? In the case of *Macbeth* all of the sounds needed to have an orchestral feel to them — so simply switching on the D50 and hitting a low C may work for certain things, but will probably sound out of place set against a medieval courtyard scene. Secondly, what is the overall tone of the piece you want to write? In what appears to be simply a sad scene, you'll very often find that quite optimistic themes are more effective as they add a certain irony to the emotions that the actors are portraying. Likewise, how busy does the music need to be? Somebody once said that if you notice a soundtrack to a film, it's not doing its job properly — some of the most effective film music is often the most simple (look at John William's world-famous two-note *Jaws* theme).

It's also vitally important that the music in a film enhances the actors' dialogue and doesn't crowd the voices out. A good example of this in *Macbeth* was during certain sections where the two central characters were having an argument about something. There was very little need for music to enhance many of these scenes, as the emotions of all concerned were so clearly expressed by the actors, but when the row was resolved and one or other of the characters broke into one of Shakespeare's many wonderful (but sometimes quite long) soliloquies, music could be a great help in establishing what mood the scene ended in, be it determination, anger, fear or whatever. It can also often help to think of a film's soundtrack as the emotional subtext to the screenplay. As a score-writer your job is often to push the emotional buttons of an audience, getting them to feel a certain way about a given character or situation. Try watching the scariest horror movie you can think of with the sound turned right down and see if it affects you even a tenth as much as it does with the sound up!

The main battle at the end of the film is a key scene, the climax of the whole movie: a cast and crew of seemingly thousands were used to film it. The soundtrack to this section had to be recorded and performed as a single piece lasting about nine minutes — and over that period of time there wasn't much dialogue, either, so the music had to compensate by giving the audience musical clues to how the battle was going. From the battle preparations, to the actual fighting, through to defeat or victory, the music has to keep the audience's interest at each stage, so it's vital not to lay all your musical cards on the table too early. This can be achieved in a number of ways using orchestral arrangement ideas such as key changes, complex instrumental solo lines, and all the levels of light and shade that you can coax from your sound sources. The session musicians helped a great deal in this respect: for certain sections of the final battle a form of almost frantic improvisation worked really well set against the images of rage and confusion on a mass scale. Although the multitrack tapes needed quite selective use on the final mix, you'd be surprised just how fierce a mild-mannered clarinettist can get if you ask them to imagine that they're playing their instrument on a ninth-century battlefield, knee-deep in dead bodies! Of course, Macbeth's side loses the final battle, so the piece comes to its bloody conclusion scored with orchestral strings in the key of C minor accompanied by the haunting tones of a cor anglais and French horn playing at minor third intervals.
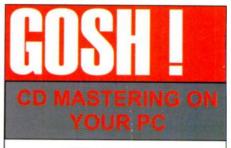
THE FINAL REEL

All the finished pieces (about 35 in total) were mixed down to DAT with SMPTE cue points marked on a DAT schedule listing their exact start times and durations. The tapes were then delivered to the film company, and I spent a day at the film studios working with the film's editor on the placement of the music and suggesting ideas for effects and levels for the final mix of music, dialogue and ambient effects. Everyone seemed pleased with the finished result and the film should have its premier sometime in May 1997.

It really is great to be able to get your teeth into a project such as this which offers so much potential for musical drama. Working with so many talented musicians is also a great buzz — and although, when you hear the finished results, you always feel that there are parts that could be better, nine times out of ten you're so relieved when it's all over that the pain and worry that went into the production seem somehow all worthwhile. Soundtrack writing does have its drawbacks, however. If you view it as a way of letting a mass audience hear and appreciate your music, you may initially be disappointed at the comparatively small role that some of your favourite pieces might actually play in the final cut. And many people would get a bit freaked out at the idea of having to be creative under such enormous pressures (the bulk of my work on *Macbeth* was finished in just over nine days). But if you can cope with writing music that has to follow someone else's timings and has to fit exacting criteria in relation to style, length and content, and you don't mind cutting down on a few luxuries such as sleep and food over the last few days approaching the deadline, it could be just the job for you! **SOS**

ENERGISE!

SPL STEREO VITALIZER MK II

in the scheme of things. First out of the bag comes Drive, and this sets the level of the signal sent to the side-chain for processing. A clip LED warns if the drive is too high, but the manual states that different amounts of drive will produce a different result — and I take that as further evidence that the system responds to programme dynamics in some way. The overall level of the mid- and bass-end processing is controlled by the Process knob, and

PAUL WHITE tests the latest incarnation of the mysterious Vitalizer, and is still none the wiser about how it actually works.

This latest instalment in the Vitalizer saga, the Mark II, combines the features of the original stereo model with the low-end compressor found in the Tube model; to bring the cosmetics up to date, the 1U black anodised front panel is screened with a blue marbling effect which closely resembles the laser etching used on the more up-market SPL products.

It's equipped with both balanced jack and XLR inputs and outputs, and the interfacing is handled by SSM2141 and SSM2142 balanced driver chips, which means that if you use a mono jack to provide unbalanced operation, you won't experience any level changes. Mains power is via an IEC connector, and an illuminated power switch is fitted to the front panel. As this is a dedicated stereo unit, both channels are operated by a single set of controls and this helps to keep the front panel looking clean; the use of simple straight-sided control knobs gives the whole thing a reassuring, professional look.

CONTROL

Before getting any deeper into what the Vitalizer Mk II does (or appears to do), it's probably best to go through the controls and try to explain their role

this is quite separate from the high-end processing, controlled by the intensity knob in the next section along. What happens when you turn up Process depends largely on the settings of the Bass Soft/Tight knob and the Mid-Hi Tune control. This latter control sets the frequency above which the mid-range is subjected to processing and, though the range is from 1kHz-20kHz, a setting of somewhere between 3 and 5kHz is usually best. If you turn it all the way up to 20kHz, you'll be processing a part of the spectrum normally of interest only to bats and dogs, so no audible effect will be apparent. The mid-range processing is, according to the manual, where amplitude-dependent phase-shift comes in to create a sense of loudness without significantly changing the spectral composition of the signal.

Skipping back to the Bass control, this certainly does modify the spectral content of the signal, and it's not difficult to produce a kick strong enough to make most nearfield monitors lose their grip on reality. To accurately evaluate what's going on here, you really do need monitors with a decent bass response. Turning the Bass knob clockwise from the centre to the Hard position results in a tight, punchy bass lift, whereas turning it towards Soft brings in a very deep, less focused bass end capable of shaking bass drivers from their mountings. No sub-bass generation tricks are used here — it's another case of redistributing and amplifying what's already there. At the same time as you boost the bass, the lower mid range dips to allow the bass to do its thing unhindered. ▶

▶ These frequency-response modifications are closely linked to the Fletcher Munsen loudness curves, and tend to exploit the way the human hearing system perceives music heard at different amplitudes. The outcome is that mixes tend to sound louder and less boxy when they're played back at domestic listening levels.

Making its first appearance outside the Tube Vitalizer is the Bass Compression control, a one-knob, automatic compressor designed to act only on the side-chain portion of the bass-enhancement signal. The idea is that the average bass energy of a mix can be increased using compression, but because none of the original signal is processed — and because the mid- and high-frequency enhancement components don't pass through the compressor either — you don't suffer the usual compressor problem where bass sounds suck out the high-end detail. Once the Mid-High Tune frequency is set and the amount of bass enhancement decided, the overall degree of enhancement can be conveniently adjusted using the Process control. As Process is increased, the bass lifts and the lower mid is simultaneously pulled back. A blue LED comes on when compression is taking place, and because there's only one compressor knob to adjust, setting up is really very fast.

High-frequency enhancement is controlled by a completely separate section, not by the Process knob. Instead, there's a Frequency knob to set the point above which high-frequency processing occurs, and an Intensity knob that sets how much processing you hear. The range of adjustment is from 2kHz-20kHz but, once again, most sensible values seem to be between 3 and 8kHz. The processing involves steep filters and phase manipulation, but no precise details are provided. An illuminated Active button brings the whole enhancement process in and out, while a further knob and bypass switch bring in a simple stereo expander based on the old principle of feeding phase-inverted signals into opposite channels. This works surprisingly well; if you put the signal into mono, the added components simply cancel out, causing nothing but a slight level change, so there are no compatibility problems.

VITAL SIGNS

Despite the technical and cosmetic changes, this box is still a pedigree Vitalizer at heart and produces that characteristic effect of making every part of the spectrum seem clearer and more solid. The bass enhancement is sensational on dance tracks, though it is equally useful for beefing up wimpy bass guitar, bass synth or kick-drum sounds in pop mixes. Having the ability to compress the bass enhancement is a useful facility, as it allows you to add more bass energy without allowing the overall level to get out of hand.

The top end of the mix does take on a nice crisp edge when it's processed through the Vitalizer Mk II, but the sound is rather different to what you'd expect from, say, an Aphex Aural Exciter, where new harmonics are added. It's

> "Despite the technical and cosmetic changes, this box is still a pedigree Vitalizer at heart and produces that characteristic effect of making every part of the spectrum seem clearer and more solid."

VITALIZER MYSTERY

The Vitalizer has been around in one form or another for some years now, and I know that quite a few of you have bought one, and I have too, so I find it frustrating that I don't really know what it's doing. Look in the manual and you'll see a series of complex EQ curves, and if you overlook the phrase 'dynamic phase shift', you could easily accept the Vitalizer as being simply a different type of equaliser — but there's clearly more to it than that. Though I've tried on numerous occasions, I haven't been able to duplicate the effect of the Vitalizer using conventional EQ, yet it doesn't sound like a typical enhancer either. It's certainly a 'more of everything' box, and it's quite easy to set up once you get the hang of it, but it claims not to add synthesized harmonics or distortion. Like an enhancer, it adds the processed signal to the original untreated sound and, as with an enhancer, the mix sounds more transparent and detailed, but there's also a significant amount of bottom-end enhancement and mid-range trickery going on too.

probably fair to say that the harmonic enhancer is capable of the most dramatic results because it isn't limited to working with what's already there — but unless your recordings are absolutely hopeless, the Vitalizer should be able to make some improvement at the high end, and with less likelihood of the end result sounding harsh if a lot of processing is needed.

SUMMARY

Even the cheaper Vitalizers tend to be more expensive than traditional enhancers, but I still maintain that they're worth it. I've used the original Vitalizer for a long time now and I like the flexibility it gives me to touch up complete mixes or subgroups. I've never actually used it in mono, so having a stereo model wouldn't limit me in any way at all, and it's obviously easier to set up one set of controls than two. On a practical note, the new output stage is a good move — my old unit still suffers from level changes if I use it unbalanced, but you won't have that problem with this model.

I also like the addition of the compressor and High EQ tune control — I've never felt that I needed them before, but once you get a bit more flexibility, you soon find ways to use it. If you haven't yet had a chance to listen to a Vitalizer, I'd strongly suggest you do so before deciding on what type of enhancer to buy. There are very few unique processors on the market, but this is undoubtedly one of them, and there are very few mixes indeed for which I don't use it to some extent. **SOS**

Anatomy of a Mixer

HUGH ROBJOHNS shrinks to microscopic size in order to show you around the conglomeration of knobs, wires and circuits that make up a mixer.

Mixing desks come in an extraordinarily wide variety of sizes, with an equally wide range of facilities, from the most basic 6:2 design through to the all-singing and dancing 100+ input multitrack monsters. They are available in many different configurations too, such as the common split console or multitrack in-line desks, knob-per-function or assignable control surfaces, and now, of course, digitally controlled analogue, or even true all-digital boards.

Despite this enormous diversity, many aspects of operation and anatomy are common to all mixers — you'll find that with an understanding of the fundamental principles, together with a bit of common sense, even the most daunting state-of-the-art console will become (almost) child's play.

BASICS

All mixers share the broad outlines of a common signal-path design, simply because they are all intended to perform the same basic functions. The exact detail will inevitably vary to suit the intended use and price of the desk, but the principles remain

the same: a mixer combines signals from a number of sound sources, processes them to produce an acceptable balance and quality, and passes the resulting mix on to a recorder, broadcast chain or PA system. (Most mixers are actually multiple mixers, because they provide more than just one combined output signal.) The mixer will therefore require a number of input channels, each capable of handling signals at either microphone or line levels, with facilities to adjust their levels and equalisation; in addition it may generate extra, separately controlled, mixes for effects units, foldback or cue feeds, and multitrack recorders. On top of all that, the desk must provide a means of listening to and metering individual channels, the complete master mix, or the alternative output mixes, so that the controls can be adjusted correctly and problems identified.

Most desks have a similar signal path: the input signal from a microphone or line source passes through the microphone amplifier or line buffer stage, where the signal level is optimised for headroom and noise performance, then passes on to the equaliser, before reaching the channel fader. Auxiliary outputs will usually be immediately before or after the fader, and there may also be insert points where the signal can be extracted from the desk, processed externally (perhaps with a compressor or noise gate), and then returned to continue through the desk.

Next, the signal is routed to the available outputs or groups as appropriate. In the case of the groups, the signal may pass through an additional equaliser stage in the groups before reaching the fader, and further routing to the main desk outputs. Groups are provided to make it easier to control a large number of signals, or to allow a single signal processor to affect a collection of channel signals simultaneously.

In the following paragraphs, I'll look at some of the aspects of each section in the signal path, and some of the alternative design and operational concepts.

INPUT STAGE

The first element in the signal path is the microphone amplifier and general input stage. The design of the mic preamp really defines the sound character of the entire desk, since any quality loss at this stage can never be regained. For this reason, it's common practice in multitrack studios to use a few extremely high-quality (and therefore expensive) external microphone preamps in place of the often indifferent ones built into an otherwise good mixer.

The mic amp has a very difficult job to do: it must provide a lot of signal gain with the absolute minimum of background noise; it must have very high headroom so that unexpected peaks do not cause overloads; and it must preserve every subtle nuance of the waveform captured by the microphone, from the lowest frequency to the highest, with a wide dynamic range.

Assuming that the basic design is capable of achieving all these things, there are some practical demands too. The highest-quality microphones are generally of the electrostatic variety, and these usually need a power source to polarise their capsules and power their internal preamps. The mixer normally provides this in the form of 'phantom power', ▶

Anatomy of a Mixer

▶ independently switchable from each channel.

All directional mics are susceptible to low-frequency mechanical vibrations such as handling noise, and these unwanted subsonic signals can very quickly use up any amount of available headroom. To counteract this problem, the microphone stage will normally include a

switchable high-pass filter which will remove subsonic rubbish, preferably without affecting the wanted sound in a detrimental way.

The better mic preamp designs usually have a very wide gain range so that a sensible signal level can be obtained no matter how loud or quiet the original sound source, or how close or distant the microphone (within reason, of course). This is often provided in the form of a switched coarse-gain control (with maybe 5dB or 10dB steps), and a separate, continuously variable, fine trim. However, cheaper desks usually economise with a single variable control which covers the entire gain range. In pure engineering terms, the former approach is technically superior, but there are a number of perfectly respectable designs using the latter technique these days. For maximum flexibility, an input stage with up to 70dB of gain is desirable, but this places great demands on the circuit design. Most home-studio applications can manage with as little as 50dB of mic gain, which relaxes the design constraints considerably.

Having a particularly sensitive mic preamp can be very useful, but what happens when you place a microphone somewhere very noisy — inside a kick drum or down the bell-end of a trumpet? It's not unusual to find mics generating line-level outputs in this kind of situation, so, to avoid overloading the microphone input stage of the desk, there's usually a switch to insert a 'pad' or attenuator ahead of the preamp, reducing the signal level, typically, by 30dB.

The input stage also often includes a switch to invert the polarity of the input signal — phase reverse. This can be very useful when you're combining the

outputs of several microphones, all of which are capturing a common signal source. Although there's a recognised world standard (XLR pin 2 positive, pin 3 negative), some manufacturers don't adhere to it, and so not all microphones generate the same polarity of output signal under the same circumstances — and if mics of opposite polarity are mixed together, their outputs tend to cancel out rather than adding together. The phase-reverse switch is provided to take advantage of this, allowing the operator to control how the outputs of different microphones add to or cancel out each other.

Finally, most desks include a means of selecting microphone or line-level inputs to the desk channels, these normally being connected on different sockets. The more expensive desks will provide separate gain controls for the microphone and line inputs, the cheaper desks merely a selection switch.

When you're setting input gain on a channel, it's important to de-select any equalisation, and put the channel fader at its normal operating position (0dB on the scale), before you adjust the gain, to bring the sound source to the appropriate level. If you don't do this, the input stage won't be operating under ideal conditions, and will suffer from reduced headroom or an increased noise floor.

The channel faders are provided as a convenient means of adjusting levels during a recording or performance. If the fader spends its whole time flat out or down towards the bottom of its travel, the input gains have been wrongly set and your desk is not working as well as it could.

AUXILIARY SENDS

The number of auxiliary outputs from a channel will depend on the intended use of the desk, but normally ranges between one and eight. The sends may be switched to derive their signals from before (pre) or after (post) the channel fader, so that the output signal level will be either independent of or dependent upon the position of the fader. Usually the pre-fader auxiliary send is taken from a point after the channel equaliser, but some desks provide an option to take it from a point before the equaliser. There are advantages and disadvantages to both, depending on what you're using the pre-fade sends for. For example, a pre-EQ feed might be better for foldback purposes so that adjusting the EQ doesn't risk creating feedback, whereas post-EQ feeds would be better for effects or headphone cue signals. In general, pre-fader sends are used for foldback or cue signals, so that opening and closing the channel faders won't affect the performers' monitoring. Post-fader sends are normally used for house PA in theatrical and broadcast situations (so that the audience only hear sources when they are faded up), and also for most types of signal processing, particularly artificial reverb.

The use of post-fader auxiliary sends is crucial if a single effects processor is handling the contributions from a number of channels, because when a channel fader is closed, its direct contribution to the output is removed, as is its send to the effects unit. If a pre-fader send is used, the channel will ▶

Anatomy of a Mixer

▶ still be contributing to the effects send even when the channel fader is closed, and so will continue to be heard through the effects return — probably not a desirable state of affairs...

To cut down on the number of (relatively) expensive buttons, many desks select pre- or post-fader status for pairs of auxiliary sends, and so a little planning may be required to optimise the use of the auxiliaries for a particular situation. Bigger desks may also provide one or more stereo auxiliary sends, normally using a pair of mono auxiliary busses, where one send control becomes the stereo send level knob and the other becomes a pan-pot.

ROUTING

The output from one channel has to be combined with that from other channels. In the simplest desk, all channels may be permanently routed to a master stereo output, but more typically channels are routed through groups and from there to the main outputs.

Depending on the intended role of the desk, there may be anything from two to 48 groups, with varying levels of sophistication in terms of additional equalisers and auxiliary sends. Commonly, the groups are allocated in pairs, with the channel pan-pot providing the means of restricting a signal to a single group, and image positioning within a pair of

groups for stereo working. On the subject of stereo, it's always better to use a dedicated stereo channel for a stereo source rather than a pair of mono channels panned left and right, because channel gains, fader positions and equaliser settings must be matched between the two sides of a stereo signal — awkward to do with separate channels, but very easy with a dedicated stereo channel.

A useful point to note: unused channels should not be left routed to groups or main outputs because this often degrades the noise performance of the mixing stages (although this will depend on the precise detail of the circuit topology used).

STRUCTURE
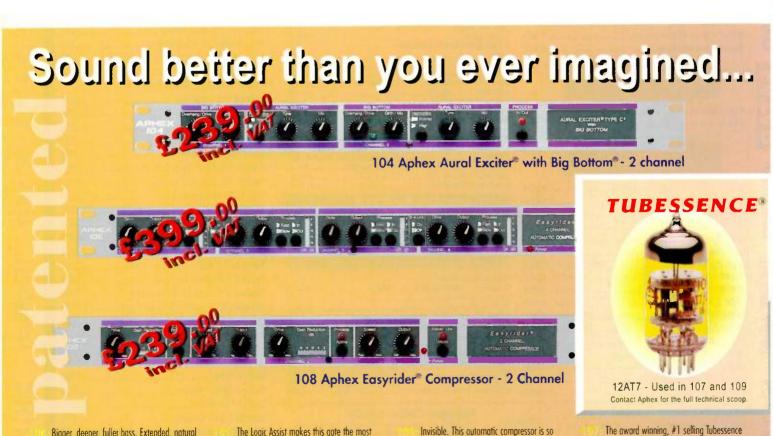
Most general-purpose mixers have a very simple and easy-to-understand structure where the input channels are routed to a small number of groups, and from there to the main outputs. However, this simple structure becomes complicated if the desk is intended to work in conjunction with a multitrack recorder, particularly if a large number of tracks are involved. In the case of multitrack mixers, the normal convention is to feed each tape track from its own group (thereby allowing multiple channels to feed a single track, such as for bounce-downs), so 24, 32 or even 48 groups may be necessary.

Although this isn't a technical problem, it would

EQUALISATION

Facilities for equalisation will depend on the intended purpose of the desk, as well as its pricing. On the most simple line mixers, for example, there may not be any EQ at all; on a fully specified multitrack board, the EQ may boast five overlapping and fully parametric bands.

However basic or elaborate the equaliser, its most important feature is a Bypass switch, so that the original and modified signals may be quickly compared. The human ear has a poor 'memory', and without a direct comparison, it's very easy to believe that your equalisation has improved the sound when in reality it's only made it louder or brighter!

On channels intended to handle effects returns and the like, the EQ facilities may be restricted to little more than bass and treble controls, whereas on normal inputs, one or more mid-range sections are usually included, possibly with variable bandwidth (or Q) controls too. In general, the equaliser sections on most mixers are intended to provide gentle tonal correction to compensate for unfavourable microphone positioning and to help signals 'cut through' in the overall mix. Although there are always exceptions, desk equalisers aren't normally much use for removing narrow-band noises such as hum or PA and foldback feedback; purpose-designed outboard equipment is far more effective.

To use EQ effectively, you need to listen critically to the sound source, identify what is wrong or needs adjustment, and try to analyse which parts of the frequency spectrum to adjust. Switch the EQ in, make the adjustments, listen to the result and then switch the EQ out again to compare what you've done with the original sound. Switching the EQ in and out will make it very clear whether you really have corrected the problem you identified in the first place, or just made things brighter and louder.

The other trap to avoid is spending a lot of time equalising a sound in isolation. When you listen to a channel by itself, apply corrective EQ to remove unwanted rumbles, spill or whatever by all means, but don't get bogged down in making it 'sound right' — the 'right' sound for a particular source will depend on the other instruments and their balance within the total mix. Really creative equalising, to make the instruments fit properly into the mix, can only be done when everything's more or less properly balanced. Remember, EQ adjusts the level of a signal at different frequencies, so it will affect how the sound sits in the mix.

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make a conventional desk rather large, especially when some means of monitoring the tape tracks is incorporated. The latter facility — a monitor section — is actually another complete mixer, so the structure of the desk becomes: Input Channels — Groups — Tape Monitor Channels — Stereo Output. Imagine a desk with 72 inputs, 48 groups and 48 monitors, all side by side: impressive it may be, but practical it ain't! This kind of structure goes under the generic name 'Split Console', because the recording input and monitoring functions of the desk are entirely separate. While it's simple to understand, this design approach quickly becomes unwieldy as the number of tracks increases, and performing simple functions such as bounce-downs often requires external signal patching to re-route monitor returns through input channels and then on to the group sends.

To overcome the operational impracticalities of the simple Split Console, an alternative solution was developed, which became very popular with the introduction of the original SSL 4000-series desks. This is called the In-Line arrangement; although it's more complex in concept, it is considerably more flexible and requires much less physical space. In an In-line desk, the channel sections become Input-Output (or I/O) modules because each strip incorporates all functions for the ▶

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▶ channel inputs, group outputs and monitor returns corresponding to the relevant strip number. In other words, module 6 contains the microphone and line inputs for channel 6, together with its auxiliary send controls and equaliser, channel fader (usually a short-throw fader) and output routing. It also contains the mixing amplifier and output fader for group 6 (normally tied directly to track 6 on the tape machine). The off-tape monitor facilities for track 6 will also be on this module, and will be provided with auxiliary sends, an equaliser (although these are usually shared with, or borrowed from, the channel paths' facilities), and a monitor fader (usually a long-throw design).

Building the desk in this configuration allows many economies in facilities — and therefore cost, control knobs and overall size — such as the sharing or splitting of auxiliary sends and equaliser sections between channel path (record signal) and monitor path (replay signal). Furthermore, extremely flexible signal routing for operations such as track bouncing becomes possible with the addition of a few electronic switches within the desk itself (external signal patching is rarely required); the channel and monitor fader functions can be swapped over at the press of a button, allowing the channel or monitor signals to be controlled by the most

appropriate type of fader for the job in hand.

It also means that, during a mix-down from tape, you can use the unused channel paths to provide inputs for sequenced keyboards or returns for effects units (hence the common marketing line, "48-track desk with 96 inputs on mix-down"). Extending the idea of re-using redundant bits of the desk during mix-down, the group routing facilities can also be re-used as extra post-fade auxiliary sends — and you won't need to patch externally, because a few internal electronic switches can re-configure the entire desk very quickly and easily.

The down side of the in-line concept is that it's very easy to become hopelessly confused about the signal path of a particular sound source unless you pay meticulous attention to labelling and logical thought processes. You only have to imagine a situation where a mic is plugged into channel 6, so it will be controlled by the input section and (small) channel fader in strip 6, then routed to tape track 17, so the group trim control will be on strip 17, as will the monitor return signal controlled by its own (large) fader. This signal path may not seem too bad, but the potential for confusion grows as you realise that equalisation is now available to both the record (channel) and replay (monitor) sections of the desk, as are the auxiliary sends — and it's surprisingly easy to inadvertently set up multiple effects or cue sends on the same signal but from different I/O modules.

CONTROL SURFACES

Traditionally, each operational control on a mixer has its own control knob but, as consoles become larger, you'll find that you can no longer reach all of the controls without having to stand up or walk from one end of the desk to the other. Other practical difficulties arise too: the time needed to reset the desk between sessions, the sheer cost of fitting the control knobs, switches and potentiometers, and so on. These problems have lead to the increasing popularity of assignable consoles, whose greatly reduced number of operational controls can be assigned to alter the parameters of a selected channel.

To understand the operational implications of assignability, it's worth considering the functions

INSERTS

Most desks provide insert points on channels, groups and main outputs, to allow outboard processors (normally compressors or noise gates) to be inserted in the signal chain. The more expensive desks will have separate sockets for the send and return signals, whereas the cheaper desks economise with a single TRS-style jack socket, requiring a Y-lead to break out into separate send and return connectors. The insert point may have been installed at a number of different positions in the signal path, either pre-

EQ, post-EQ but pre-fade, or post-fade. You can sometimes configure the insert position by links on the circuit cards or by switches on the control panel, or there may be two sets of insert connectors for different positions in the signal path.

It's important to know where the insert point is in the signal flow, because this can affect how the inserted signal processing will function. For example, a gate must be inserted pre-fade, otherwise moving the fader will effectively alter the gate threshold and destroy its alignment. However, it must also be pre-EQ for the same
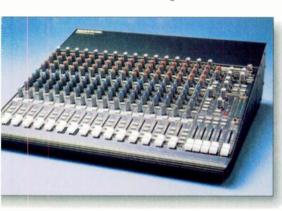
reason (adjusting EQ will mess up its threshold setting). Inserting a compressor pre-fader means that the channel fader effectively acts as a make-up gain control, whereas inserting it post-fader means that the channel fader becomes the compressor's threshold control. Adjusting the fader position will have very different effects under these two circumstances.

Insert points aren't only used for introducing a signal processor into the channel path; they can also provide a 'Channel Separate Output', perhaps to feed a multitrack recorder when you're using the mixer to balance the live

sound during a gig. If the desk has separate send and return connectors, you can simply connect the send side of the insert to the multitrack input. However, on TRS-equipped desks, the signal path through the channel goes through the 'Send' terminal on the socket then loops through to a back-contact on the 'Return' terminal, before resuming its path through the rest of the channel. Plugging into the socket will break the back-contact and so a TRS plug must be used: this is specifically wired to reinstate the loop-through while extracting the send signal for the multitrack recorder.

of a conventional control knob. Its obvious role is to alter a particular signal parameter, such as level or turnover frequency in an equaliser, and there are two parts to this — each knob provides direct access to a specific function, but on the end of the control shaft is the actual device that changes the intended parameter. Each control knob also indicates of the current state of the parameter, so a less obvious, but vital, role is to act as a memory (the knob will not move by itself, so it effectively 'remembers' its previous setting). These are functions you take for granted, but they become crucial when you start considering assignable console designs.

Given that we only have two hands, it's been argued that an assignable mixer only requires one or two control knobs. Although a couple of desks have followed this approach, most designers accept that it's not the most practical way of operating a mixer. A better idea would be to have a single assignable channel strip with all the channel controls for gain, equaliser and auxiliaries, but also a complete set of individual channel faders. An 'Assign' button on each fader would recall the channel's parameters to the assignable strip. This is quite workable in many situations, but where faster access is required, or if one channel strip must remain continuously available, two or more assignable channel

strips would be better — and, of course, this would also allow channel settings to be compared more easily.

One of the biggest problems for new users of assignable desks is that of no longer being able to gaze across a control surface to check on the relative settings of, say, the Aux 4 controls. An assignable desk usually requires the much more laborious technique of recalling individual channels, one after the other. A couple of desk designs have overcome these problems by allocating one or more control knobs to every channel, and allowing a specific parameter to be allocated to these knobs — so the Aux 4 setting across the entire desk

can be seen at a glance, and crucial controls can be kept constantly to hand. In fact, being able to allocate parameters to alternative controllers is a useful spin-off from assignability. For example, why not set up an auxiliary effects mix on the faders rather than on the traditional aux pots? A very simple idea, but stunningly effective. Assuming you can find an assignable system appropriate to your particular needs — and assignability is not necessarily the panacea of future desk design — this approach allows very easy implementation of total automation and instant desk-wide setting recall, which are undeniably very useful.

Although assignability is widely associated with digital desks, it's also perfectly applicable to analogue desks. However, assignability requires a digital control surface, hence the term 'digitally controlled analogue' — an approach that currently represents the apex of mixer design.

Ideally, a well-designed system has the ultimate in control ergonomics, the benefits of total automation, single-operator control of ridiculously large numbers of channels, and the high-quality performance of analogue electronics.

DIGITAL DESKS

To many people, the pointy bit at the top of the mixer pyramid is labelled 'digital'. As most digital mixers use assignable control surfaces, the only significant difference between a 'digitally controlled analogue' desk and a truly digital one is the audio processing path — an obvious statement, but important.

A top-quality analogue mixer has vastly greater signal bandwidth, and significantly lower input noise floors, than any digital desk fitted with mere 16-bit A-Ds and D-As. However, a digital desk can provide up to 1500dB of internal dynamic range once the signal is within the digital domain, so that it's practically impossible to overload the desk's mix-busses, or even to hear any noise from them, no matter how many channels are mixed together.

In reality, it's still relatively early days for digital desks, mainly because the current generation of analogue/digital converters can't match the capabilities of top-notch pure-analogue designs. However, as the resolution of converters exceeds 20 bits, and as manufacturers increase the sampling rates — there's a growing lobby in support of 96kHz sampling — it seems certain that, in a few years, digital mixers will replace analogue ones completely. **SOS**

Reversing into the Future?

DEBUNKING THE RETRO MYTH

Is the current craze for all things retro preventing music technology from moving forward? DAVID MELLOR assesses the value of retro equipment and sees a vision of a thoroughly modern future.

I t is a commonly held belief among cultures the world over, and throughout history, that most of the true wisdom of the culture lies in the past and has somehow been forgotten, carried forward in time only through myth and legend. Why are modern buildings so ugly? Why can't a fridge still last for 30 years? Why don't England win cricket matches any more?

Turning to music, why is it that most of the guitar heroes listed in a recent poll built their reputations back in the 1960s? Why are the '50s-designed Fender Stratocaster and Gibson Les Paul guitars still such popular instruments? Why, if you wanted to buy a classic keyboard, would you go for a Fender Rhodes Mk I rather than the 'improved' Mk II? In the world of hi-tech music making, there is a definite resurgence of old technology, particularly of synthesizers, microphones and signal processors. But were these devices really better in the old days? And how far should we go in trying to recapture these lost sounds?

TOTALLY TUBULAR
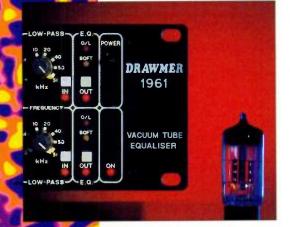
These days, most issues of *SOS* have reviews of 'retro' signal-processing equipment: retro usually in the sense that the equipment employs valves — or 'tubes' as they say in the USA — as the active devices, rather than discrete transistors, integrated circuits (which you can think of as lots of transistors formed on the same chip) or bang-up-to-date surface-mount technology. In the days when valves were everywhere and transistors were just coming in, manufacturers couldn't wait to get rid of valves, since their disadvantages were all too apparent. Designers were glad to get rid of them, but the problem remains that valve distortion just happens to be subjectively more pleasant than

The Drawmer 1961 made use of valve technology to recreate a vintage sound.

transistor distortion, and is often interpreted as adding 'warmth' to the sound. Guitarists know all about this, of course, and fully exploit the distortion-generating abilities of valve amplifiers. Valve distortion also tends to increase gently with level, whereas transistor distortion comes in suddenly and harshly (though a lot depends on the circuit design, as well as on the components). In recording, a little distortion is often considered to be a good thing, but trying to generate pleasant-sounding distortion using transistors and integrated circuits is a difficult task. It's a little easier with FETs (field effect transistors) which have certain similarities with valves, but many would say that the true sound of the valve can never be replicated exactly.

But is it, in 1997, impossible to build equipment to the same standard as in the old days? Did we once possess the knowledge of how to create perfect mics, equalisers and compressors, and now we have forgotten it? Or does time have a mellowing effect on valves the way it does on antique violins? Many people claim that to get the real sound of valves you have to turn to the genuine old equipment, such as the Neumann U47 and U67 microphones or AKG C12, which will cost you an arm and two legs to add to your mic cupboard. As far as outboard equipment goes, Pultec and Fairchild are the names to look for in EQ and compression; once again, though, even secondhand their limb cost is high. Some musicians go as far as buying up old valve mixing consoles in the belief that they somehow contain the magic of a bygone age of music-making, and hope that the new sounds they record will acquire just a little bit of this fairy dust on the way through.

Valve equipment does have a place in the modern recording studio. But as more and more newly designed valve equipment becomes available, we should be able to stop looking over our shoulders into the past at classic valve mics and compressors, and have equipment that is as cool (temperature-wise), efficient, and easy to interface and operate as modern equipment can be. It will also be low-noise and reliable (with the valves easy to replace), and have exactly the right amount and kind of distortion. Some new 'valve' equipment has no more than a single valve surrounded by dozens of transistors, and though I'm not certain that you can achieve the true sound of valves in this way, generally I look forward to the day when old valve equipment is worthless because we have modern valve gear that is even better!

▶

Debunking the Retro Myth

VINTAGE KEYS

Despite the technological wizardry that is now available in modern keyboards, the old analogue sounds are still very much in demand here, too. Although analogue synths did go out of fashion for a while in the '80s, my feeling is that today's emphasis on all things analogue is not mere nostalgia for a bygone era. Analogue synth sounds were never fully explored in the late '60s, '70s and early '80s — it's only now that musicians are finding out what their old Moogs, ARPs, Prophets and other vintage synths can really do.

The down side of using the old gear, though, is that it is... well, old. Although the old synths didn't use valves, the circuit designs and components were often quite unstable even when they were new, so you wouldn't expect an old synth to be as reliable as a modern digital one. Also, analogue circuitry calls for lots of knobs and switches, and asking these mechanical components to perform faultlessly after 20-odd years is asking a lot.

But if knobs and switches were unreliable, they were also a very effective programming interface. In the '80s, the new crop of digital synths reduced the interface to a couple of buttons and a tiny LCD display; this did offer cost advantages, and being able to store sounds within the instrument or on a data card was far better than using scribbled charts of knob and switch settings, but even so... A return to knobs has recently begun, perfected by instruments such as the Clavia Nord Lead synth, which offers an ideal compromise: totally digital inside, it uses the latest physical-modelling techniques to produce extremely authentic analogue synth sounds, but they're accessed through an old-style user interface.

The Moog Minimoog — a classic that deserves its status?

YOU GOT THE LOOK

Judging by the success of the Clavia Nord Lead in bringing together old and new ideas, it seems that a large part of the popularity of retro is in the look and feel of the equipment as well as the sound — there is something very satisfying about controlling fine nuances of sound with a large chunky knob rather than holding your finger on an up or down button and watching the numbers change. Contrary to the digital notion of cramming ever more controls into a smaller package, retro equipment also tends to have fewer knobs on a larger front panel. I think this is important. It may be fun skipping through the preset programs on a multi-effects unit — and it can often lead to interesting chance discoveries —

> "Trying to imitate old designs, rather than exploiting techniques that should be ageless, is only holding us back."

but there's nothing to beat hand-crafting a sound all the way from the source instrument to tape or disk. When you compress with a retro compressor, preferably with a valve or two inside, the large chunky controls give you the feeling that you are doing something really important — which is absolutely true!

Mind you, there's no reason why this can't be done with '90s styling rather than '50s; over the next couple of years I'd like to see the retro movement maturing to a stage where the equipment doesn't look as though it came here via a time warp. I'll keep the old-style VU meters,

Clavia's Nord Lead aims to combine the best of both worlds — cutting-edge sound generation with an analogue-style interface.

since they actually tell you something LED bargraphs often don't (they're a good indication of the perceived loudness of a signal), but otherwise I'll be glad to wave goodbye to new equipment that looks as though it might have been used by my grandad.

ANALOGUE RECORDING

We often think of digital audio as being simply better than analogue, but one has to wonder where analogue would be now if digital had never been invented, and so hadn't drained it of

Debunking the Retro Myth

▶ research effort. Digital recorders are very accurate — few people could tell the difference between a live feed and the output of a DAT machine — but analogue tape has a character that is perhaps even warmer than valves (and really old analogue recorders had valves too): it's frequently used in such a way that it becomes an integral part of the sound. Analogue recorders can be used for both multitrack and stereo recording directly, or they can be used in conjunction with digital equipment to add a little bit of tape distortion. Some say that it is better to leave the conversion to digital as late as possible so that the subtle interactions between very high frequencies are preserved (a good analogue recorder can record frequencies up to 25kHz and beyond).

New analogue multitracks are either expensive — costing as much as a house in some parts of the country — or use narrower tape, which leads to slightly but significantly degraded sound quality. Secondhand multitracks are comparatively cheap at the moment, but you will pay dearly for spares and maintenance. But if buying a secondhand multitrack is currently the only affordable way that some of us can get the characteristic analogue tape sound, then surely manufacturers should be doing something about it? The sound of analogue multitrack should be part of our everyday musical language, available to anyone who takes their recording seriously. The snag is that tape recorders use powerful motors and chunky mechanical components which are always going to be expensive — and the sheer bulk of an analogue multitrack means that storage and transportation costs are high too. But even if analogue recorders are always going to be expensive, I don't see why they have to be so expensive. Just wait until the secondhand market in old analogue machines starts going the way of valve mics and compressors and old analogue synths. Then we might see some serious thought on how to bring down the cost while retaining the sound.

ACOUSTICS

If you were going to set up a complete retro studio, then as well as retro equipment you would need retro acoustics — it would be contradictory to admire the sounds of valves and analogue synths, and then not look at the part that studio acoustics played in recording in the old days. Once again, we might be able to plunder the past and use its techniques in combination with our modern ways to achieve new sounds that have never been heard before.

When multitrack recording was starting to become commonplace, one of the biggest problems was that, when several instruments were recorded together, the sound from each instrument would 'spill' into all the other mics,

Analogue tape — we like the sound, but do we want to pay the price?

"If you start off with a factory preset synth patch and use a factory preset chorus and reverb, then you'd better think of some interesting and original notes to play."

so if you solo'd any track on the tape you would hear the other instruments playing in the background. This, of course, limits what you can do in the mix — you can't remove any instrument from the mix since it will still be audible on the other tracks, and when you EQ or process any one instrument, you will always process the spill on that track too. Consequently studio designers tended to go for a dry acoustic, which discourages spill, and absorbing screens were placed around instruments to eliminate spill as much as possible. But over the years engineers have learned to manage spill, so modern studios usually have quite

> "There must be an infinite range of sonic possibilities in the analogue/mechanical domain remaining to be explored."

a live acoustic, and in any case spill can often be beneficial to the overall sound. It's also considered easier to deaden a live acoustic than it is to brighten up a dry room.

In home and project studios, you'll usually record one sound at a time, going straight into the console from sampler, synth or even guitar via a distortion unit. It is always just so much easier to direct inject that you forget that it is possible to amplify any sound source and put a mic in front of the cabinet. If you really want to get a retro sound then you might go so far as to consider DI'ing sampled drums, bass and guitar onto tape, and then playing the recording back with the drums coming through the monitors and the bass and guitar through amps, miking up the whole lot with whatever spill the setup produces. The result probably won't be as good in hi-fi terms as the ▶

THE FUTURE OF RETRO?

The retro equipment currently available strikes a balance between retro for the sake of it and the resurrection of useful old techniques. But when it comes to seeking out wisdom from the past, we've hardly scratched the surface. I'm not looking for nostalgia — which, according to the old gag, isn't what it used to be anyway — but techniques that have fallen out of favour over the years, which could be revitalised in the way that valves and analogue synthesis have. And I don't want to see 20-year-old gear fetching ridiculous prices in secondhand shops; this time I want manufacturers to take the lead and give us equipment that offers the very best of old and new in a thoroughly modern package. Trying to imitate old designs, rather than exploiting techniques that should be ageless, is only holding us back; we need new ideas which will build on the past, not attempt to return to it.

SHURE UHF

Naturally

Debunking the Retro Myth

▶ DI'd recording, but with a certain amount of effort you'll achieve a much deeper and more complex sound, a sound that repays repeated listening, and one that couldn't be reproduced exactly by anyone else (or possibly even by you!). It will be easier to do this in a large room, and you will spend as much time on the mic positions as you would if you had all the musicians in the room playing live, but your recording will be an original and will combine the depth and complexity of the sound of many old recordings with whatever new input your creative mind can envisage.

EFFECTS

As I said, DI'ing instruments is easy, but you end up with a less than interesting sound that's pretty much the same as everyone else's. The only way to make your sound different is to use a digital effects unit, and even then you can find yourself using just the presets. If you start off with a factory preset synth patch and use a factory preset chorus and reverb, then you'd better think of some interesting and original notes to play! Before digital effects units became commonplace, we had to rely on analogue tape effects, analogue effects units and mechanical reverb. All of these had drawbacks — you had to keep turning the tape over every 30 minutes or so, analogue effects units were notoriously noisy, and mechanical reverb units were either ultra-expensive or sounded horrible. Nevertheless, apart from the cheapest of spring reverbs, these devices had something to offer that digital effects units can't emulate exactly.

In the sub-universe of guitar effects pedals, the secondhand market is gathering momentum and you won't see a a 15-year-old and heavily stomped-upon MXR Phase 90 or 100, or an Electro Harmonix Electric Mistress flanger, for less than £100. Once again, I don't believe that we should have to buy old clapped-out units to get these sounds, and I don't want to see manufacturers slavishly imitating their retro design and appearance. We should be able to buy new analogue effects pedals that sound as good, and

> "The fallacy of retro is that the past can give us the solutions to today's problems, which it can't any more in audio than it can in politics."

even better, than the old ones.

For tape effects such as delay and phasing, it's true that you can get sounds with an old Revox A77 that you can't get with digital effects, but even though Revox tape recorders are tough and maintainable enough to soldier on for 20 years or more, they really should be up in the attic somewhere along with those old WEM Copycats, Binson Echorecs and Roland Space Echos, and the reason should be that we have better tape delay and phasing units available to us now, not that we have accepted that we must put up with second-rate digital imitations.

Although digital effects units can't imitate tape effects very well, they are pretty good at reverb, and the only thing that will beat a good digital reverb unit for naturalness is a real echo chamber. Secondhand plate reverb units are therefore dirt cheap in comparison with what they once cost new. Plate reverbs can also be bulky, which tends to limit their attraction for the smaller studio. Even so, there are producers who will book a particular studio because it has a plate they like, and this must be telling us that, to the people with golden ears, plates have something to offer that can't be found in even the best digital units. Once again, as soon as digital techniques became available, all the R&D effort was diverted from the old analogue ways, and as far as

I know there has been no work done in analogue reverb for more than a decade. If scientists and engineers did start looking at analogue reverb again, it wouldn't be to produce a natural sound, since digital reverb units do seem to be very capable of that; there must, however, be an infinite range of sonic possibilities in the analogue/mechanical domain remaining to be explored.

In conclusion, I sense that there is a certain confusion between genuine vintage equipment, modern equipment that seeks to emulate a bygone era, and modern equipment whose designers have sought out the best aspects of old technology and blended it with the best of what today's technology can offer. The fallacy of retro is that the past can give us the solutions to today's problems, which it can't any more in audio than it can in politics. We will appreciate the true value of retro when we realise that, although musical styles may go in and out of fashion, science is eternal and once a technology has been invented, it should remain available to us as long as the world has resources to support it. It's in the nature of the human species to be successful, so let's continue to build on our successes and add to them.   **SOS**

The Roland Space Echo: best left in the attic?

Colin Towns

A deeply private man, ex-Gillan keyboard player turned film music composer Colin Towns recently made a rare appearance to promote his latest project, Colin Towns' Mask Orchestra. SAM MOLINEAUX discovers the true story behind his varied musical career.

Colin Towns is the brains behind Ian Gillan's seminal rock album *Mr Universe*, keyboard player on 10 Gillan albums and composer of everything from TV dramas, animations and documentaries to feature-length films, not to mention over 100 commercial and television idents.

BEHIND THE MASK

Now living a somewhat isolated existence in a tranquil village on the outskirts of Canterbury, Towns rarely strays from his beautiful 16th-century hall, where he's built his own studio in a room adjoining the kitchen and the lounge, as a centre for his composing and recording activities. Towns turned his back entirely on the rock music scene some years ago, and these days is more inclined to spend his working hours composing at the piano and his leisure time listening to a Benjamin Britten opera on CD than to concern himself with the vagaries of today's popular music scene. At 50 years of age. Colin Towns is finally in a position to pick and choose his film and TV commissions, and this success has at last afforded

him the freedom to pursue his pet project, the jazz-inspired Mask Orchestra, unimpeded by the constraints of a commercial record deal. A million miles away from the jazz-rock venture one might expect from a musician of his background, the result teeters on the divide between contemporary classical music and jazz. Not surprisingly for someone who's crossed over into more areas of music than most crossover artists knew existed, he's not too keen on categorisation.

"How do you put music into words?" he challenges when I ask how he would describe the music of his latest album *Nowhere And Heaven*. "I'm using jazz musicians, and we've got some solos in it… I think that might make it jazz. The trouble is that most people can only handle retro jazz these days, and I find that strange because jazz was always up-to-date — that's what made it exciting. It was frightening and outrageous but that's something that's disappeared, in many respects. People want things so easy and I can't quite relate to that."

But before discussing his most recent work, let's flash back to the '60s, when this musical entrepreneur was laying the foundations on London's live scene that would subsequently lead to a career as a successful songwriter and later a serious composer.

FIRST STEPS

It was an uncle who played honky-tonk piano that first sparked off Towns' interest in music, and a keen ear meant that it wasn't long before the teenage Colin was in demand.

"By the time I was 13 I was playing in a dance band. One weekend the drummer's dad knocked at my door and asked me if I'd play in his pub with the regular quartet, so I did that. Then someone put me on to this piano player who was fantastic. He was 10 years older than me and all his friends were jazz musicians. I was just a young kid but I was learning off all these people."

On leaving school, Towns got a day job as a shipping clerk and supplemented his income by forming a hippy jazz outfit and playing at artistic gatherings. Eventually, with a young family to support, he decided to adopt a more mainstream approach and started touring the American air bases with pop groups and country and western acts.

"I got a Fender Rhodes first. It was one of the few things I ever got on HP. And I also got a little Roland monophonic thing — I can't remember what the model was, but it had a really beefy sound. I used it on everything: in the studio, the pop group thing I used to do, I even used it on the country stuff."

Even though he was working all hours gigging and recording, he still kept up the office work.

"I was desperately trying to get out of this day job which I did for about 10 years. But my employers were really good; they knew I could do the job quite well and they didn't insist I get my hair cut or wear a suit — and when I needed a few months off they would let me go."

Clearly not averse to the hard graft of a working musician, Colin Towns was not so much in the right place at the right time as in many places at once when he got the major career break that led to his five-year songwriting partnership with Deep Purple frontman Ian Gillan.

"I was involved at one point with the drummer in Dave Greenslade's band and he shared a house with Greenslade's keyboard player, Dave Lawson. Lawson had agreed to do a tour of America with Ian but backed out at the last minute. A week before the tour Ian rang me up, and that's how I got involved in Gillan."

POST PURPLE ROCK

Ian Gillan's new backing band consisted entirely of session musicians, most of whom were from a jazz/blues background. But even though they worked well together, they were perhaps too far removed from the sound of Deep Purple for the fans. After three albums, commercial success still eluded them and the band split up. Meanwhile Colin had been polishing up his songwriting skills and, influenced by Led Zeppelin's winning formula, he channelled his musical ideas towards rock. Suggesting to Ian Gillan that they give it one more shot, he set to work on sketching out songs for a new album.

Beginning life as an album exclusively for the Japanese market and featuring a combination of Towns and Gillan/Towns credits, it was subsequently released in the UK in 1979 as *Mr Universe* and became Ian Gillan's most successful album since Deep Purple's *Storm Bringer* five years earlier. A massively successful appearance at Reading Rock Festival debuted the new band, and from then on they couldn't put a foot wrong with the fans.

"In the middle of the punk era we were doing three or four nights at the Marquee to audiences of over a thousand — you couldn't breathe, it was only supposed to have a capacity of 600," Colin recalls.

Along with fellow rock veterans Motörhead, Gillan became spearheads for the New Wave of British Heavy Metal (a label first coined in the rock music journal *Sounds*) influencing such younger bands as Iron Maiden, Saxon, Def Leppard, and Diamond Head, not to mention hundreds of other

Gillan's 1979 album
Mr Universe, which Colin Towns co-wrote.

▶

Gillan in 1980.
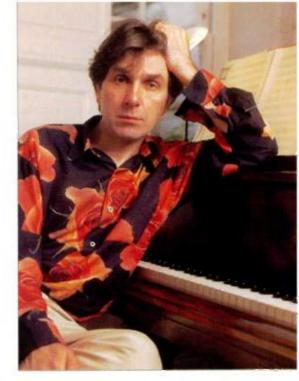
Colin Towns

▶ less successful hopefuls. Gillan's sound, unlike many of their contemporaries, was very much flavoured by a powerful keyboard section, courtesy of Towns.

"I didn't want to sound like Jon Lord and I couldn't stand all that Rick Wakeman crap so I was looking for something other than a Hammond. I settled on a Yamaha organ which I used to put through a rotary cabinet. It was a dual keyboard thing and it looked a bit like a Hammond. I also had an ARP 2600 which I got some interesting sounds out of, although I was terrified to move any knobs or pull any plugs out in case I lost my sounds. And I used a Clavinet, the Fender Rhodes, and a Sequential Pro One. Round the front I had a Yamaha electric piano, the CP70. That was my favourite instrument — it was the electric grand, the big heavy one that was made like a piano with strings in. I had to tune it myself before every gig and I was always breaking strings on it, but it was my absolutely favourite instrument because when I played it I was around the front near the audience and not hidden behind a load of keyboards!"

Despite their success, the Gillan/Towns partnership wasn't to last: by 1982 rumours had begun about a Deep Purple reformation and, after six successful studio albums together, the band split up and Ian Gillan and Colin Towns went their separate ways. Both have different stories to tell of the less than amicable break-up, but 14 years on Towns remains politely reserved on the subject. An innocent question about royalties breaks his silence.

"Turn it off!" he laughs, ordering me to pause my tape recorder so he can voice his true feelings on the matter, before allowing me to record again for his rather more tactful answer: "That was part of the problem — no-one had any paperwork; we just

didn't do it properly. I do see a bit now, years after the event. But I was living in a council house almost right up until the end and we'd had five albums in the Top 20! People didn't believe that we were still skint, but we were. It wasn't well-managed, let's say. It was all a great experience but you've got to move on, move into more challenging musical areas."

A NEW DIRECTION

Despite offers from various bands, most notably an invitation to join Gary Moore's band, Towns decided it was time to jack in the rock scene altogether. Spurred on by the desire to write music for the big screen, he'd taught himself how to write for an orchestra during breaks in the last Gillan tour.

"I bought all these books on orchestration and I taught myself while everyone else was laying about in bed all day doing nothing. I had a publishing deal with CBS and I was always asking them to find me a film to do. And one day they phoned up and said this guy had been in the office with a script and was looking for a composer. It turned out he'd worked with Alan Parker and he was trying to get something of his own off the ground. So I spent a couple of hours in the studio and I did this demo for him. They used the demo to get Mia Farrow and we did the film."

The result was the film *Full Circle* and a soundtrack album of the same name.

"When we did this film everybody thought I'd been doing it for years. They hired a 60-piece group and I had to go with the flow. That was a real turning point. And then, of course, I had something to build on... and the phone started ringing."

To begin with, Towns concentrated on writing music for television commercials, which he recorded in Ian Gillan's Kingsway Studios during down time.

"The first TV commercial I ever did was the Zanussi one — you know, 'the appliance of science'. I used the ARP 2600 for the bottom end stuff, but all the voices were me. The idea of the commercial was that the washing machine had come from outer space, so I did these spacey sounds by multitracking my voice loads of times and ▶

WORKING METHODS

Colin Towns: "I'm not one of these people who ploughs everything through the computer and sees what comes out. You've got to know about the instruments, you can't just get a computer to play it all back for you."

In fact, the only computer in Colin Towns' studio is an old Atari which he uses mainly for convenience rather than necessity, although sometimes he'll bypass it altogether.

"I've got two basic routes when writing for film. Firstly I'll write the music out on manuscript paper, and if I'm writing for an orchestra I'll sit at the piano with the score up on the easel. When I've finished, the guy who's doing the copying for me will put it into the computer and check to make sure I haven't made any daft mistakes. He usually plays it back through one of the Emu Proteus sound modules, and then we'll do a print-out of the parts when we know we've checked everything.

"The other method is for when there's a low budget or if they want to hear electronics. I'll start with sketches and sometimes I'll put a click down while looking at the scene and just write as I go. With this method I might do the whole soundtrack in the studio at my house."

In one corner of the studio is a video setup. A large monitor provides the picture and Colin uses this as a guide when he's writing the music.

"If it's a feature film or other action stuff it has to be absolutely spot on. You've really got to hit it right on the nose," he explains. "I can do it using the video monitor and the timecode which will tell me the speed of certain parts, or the other way I do it is with this book of numbers which I've got: I refer to that and mark into the score where certain things in the film happen. By marking off the first number and taking that as zero I can then work out that at two seconds and five frames, say, Jim stands up and hits his head, for example. I go to the score and mark in everything that happens so that I can see where the music is going to rise and fall. At the same time I have to keep an eye on all the sound effects.

"If I'm working on something like, say, a Beatrix Potter animation, it's not always necessary to work right on the actual movement — you don't have to go from cut to cut. It's more a case of creating an atmosphere. I'll generally work between the start and the end points and if it's electronic then I fill it up with sounds from my CD-ROM collection. And that'll be the final version."

Colin Towns

varispeeding the tape. I did that at Kingsway, but after I left the band I had to set up my own studio."

Starting off with a modest setup of a secondhand Soundtracs desk, a Soundtracs 16-track recorder, a pair of Tannoy Little Red monitors, a Roland echo unit, a cheap Lexicon reverb unit, and a PPG Wave sampling system, Colin began crafting a portfolio of TV commercials. Brands such as Nescafé Gold Blend, Crosse & Blackwell, Budweiser, Harvey's Bristol Cream, Cadbury's Milk Tray, Dulux Paint, Silkience shampoo, Renault, Rover, Vauxhall... they've all received the Towns treatment over the years. Even American companies (General Motors, Dodge Cars, Fendi, Elizabeth Taylor perfume...) were approaching him for music, which came as something of a surprise.

"There's a lot of competition, so I thought it ironic that I got offered American commercials. I wondered why they were ringing me up, because I never go there and America's full of composers. But I suppose I was able to offer them something they couldn't get anywhere else."

Which is?

"There's a trick, really. You have to be able to deal with people and understand the brief perfectly even when the brief isn't very precise, and then you have to come up with the goods immediately," he explains. "I did one recently for a perfume, and the brief was to make it sound South American, huge mountains and all that. So I went that route to start with but they weren't happy, they wanted something more modern. It was a process of elimination; that's the way some of them work out."

Another area which Towns has become involved in is television station idents, and he's worked with Channel 4, BBC, BSB and various European stations in recent years. One of his most challenging commissions was to provide the music for Carlton's range of logo animations, working with the production company who were responsible for the wacky BBC2 idents.

"They wanted to move away from having ridiculous corporate tunes, like they do in America. So we were working on some quite fun ideas, using a lot of sound effects. For instance, on the last lot of Carlton things we did there was this one for a comedy theme and they treated the word like two feet which walk backwards and forwards and bump into the screen — it's quite silly, so we had all this bassoon stuff going on and there was this tune which sort of came out of the original tune for the ident — which I did as a Les Dawson piano thing — and that gave it an identity.

"I write with them in the room usually — they come up with a theme and the main guy has various ideas for noises which I have to interpret. I use an awful lot of samples, mostly from my CD-ROM collection, special effects and that sort of thing."

I wondered how long it took to get these idents together.
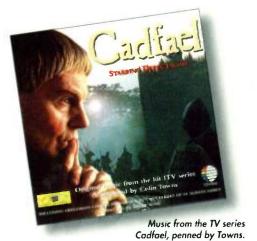
"Well, we got caught out, actually. We thought we were going to be doing 30 idents, which we had planned to do in three bashes — each one takes two or three hours. But they ended up multiplying each

one by five or so for all the different versions, so we had to get 160 idents together and where I was expecting it to take just three days, it took a fortnight. You'd think it was dead simple, you'd knock it off in two minutes, but it's actually really complicated."

But those few seconds of music earn him royalties every single time they're played on television... nice work if you can get it!

BIG-SCREEN ENTERTAINMENT

The bulk of Towns' time, however, is taken up with more substantial projects. Since his first film in the early '80s he's written music for more than 70 films, television dramas and documentaries, and provided soundtracks for a handful of animations including the prize-winning *The Sandman* and the Emmy nominated *Beatrix Potter Stories*. The last couple of years have seen the release of albums of his music for the Disney film *The Puppetmasters*, the BBC drama series *The Buccaneers* and a compilation of music from Central TV's *Brother Cadfael Mysteries*. His most recent projects include the feature film

Music from the TV series Cadfael, penned by Towns.

Space Truckers (starring Dennis Hopper and Charles Dance), an adaptation of Agatha Christie's *The Pale Horse* for Anglia TV, BBC's mini-series *The Crow Road*, two six-part drama series, *The Locksmith* and *Ivanhoe*, an adaptation of Catherine Cookson's *The Wingless Bird* for ITV, a feature-length animation, *The Willows In Winter*, and a fourth series of *Pie In The Sky*. With so much material flowing from his pen, it's hard to believe that the music he provides for his TV and film commissions is always instinctively his own. But Towns insists that every bit comes from him, which usually means cutting himself off from other people's music for fear of absorbing outside influences.

"If I'm working on something I'm finding difficult, I won't listen to anything," he says. "Everything I come up with is my own, although occasionally I'll do something in the style of someone else. In *Space Truckers*, for instance, which is a science fiction sort of thing, featuring cowboy truckers with spaceships moving cargo from one place to another, I came up with this Aaron-Copland-on-speed idea, which sort of worked. Sometimes you have to have something ▶

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Colin Towns

▶ that people can relate to, so I'll lean on other people's approaches to music occasionally."

Due for UK release in April, *Space Truckers* was unusual in that Colin was having to work to an incredibly tight budget.

"They didn't have the sort of budget they needed to do it properly, so what I had to do was concentrate on the big scenes where I thought the music would be heard — there are a lot of sound effects in the film. We recorded those bits at the Bavarian Music Studio in Munich with the Munich Symphony Orchestra — in Germany you can get it done a lot cheaper. The rest of it I did at the studio in my house, and that's where I mixed it all as well," he explains. "For the non-orchestral bits I just used a lot of CD-ROMs because I needed all kinds of noises — lots of mad sounds, things you can't really put names to. The interesting bit was making the orchestral-sounding bits I did at the house work with the real orchestra, using samples and playing them how an orchestra would play, not how a keyboard player would — playing from a score is very different to playing a load of chords on a piano."

The Colin Towns Mask Orchestra's second album, Nowhere And Heaven.

PERSONAL STATEMENT

Every artist needs a platform for their own expression, and the music Colin writes for his Mask Orchestra is his personal statement. The group was formed two years ago, and encouraging reviews of their self-titled debut album and its follow-up live dates set the wheels in motion for their second album, *Nowhere And Heaven*, released last Autumn. But why the two-year gap?

"When I started the band I was determined to get something interesting and challenging going

but it's taken a long time. And we're releasing it ourselves, which involves a lot of investment if you want to get it right."

Colin has strong feelings on the state of the British record industry, and it was the reaction of some of the majors which led to his decision to go it alone and form his own label, Provocateur Records, for this new album. A double CD, *Nowhere And Heaven* was recorded in one day at London's Angel Studios, and subsequently mixed in Colin's home studio.

"It was all live, although I did actually put some sampled instruments into a couple of tracks, but everything is played because that's how those albums are made. What was crucial in doing the jazz album approach was a lot of time to mix it and getting the sounds absolutely right. The idea was to make it feel very dynamic and to get an interesting sound on Maria's [*singer Maria Pia De Vito*] voice. We used loads of different reverb settings from the [TC Electronic] M5000, trying to get exactly the right sound. I didn't want it to sound as if it was a cheap day out."

The Mask Orchestra line-up features a brass-heavy 17-piece band comprising some of this country's best-known jazz musicians — such as trumpet players Guy Barker and Gerard Presencer, and sax players Alan Skidmore, Julian Arguelles and Peter King; the Italian singer Maria Pia De Vito also appears on a number of tracks, and Colin himself, as well as writing all the material (save one cover — Duke Ellington's 'It Don't Mean A Thing'), adds piano backing.

"Because I'm not playing jazz all the time I'm not a great soloist. I can be myself, but I don't push myself in the band because that's not where my strengths lie," Colin explains. "My skill is to put people in a situation where they're responding and coming up with ideas. And that way I think the album is forging an interesting path forward." **SOS**

COLIN ON GEAR

• SOUND SOURCES

"I just use loads of CD-ROMs which I play through the Akai CD3000. I do like the *Miroslav Vitous Symphonic Orchestra Samples*. The other one I use a lot is Peter Siedlaczek's — that's another orchestral set, and there are actually five CDs of his stuff. The most important thing is that they were recorded in a room with the orchestra sitting where they're supposed to sit — in other words, the basses come out of the right-hand side. I once had an engineer who didn't know where the orchestra sit and was complaining because it was too right-heavy — well, that's where they sit, you know!

"I also like *Peter Siedlaczek's Classical Choir*, which I use quite a lot. Oh, I've got loads. Like *Heart Of Africa*, a set of two CD-ROMs which were recorded in Africa — the first volume of that is really useful. And I like Hans Zimmer's guitar samples. Also, for pianos I sometimes use *The Ultimate Piano Collection*, which has Faziolis, Steinways and Bösendorfers — it's the best sampled piano thing I've come across, though it still doesn't work as well as a real piano, which I'll always use if I can. There's also a CD-ROM called *Distorted Reality*, which has lots of mad stuff — that's

quite fun. I've even got CD-ROMs of drum machines — I get asked to do all kinds of stuff.

"I rarely use my Akai S1000, although I will if I need to get a particular sound. The Emu stuff I have there because I never know when I might need them. There's a couple of interesting sounds on the World one, and on the Orchestral one the Gong and Cymbal patches can be useful. For a Japanese play I was doing, I was trying to get a Spanish organ sound, but I couldn't find what I needed. Eventually I used the Bagpipe sample from the Proteus 2 and just clipped off the slide noise at the beginning of the sample and played it in a way that a bagpipe wouldn't normally be played.

"The Morpheus is alright, but I don't really like electronic noises. I did something recently where I had to come up with stacks of radio tracks — pop stuff — so I used it for that. It probably sounds rude to some people but you can knock up that kind of material in 10 minutes, just using loops and stuff. The Morpheus is quite useful for washy noises for those sort of things.

"I don't use the Prophet 2002 any more, but I think it was good for its time. I used it on a series I did for ITV back in 1987. There was a good soprano sax on it and the string bass was the best one I had

at the time. But they wouldn't work now — too dated. It's just there in case I might need it one day."

• RECORDING

"I would consider changing my system from the ADATs because I don't think ADATs are really designed for people like me. They're good, but they're not up to the sort of work I put them through. I've now got five of them, but only because they kept breaking down — I was always sending them in cabs to London to get fixed, but eventually I discovered it was the tape that was messing them up. It cost me a lot of money and a lot of time.

"My ideal way of working was with 24-track, but then you get all the hiss — the quality's not good enough. I'm just waiting for a really good system. It may actually be a hard disk system but I've got to be convinced that it's quick and won't involve a load of sodding about — I haven't got time to punch lots of numbers in, and I've got to be completely confident that the thing's not going to let me down.

"The Lexicon PCM70's all right but I don't use that much any more. I mostly use the TC Electronic M5000, which is very good. I'm stuck on 'Large Hall' at the moment!"

Performing Rites

GORDON REID checks out the street cred of Korg's latest synth and is surprised by what he finds.

KORG iX300 INTERACTIVE MUSIC WORKSTATION

A cursory glance suggests that the Korg iX300 is simply one of those God-awful oiddly-diddly-bop accompaniment keyboards that we once suffered in working mens' clubs and bars on the Costa del Bonk. It even has the words 'Interactive Music Workstation' printed on its top panel, so it can't be of any interest to the real musicians who read *SOS*. Come on, let's leave the iX300 to sad old home organists, and turn a few pages until we find a real review of a real synth with real oscillators and knobs and things...

Hold on a moment. Look closely, and you'll notice that the iX300 displays some striking similarities to Korg's X3 and N364 synths. In fact, it looks like an N364 that's swallowed too many steroids. What's going on?

OVERVIEW

The iX300 is indeed built into an X3 case, although that means that it shares the same ghastly 61-key keyboard as its predecessor. Since 'i'-series instruments are designed specifically as performance keyboards, this is almost unforgivable. The adoption of the X3 case also means that the disk drive lies inconveniently on the left side of the instrument rather than facing forward.

The iX300 also retains the X3's 32-voice polyphony and its measly pair of outputs but, since the instrument is intended primarily for live work, I suspect that this will normally be sufficient. The rest of the rear panel is similarly sparse: MIDI In, Out, and Thru, a sustain pedal input, an assignable pedal

input, and a socket for an EC5 pedal. The iX300 also features a direct computer port that supports both Mac and PC. The connection cables come with the appropriate software drivers, but they are an extra purchase, so don't expect them to be in your iX300 box when you first open it. The final hole is the headphone socket. The headphone socket! Round the back? Oh good grief...

The lean rear panel is in sharp contrast to the control panel, which has more buttons than a pearly kings' garden party. To describe them all would take a long time (or, at least, two manuals) so let's simply take a look at what they do.

SOUNDS

The heart of the iX300 is the revision of the AI2 synth engine first used in the X3, and more recently in the 64-note polyphonic N364 keyboard and NS5M module, both of which have received favourable reviews in recent issues of SOS. With 342 multisamples occupying 14Mb of ROM, 28 drum kits, and a pair of effects processors, it's hardly what you'd call under-powered, even in 1997.

There's no room here to describe AI2, which is a shame, because it's a powerful method of synthesis that deserves re-examination. However, there's no need either, because we've covered it many times before, originally in our review of the X3R in February '94's *SOS*. But if the sound engine is the same, its implementation is radically different.

Unlike the 'X' and 'N' synths, the iX300 offers two GM banks with 128 programs and a drum kit, plus a further 192 programs and 25 kits in ROM. ▶

Korg iX300

"The control panel has more buttons than a pearly kings' garden party."

You can edit these, but you can't store the changes in the original locations, so there are 64 user-programs and two user kits available in RAM. Before you criticise this miserly allocation of memory, you should remember that the iX is primarily a solo performer's or home user's instrument, and is not directed at synthesists keen to explore every possible combination of the programming parameters.

The other area that is in stark contrast to the 'X' and 'N' series is Combis — the iX300 doesn't have any. Since its *raison d'être* is accompaniment rather than conventional sequencing or layering, Korg have, in their corporate wisdom, ditched the Combis entirely. Unless there's a genuine reason for this (such as lack of memory or lack of EPROM space) I reckon that it's crazy. Why not satisfy every requirement? (Answer: for fear of damaging sales of the N364?) Anyway, this mapping of programs and absence of Combis is very familiar — it's the i5S. Indeed, the configuration of the sockets on the rear panel leads me to suspect that the iX300 and the i5S share a common motherboard and are, therefore, cosmetic variations of the same instrument.

ARRANGEMENTS

The iX300 has a huge variety of auto-arrangement and accompaniment functions. The bulk of these are based on 'styles', and it is their quality that determines the success (or otherwise) of the other facilities. There are 108 styles covering most points on the musical map, although four of these are in a User bank, which contains styles considered most germane to the country in which you bought your instrument. Each style has two intros, four variations, two fills, and two endings, and you can select between these as you play. There are six parts to a style — drums, percussion, bass, and three accompaniment tracks — and you can edit these if you like. The styles are then combined with split or layered programs to create the 128 arrangements that sit in ROM banks A and B. There are a further 64 arrangements in the User Bank, and these can be modified and saved to RAM or to disk.

If you haven't heard one of the modern breed of interactive keyboards, you'll find many of the arrangements rather a shock. I was stunned by the authenticity of many of them, as well as by their diversity. In particular, the Blues and R&B styles are great fun, and the Latin and Caribbean arrangements are simply superb: my Colombian girlfriend was dancing Merengue, Cumbia and Salsa as soon as she heard them. In fact, when she first heard the iX300, she thought that I was playing one of her CDs. (Honest, guv, it's true!)

When it comes to playing the iX300, all the usual features are here: synchro start and stop, breaks, real-time transposition, tempo changes, time signatures... you know the kind of thing. But if you want to go further — saving, editing and replaying your performances — you can do so using Backing Sequence, Song Play, and Song Edit Modes. For example, Backing Sequence Mode records three 'tracks' in real time: the melody you played, the

chordal data from which the backing track was constructed, and any button presses you made while playing. You can record these tracks linearly, or using the punch in/out function, and can edit them in step-time fashion after recording. You can insert and delete measures, quantise, copy and bounce tracks, and edit individual events. But the iX300 goes still further. Turning the Backing Sequence idea on its head, you can ask the iX to add its own chords (Interactive Composition Mode) to your melody. You just need to know the key signature, and then keep everything simple. If all this wasn't enough, there are eight further tracks into which you can play additional parts. *Quelle surprise...* that makes the iX300 a 16-channel multitimbral module. And if polyphony is a problem, just hook up a couple of expanders and set some of the tracks to 'external'. Finally, if you're not happy preparing or playing your own songs, you can load somebody else's. The iX300 will play Standard MIDI Files directly from disk and, unlike the i5S, allows you to load an SMF song into memory, modify it in the same way as you would a backing sequence, and then re-save it.

You can record and store up to 10 songs at any given time, subject to a limit of 40,000 events. You can also dump your compositions to an external sequencer for later use with the iX300 itself or with other MIDI gear. (Great cheating possibilities here!) But don't think of the iX as an AI2 expander for an existing MIDI rig — it's MIDI hell. It can be done, but it's too complex to be worth it.

CONCLUSIONS

The iX300 differs from the i5S in only three significant ways: it lacks speakers, it allows you to edit MIDI files, and it looks a whole lot cooler. Of course, that means that it remains as impenetrable as its sibling, as powerful, and, in some areas, as limited. Indeed, its impenetrability is its Achilles heel because, in cramming so many facilities into a single box, Korg have sacrificed the ease of use that would attract many of its natural customers.

Nevertheless, Korg have recognised that there's money to be made from musicians who could find excellent uses for an i5S, but wouldn't be seen dead lugging one around because the image is simply too naff. So the iX300 is the 'i'-series synth for image-conscious musos like you and me. With the same chip set and the same sound as the X3, it's no lightweight in the synthesis department. With the same accompaniment facilities as the top-of the-range i5S (and a few extras) it's no slouch there, either. A close friend of mine makes a very good living playing a mixture of standards and modern tracks in pubs and clubs up North. He's going to love it. **SOS**

Sample shop

Our regular look at the hottest new sample CDs and CD-ROMs.

DIFFUSION OF USEFUL NOISE
audio source library

DIFFUSION OF USEFUL NOISE
(AUDIO CD)

Distributed by East West, Rarefaction's *Diffusion of Useful Noise* is an audio CD full of mechanistic, but not exclusively harsh, textures, the vast majority of which are unpitched. Indeed, many portray the kind of pulsating ambience featured in many early episodes of *Doctor Who*, moments before the all-too-obviously rubber alien appeared. There are metallic winds that wouldn't be out of place on the soundtrack of *Alien*, ring modulators, distorted helicopters, eerie munching sounds and surreal weather. And that's just in the textures section...

The rhythmic sections are equally weird, ranging from gibbering robotic rhythms to something that sounds exactly like a pantomime horse tap-dancing on a very large gong, while eating light bulbs. Various vocoding and gating tricks have been employed on both synthetic and 'found' sounds, and I think it's fair to say that most of the loops are rhythms, but not as we know them! Some remind one of a digeridoo player simultaneously gargling with tractor parts, while others suggest the world clock-smashing championships being played back via a guitarist's voicebox processor. Most of the effects using natural elements allow just enough naturalness through to provide a clue to their origins, but the majority are heavily treated with resonators, vocoders or powerful filters, and many contain highly disguised vocal snatches.

Ultimately, this CD is designed with a particular genre in mind, and in that respect, it contains many intriguing and usable samples. If you're organising a school play based on *Doctor Who*, *Blake's 7* or *Hitch Hiker's Guide*, you'll probably also find it useful. On the other hand, those into new age, ballads or even good old fashioned shred metal need not apply. *Paul White*

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X-FILES OF HOUSE
(DOUBLE AUDIO CD)

It was only a matter of time before the sample CD market jumped on the paranormal bandwagon — and now it's happened, with the less than stunningly innovative title of *X-Files of House*. This double CD set, from Sweden's e-lab, places its flag firmly in the soil of four-on-the-floor dance music and presents the familiar four-eight-, and sometimes 16-bar demo 'songs', which are then deconstructed into sections featuring the drum loops, then the instrumental, vocal and FX parts.

Disc 1 is a 99-track audio CD filled to the brim with the latest house music flavours,

[FROM THE MAKERS OF X-STATIC GOLDMINE]
X-FILES OF HOUSE
deep.&.Tribal.HOUSE.LOOPS.&.samples
WorldWideDistributed by e-LAB, SWEDEN

including some swingbeat and techno rhythms. The standard of the music loops and samples is very high indeed, and any owners of the *X-static Goldmine* sample CDs will tell you the one thing that really stands out about all e-lab's releases is the sheer number of usable loops and grooves that are presented on each CD. To say that this is a true double CD release, however, would be slightly overstating the case, as disc 2 is a mixed-mode CD featuring a small but fairly mixed bag of WAV samples, with the rest of the disc (in audio format) containing demos and odd samples taken from the wide-ranging '*X-Static*' series of sample CDs.

In action, disc 1 is a real injection of fresh air into the otherwise sometimes stagnant waters of dance music. The producers have obviously got their ears to the ground and are not only paying close attention to what is happening in the current house music scene, but are brave enough to try and forge some new ideas too. The result is a 99-track disc that times out at well over 70 minutes and yet has very few low points.

The musical emphasis here seems to be on more intelligent house music loops rather than the frenetic and over-busy sounds of jungle. The familiar grotty organs, analogue whizzes and vintage Roland bass sounds have all been dragged out of retirement (if they ever went away) and are given centre stage in these loops, along with the solid 909 bass drums we have all come to expect.
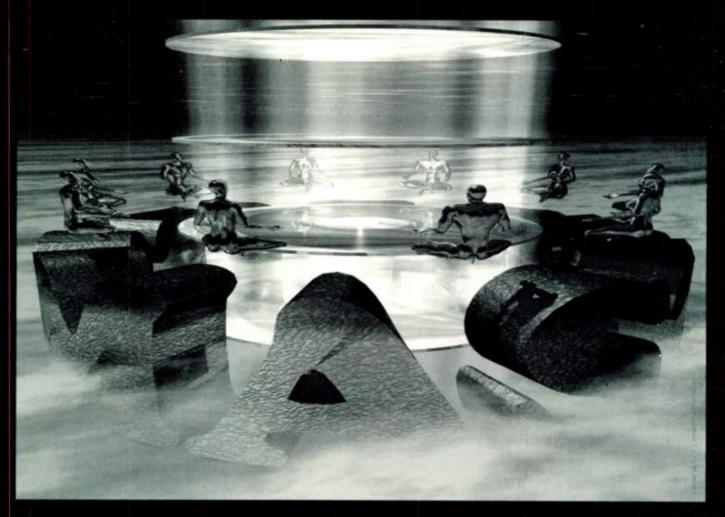
This 'deconstructive' approach to sample CDs has obviously proved successful for many producers, and it does have a certain instant appeal for users who don't want the hassle of mixing and matching their own samples. One thing to be careful of, however, is that you don't just buy into the idea wholesale and turn your sampler into a mere painting-by numbers device. The sounds on this CD are powerful and nasty enough to give you all the tools you need to create a dance-floor smash, so it really is worth making that extra effort to come up with more original and exciting uses of the source material, rather than just sticking back together a track that someone has already chopped up for you.

In conclusion, this release offers a profusion of creative dance-floor possibilities. What it lacks in range of styles it more than makes up for in the sheer number and quality of the sounds. The second CD, filled with rather cheesy WAV and MIDI files, may strike some users as a bit of a gimmick, and most will want to focus their attention on the main body of work on disc 1. If house music is your thing, the truth is in here. *Paul Farrer*

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sample shop

cuckooland vol.2
ghost in the machine

▶ CUCKOOLAND VOLUME 2: GHOST IN THE MACHINE
(AUDIO CD)

In the race to keep coming up with new and innovative forms of sample CD, would-be producers could do a lot worse than take a leaf out of Simon Mills' and Ian Sanderson's book. This follow-up from the weird and wonderful *Cuckooland Vol 1: Unhinged* takes the theme of menacing and dark ambiences even further. It's stuffed full of the most desolate, haunting and downright sinister textural ambiences you've ever heard, taking the form of 30-second stereo tracks which, although they evolve and change slightly over the course of the CD, remain absolutely relentless in their ability to make you feel at best unsettled and at worst frightened to death.

Try to imagine an offbeat fusion of atonal sounds melted down with a vast number of bizarre sound effects; sprinkle in a couple of audio clips from your favourite cheesy B-movie, add some radio static, mix with a misspent youth and allow to simmer in a very large Lexicon reverb for a couple of days. You're almost in the right frame of mind to deal with this CD. If, however, you're looking for some nice drum loops to use for a Boyzone track, I'm afraid you've come to the wrong place.

The 'textures' make good use of the stereo field, and effects-wise you probably won't hear a CD this year that puts so much emphasis on imaginative use of outboard gear. One drawback of this approach is that pushing the limits of sonic possibilities has produced more than a few 'textures' where there is so much bass that I couldn't stop my system from distorting — not that this really bothered me, given the context of the subject matter (listen to it and you'll understand). Also it's worth noting that where Volume 1 contained a few drum loops and grooves, this CD is given over entirely to ambient textures.

It would be narrow-minded to assume that this CD is aimed purely at ambient or dance music producers, because I can see its sounds putting the frighteners on all sorts of audiences, not least of all in TV, radio and film. This is the kind of release that would make William S Burroughs run screaming for a nice cup of camomile tea and an episode of *Neighbours*. Paul Farrer

£ **£59.95 including VAT and UK p&p.**
A **Time & Space, PO Box 306, Berkhamstead, Herts HP4 3EP.**
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SYNTONIC GENERATOR
(DOUBLE AUDIO CD)

I know nothing about Sound Wave Applied Technologies, the producers of this CD, other than what I could divine from the sleeve — though it seems we're dealing with a North American outfit.
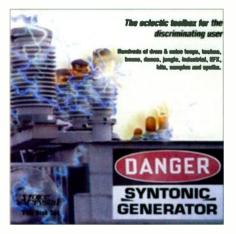
Disk 1's opening gambit is a selection of FX and noise loops, arranged at a frequency of around four per track. Keys, tempos and number of bars are shown as and where appropriate. To start with, noises are predominantly of the whooshy, gratey and/or burbly variety. 'Syntonic Generator' is the name of a particularly burbly example which, being considered a flagship sample, is presented here over six octaves. If this is the best noise on offer, we may be in trouble.

Thip sequences follow. These have probably been generated using synthesizers' random sample and hold facility, as per industry standard, though the quality of sound suggests something other than analogue. Ring modulation also features strongly. Loops are presented one per track, repeated at 120, 140, 160 and 180bpm. Bobbly, chirpy, squirty, grubbly, clinkity. Well, how would *you* describe sounds like these in print?

Now we're into big multisamples (half-octave intervals taken over six octaves) of

STAR STAND-UPS
STEVE COOGAN
BEN ELTON
JO BRAND
JIMMY TARBUCK
BERNARD MANNING

synths and keyboards, arranged as four sets per track. These seem to have been taken lock, stock and barrel from modern sample + synthesis instrument(s) — witness the looping on the piano samples. Some of the synth sounds are quite hard, but there's not much warmth in evidence.

Track 19 offers five bass sets. To start with, the quality of sound generation is as for the preceding synths, suggesting that the same instrument has been rolled out again. However, the last couple of sets sound more Minimoog-esque. Something suggests to me that the

The eclectic toolbox for the discriminating user
DANGER
SYNTONIC GENERATOR

artists who produced these samples don't really use them themselves: why else would they provide five octaves of bass samples taken at half-octave intervals? I'd rather have 50 different single bass sounds than five multisample sets in my armoury any time.

Track 20 kicks off the last section of this release, which spills over onto disk 2. We're talking drum loops, arranged anything from two to six per track. Each new loop is presented at three tempos — a relatively easy thing to do when the loops are all sequenced! Voices include beatbox, GM sounds, synths and sampled groove-noise, the latter incongruously laid over clean drums. Styles are labelled 'Industrial', 'House/Dance', 'Techno', and so on, though I would say that they generally fall somewhere between no-man's land and bland city.

It's rare that I'm not even tempted to boot up my trusty S770 while reviewing a sample CD for *SOS*. This is such an occasion. There is no place in today's hotly contested sample marketplace for a product which is so lacking in verve. Do yourself a big favour and stay away. *Wilf Smarties*

£ **£54.95 including VAT and p&p.**
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WRH

sound on stage

No matter whether you're a weekend warrior on the pub and club circuit or own a touring PA rig, each month SOUND ON STAGE magazine provides you with essential advice and info about all aspects of live performance — choosing and using PA systems, sound reinforcement mixers, guitar combos, microphones, cable wiring, choosing effects pedals and plenty more. Our practical tutorials offer no-nonsense advice on essential topics like running a PA and how to avoid feedback, plus the latest product news and major features that take you behind the scenes at top-billing gigs and stage musicals. *Have you got your copy?*

ISSUE 5
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Apple NOTES

After another panicky start to the year for the MacOS, MARTIN RUSS asks what happens next.

Now that Apple have weathered another shaky first few months of the year, it's probably time to look beyond the obituaries of the mass media and the reassurances of the specialist Mac press.

Probably the first question is 'What happens next?' Apple have gradually been refining their ideas about the likely course of MacOS development over the next couple of years, and the plan is beginning to take shape. It looks as though we can expect two parallel developments: six-monthly releases of

System 7.6, 7.7, 7.8 and so on, coupled with the gradual release of an entirely new and different Apple/NeXT Operating System called Rhapsody, starting some time early in 1998, with the major changeover of users to the new system happening by the middle to end of 1998. The System 7 increments are likely to last at least a couple of years, and represent the only route for 68K-based Macintoshes. PowerPC-based MacOS computers will be just one platform for the new OS, because it may well run on Intel-based PCs too.

Which brings us to the crunch. It now looks increasingly likely that Apple will gradually introduce more software that's intended for the Windows/Intel computer platform as well as their own. Claris' cross-platform packages, such as *Clarisworks* and *Filemaker 3.0*, are only a taster of the future. Depending on whose rumours you believe, Apple were due to release a PC clone early this year, mysteriously code-named the 3400 — or was it an even lower-cost

version of the 4400? Either way, Apple's attempts to make the PC go away have failed spectacularly, and it now seems that they've decided to take a more pragmatic approach — and it may involve hardware too. Microsoft have won the hearts and minds of most personal computer users, and the MacOS is likely to live on only in niches: publishing, multimedia, music, MIDI and audio.

The roots of the Mac come from a Xerox prototype called Star, and the roots of some of the distributed networking software used by newly acquired NeXT also come from Xerox. But, once seeded, the user interface of the MacOS seems to have become more or less fixed. A few improvements and a slight 3D appearance have been added in System 7, but otherwise the MacOS seems to be stuck in the 1980s. In contrast, Microsoft have continued to refine their Windows user interface, and the latest version, Windows 95, incorporates many neat and clever ideas from a variety of leading- ▶

NEWS IN BRIEF

• PRO TOOLS
Digidesign's major rework of the Pro Tools software (version 4.0) is due to be announced at the AES meeting in Munich about now. With PCI and NuBus hardware support, plus native PowerPC programming, it has a new visual appearance, new mix automation features and dynamic automation of TDM plug-in parameters.

• QUICKTIME MPEG
After a long, long gestation, the Apple QuickTime software MPEG decoder extension has finally made it out into the real world. Although hardware MPEG decoding is the best way of not thrashing your processing power just to get video onto the screen, the software MPEG decoder should finally give QuickTime the combination of cross-platform and cross-standard support it needs to be ubiquitous.

• MAX 3.5
Opcode Systems Inc have released a semi-major (3.0 to 3.5) upgrade to *MAX*, their graphical programming toolkit software for multimedia and music. Version

3.5 provides native Power PC code and some new and enhanced multimedia creation tools, including new support for the interaction of *MAX* users over the Internet (in addition to the *MAX* mailing list, of course!). One of the new objects is a graphical MIDI file editor which uses the piano-roll timeline approach to provide visual editing. Apple Notes eagerly awaits a review copy, to see if this new *MAX* overcomes the stability problems that have affected previous timeline-based objects.

Opcode also seem to be reinforcing the

multimedia aspects of *MAX* rather than just the musical appeal: *MAX 3.5* comes with Stat-Media's *Instant Buttons & Controls 2.0* CD which includes over a thousand graphical user interface images, so perhaps more people will consider producing kiosk and CD applications using *MAX* instead of *Director...*

Opcode are at http://www.opcode.com; to get onto the *MAX* mailing list, send an e-mail to listserv@vm1.mcgill.ca containing just the words 'SUBSCRIBE MAX'.

SMALLER SYSTEM

As part of the ongoing 'Make your System folder smaller and free up space for real work' series, this month's topic involves some of the less obvious space-wasters.

• **SOUNDS.** If you've ever played with anything that allows you to map silly sounds to key presses or disk ejects, or even alternative beeps, then you may well have quite a few sounds lurking in your System file. I bet that the initial novelty wore off quite quickly, and you soon returned to a quieter computer — but did you remove those sounds? Check by going into the System folder and double-clicking on the System file itself. After a pause, it should open and reveal all those sound files, plus lots of international keyboard definitions which are probably too small to bother about. Depending on what you used to produce all those sounds, you may well have a folder or two in the System folder full of nothing but sound files. This is a good time to move them somewhere else — onto a removable hard disk?

• **PATTERNS.** Desktop patterns are another area where it's all too easy to collect a large number of neat patterns, use just one of them and forget about all the other huge 24-bit graphics files that are occupying space and doing nothing constructive. Throwing away the Desktop Patterns control panel is a drastic solution — a much better one is to prune its contents by using the 'Cut' menu command.

• **ICONS.** Custom folder icons are another source of problems. Not because of the space they occupy, but because they can slow your MacOS computer down — the Finder can be kept very busy keeping track of all those custom icons for folders. There are Extensions that force the Finder to ignore custom folder icons, but a much simpler solution is to use them sparingly in the first place — use the colour Labels instead. Removing them is easy, but a little counter-intuitive. Use the 'Get Info' menu option or the Command-I shortcut, and then click on the folder icon in the 'About' dialogue box. Now 'Cut' it, 'Clear' it, or use the Command-X shortcut, and you should see the custom folder icon replaced with the plain, simple and ordinary icon.

edge user interfaces. The result is that Windows 95 looks modern and has a wealth of features, while the MacOS looks basically unchanged from 15 years ago.

With the desktop appearance of the forthcoming new Rhapsody MacOS due to incorporate some of the enhancements that were due for the now-abandoned Copland OS, as well as some of the advanced features of

> **"...we can expect to see a continuation of the gradual merging of MIDI, music and digital audio programs across the MacOS and PC platforms."**

OpenStep, NeXT's OS, Apple may well soon be challenging for the user interface lead again. But with many of Apple's best user interface designers now working for Microsoft, it should be an interesting contest.

MUSIC

So where does this leave musicians? Copland seemed to be working towards breaking the bad news that 68K Macs would be abandoned quite rapidly. Now the two-year respite for 68K

Macs means that those of us who are still reluctant to move to PowerPC have more time to put it off — but the end may be more traumatic. Perhaps the end of the 68K road will involve adopting the new Rhapsody OS and a PowerPC together in two years' time. For PowerPC users, the path looks much more like a repeat run of the remarkably smooth transition from System 6 to System 7, with a gradual transition over the next year or two.

Application-wise, we can expect to see a continuation of the gradual merging of MIDI, music and digital audio programs across the MacOS and PC platforms. The MacOS may well continue to show the way forward for musical applications: when you hear reports about Windows being unable to support more than 10 or 11 MIDI ports, you begin to appreciate the ongoing rivalry between Opcode's OMS (Open Music System) and MOTU's FreeMIDI, which has resulted in two powerful and very useful competing technologies working for the overall benefit of the MacOS MIDI musician.

The music programs themselves will probably continue to grow, and if other areas of software are anything to go by, we can expect a convergence of tools into complete integrated packages — rather like the Microsoft Office suite for business use. Third-party plug-ins, like those for Digidesign Pro Tools TDM, could well become adopted as a way of adding functionality when and where it's needed. Alternatively, OpenDoc's Java reworking may provide the same document-centric result from a different direction. The *Sound On Sound* of two

years hence may have a very different collection of computer notes pages...

SEND IN THE CLONES
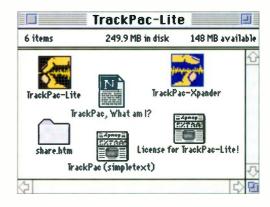
In *SOS*'s February issue I made the mistake of mentioning the new PowerMac 4400/160, and commented that this was Apple's boxiest Mac so far — which translates to 'most PC-like'. My recommendation that this might be a case when 'low cost is not necessarily a good reason to buy' may have been too Mac-centric. I've noticed that whenever I advise enquirers to buy a MacOS computer to do MIDI and digital audio, they come back several months later and tell me that they've just bought a PC instead.
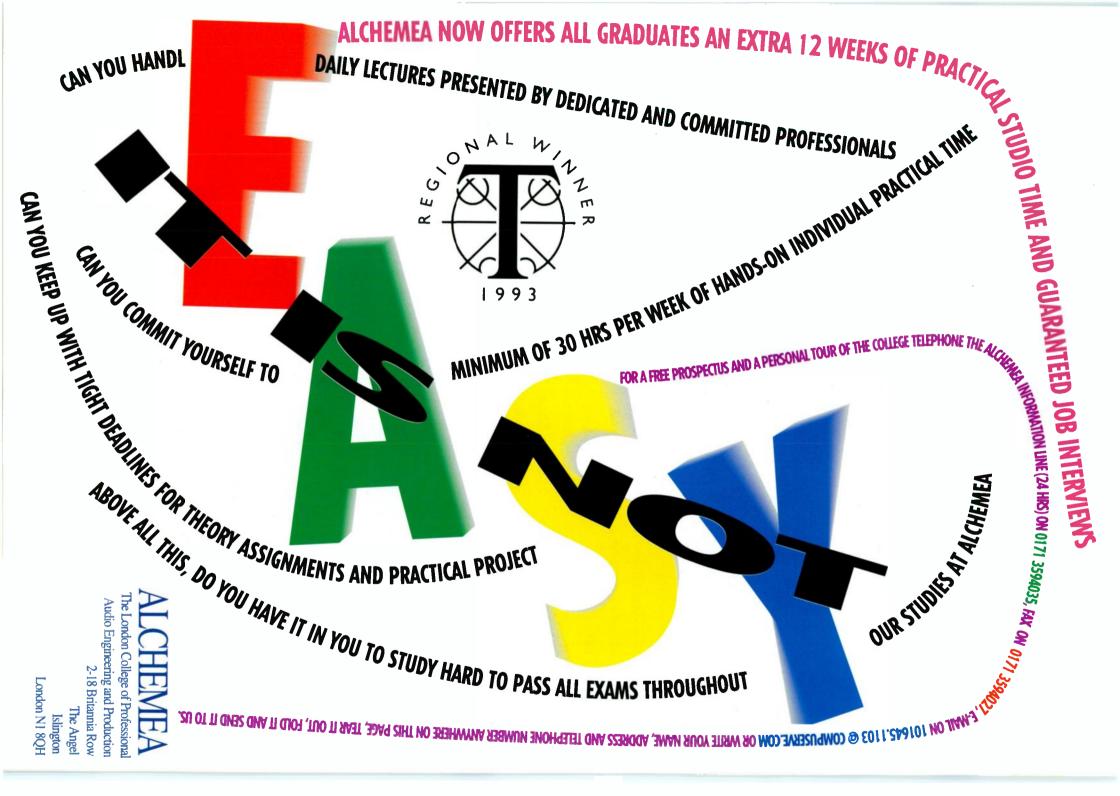
So, given the apparently rapid take-up of the PowerMac 4400, its three PCI slots, and the matching price reduction from competing clones, my tip this month is to buy the new, even faster, 200MHz PowerMac 4400 (or a similar clone). It will look so much like a PC that you may well buy it by mistake, so my advice to buy MacOS computers for music and MIDI may finally be heeded by accident. Go on, move that 68K Mac to one side (they make great Web browser and e-mail platforms) and buy a new PowerMac 4400 — most people will think it's a PC anyway!

ON THE NET

Waves are one of the leading companies making innovative plug-ins for Digidesign's ProTools, but here's a utility that has a wider application. *TrackPac* is a simple drag-and-drop audio utility for compressing audio files. It uses proprietary 'lossless' compression technology — which means that you get back exactly what you put in. File size reductions of 50% or more are claimed on on 16-bit sound, and 8-bit material should be squashed down to 20%-30% of the original file size.

TrackPac supports the widely used *Sound Designer II* (SDII) file format and does not require any additional hardware. (A WAV-file-format *TrackPac* is also available for Windows 95 and Windows NT.) A cut-down but still functional 'lite' freeware version of *TrackPac* is available on the Net, from http://www.waves.com **SOS**

music soluti
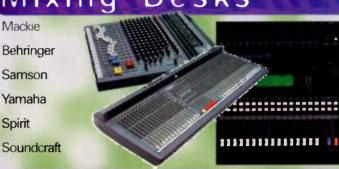
New Products

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Alesis Nano Compressor	£126
Nano Piano	£288
Nano Bass	£211
Nano Synth - Q56 sounds	£319
QSR - QS8 Sounds	£637
Point Sevens - Shielded Nearfield Monitor	£211
Spirit Absolute 4P - Power Monitor	£680
Akai S20 - Sampler	£424
Akai MPC2000 - Sequence/Sampler/Drum Machine	£1020
Alesis Studio 32 - 16 Channel, 4 Bus Desk	850
Digitech StudioQuad v.2 - More Presets/FX	£446
Yamaha REV 500	£339
Lexicon MPX1 -	£1020
Yamaha - ANIX - Virtual Analog	**Coming Soon**
Yamaha - A3000 - Sampler	**Phone**

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Behringer
Samson
Yamaha
Spirit
Soundcraft

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Alesis
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Behringer
Dbx
LA Audio
Aphex
Mutronics Mutator

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Akai DR16
Akai DR8
Akai DR 4 VR
Fostex DMT 8 VL
Fostex D-80
Fostex D-10
Fostex D-5
Tascam DA20
Tascam DA30
Roland VS880
Panasonic SV3800

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BRIAN HEYWOOD looks at two new enhanced versions of previously available PC software: SSEYO's Koan X, and Evolution's Sound Studio Pro Gold...

I've always fancied the idea of an automatic music generator: it turns you into a sort of bard leader, but you can tell the (electronic) musicians what to play without having to put up with any backchat, or buy them drinks. A little while ago I mentioned SSEYO's *Koan Pro* as a way of producing MIDI files. To recap, *Koan* allows you to create a music track by defining the overall characteristics of the piece and then letting the PC generate the actual notes. I won't go into any great detail, but you can think of *Koan* as letting you

generate instructions for a number of electronic musicians, with each individual musician playing their own particular melody line. This means that the music produced by Koan can be different each time it's played, as you can give each 'virtual musician' a certain amount of choice about the actual notes they play.

Brian Eno, who virtually invented the New Age and Ambient music styles, coined the term 'Generative Music' to describe this kind of music; in fact, he used *Koan Pro* to produce a recent work — called, not surprisingly, *Generative Music 1*. Eno described *Koan* as "the beginning of a new era in music"; it's certainly no toy, rather a serious and, above all, very sophisticated tool for creating music. My only reservation about the software is that, while it is quite easy to produce a pleasant piece of music, it's difficult to get your head around all the different parameters available in *Koan*. SSEYO's new software release — *Koan X* — goes a long way towards addressing this problem, as well as adding a few interesting bells and whistles.

Unlike *Koan Pro*, which provides detailed control of the internal workings of the *Koan* music engine, *Koan X* is more of a mixing and production tool, allowing you to take *Koan Pro* templates and define their stereo position, volume, instrument type and sound. You also have control over the musical behaviour of the icons, how they perform over time, and a number of options for producing output files.

Koan X has a simple drag-and-drop interface that allows you to select one template from a list and then drop it into a two-dimensional Mixing Window. The position of the template icons on this window determines the overall volume and pan position of the generated sound. Clicking on a template icon with the right mouse button lets you change the instrument sound, and mute, solo

or copy the template into the Windows clipboard (for pasting back into the same or other *Koan X* pieces). You can even make the templates drift around the Mixing Window, giving a constantly changing soundscape as the icons' volumes and pan positions change.

You also have basic control over the way each template icon in the Mixing Window behaves over time, using the Mix Window. This floating window has a row of boxes for each template icon in the Mixing Window; when a box is filled in, the icon will play at that time; if it's blank, the icon will be muted. The window has a indicator that shows where the current playback point is in relationship to the total length of the arrangement. Like the icon controls, this can be altered while *Koan X* is in Play mode, and any changes will take effect after a short processing delay.

The overall musicality of the *Koan* piece is controlled from the Music panel, which lets you change the underlying scale, scale mode and tempo of the piece. As all these controls operate in real time, they can be used to change the parameters governing the piece when it's playing back. This means that you can alter the feel of the music as it goes along, giving you overall performance control — like being the 'super' conductor of an electronic orchestra! For instance, you can make the playback sound 'sadder' by switching from a major to a minor mode, more
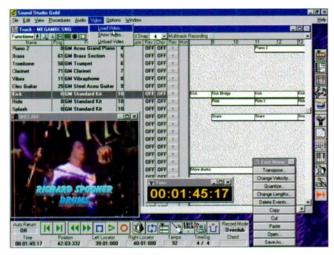
Koan X *allows you to drag and drop your way to Generative Music.*

frantic by upping the tempo, and so on. This performance control can also be used when you're 'printing' your *Koan* composition to a MIDI or WAV file — that's right, I said WAV file. One of the new features incorporated into *Koan X* is the ability to directly create audio files from within the application. This lets you incorporate any special features on your soundcard — such as the AWE32's Sound Fonts — into your final sound file, so that it can be played by anyone with an MPC soundboard. This is where the real-time control becomes very important, since any changes you make when recording is active will be incorporated into the final file. You can also use the native SKD and SKP files with the *Koan* players and web browser plug-in to take full advantage of the generative elements of the *Koan* music process.

Koan X is a particularly easy way of taking advantage of the *Koan* music creation process and should be tried by anyone who wants to see what's possible with the system. *Koan Pro* users can also take advantage of the intuitive interface of the new software, by creating 'seed' templates on their editing package and using *Koan X* to mix them. *Koan Pro* owners won't be able to use the new features until SSEYO release a new version of *Pro* software. However, when this happens you'll be able to swap SKD files between both applications, allowing you to generate new templates in *Pro*, construct your piece in *X* and then use *Pro* to tweak the final music file. *Koan X* comes in three versions: Silver (which is essentially available as shareware), Gold (£16 inc VAT) and Platinum (£33 inc VAT). The Silver version is also available for download from SSEYO's web site (http://www.sseyo.com); the other two versions can be purchased on-line using Uunet Pipex's secure credit card transaction service (The Bureau).

EVOLUTION PRO GOLD

Leighton Buzzard-based Evolution Electronics have just released the latest addition to their range of MIDI and audio sequencers. The new product is called *Sound Studio Pro Gold* and brings all the different elements of PC-based audio technology together into one comprehensive music package. You can record and play up to 256 tracks of MIDI and up to 16 tracks of stereo digital audio, and auto-accompaniment, chord recognition, score display and

Evolution's Sound Studio Gold *lets you sync your music to video, in the form of an AVI file.*

printing, and a host of other features are also on offer. One interesting feature is the program's ability to load in any AVI file and play back the audio and MIDI tracks in sync with the picture. This makes it a good choice for developing soundtracks for video, either AVI multimedia or traditional tape-based video — AVI playback is far more responsive than sync'ing to a timecoded video tape, since the AVI doesn't need to wait for the timecode to settle — typically, this takes one to two seconds — when playback begins. The package is fairly cheap as well, with a recommended retail price of £150 (inc VAT). You can contact Evolution on 01525 372621, email them on sales@evolution.co.uk or check out their web site at http://www.evolution.co.uk

Atari NOTES
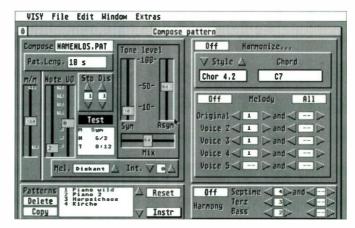
The Atari ST is more than 10 years old, but its high suitability for music and the enthusiastic support of users means that it's still going strong. DEREK JOHNSON takes a look at some current software, reflects on some older software available at bargain second-hand prices, and reveals those all-important Atari Show dates.

ast month's mention of *M*, the algorithmic composition software for Macintosh, in our Crosstalk pages, reminded me that the software was also available for Atari ST at one time. This is no longer the case, but the adventurous amongst you who would like to explore this kind of software on the ST do have a choice: I recently found (on Compuserve's Atari forum) a demo of a package called *Virtual Symphony*, from German company Galactic. *VISY* is an interactive composing program for all STs (with 1Mb RAM or greater); interactive, in this case, means that you can alter any parameter during playback until you find a combination that fits your needs. Initially, the results can be pretty chaotic, but a couple of demo files illustrate what can be achieved. The retail price, as of the version I downloaded, is DM600 (which translates to US$350 or £210). Contact Galactic (Klarastr. 33, 45130 Essen, Germany, Tel/Fax 0049 201 27 32 90, email

Virtual Symphony main screen.

100720.1344 @compuserve.com) for up-to-date details. Obviously, you can locate a demo copy of *Virtual Symphony* on CompuServe's Atari forum, but it can also be found at http://www.keys.de/ftpout/cdtos.html.

The same web site turned up two other neat bits of software: *JV1080ED* comes from Hungary's Attila Mezei, and offers basic but useful editing features for the Roland JV1080 module. One patch can be edited at a time, and sent to the module or stored to disk — no librarian features yet. However, the software is designated 'patchware': if, after downloading it, you like it, you just have to send Attila some of the patches that you create with the software.

I found another rather useful piece of software (too late to cite in this month's Crosstalk, where a reader's letter asks about Atari software for use with the S330): a Roland S330 editor. Unfortunately the documentation for this is all in German, but luckily it has a fairly straightforward

front end: you can load Patches and Tones from the S330, save Tones to ST disk (or hard disk), and edit names and loops on the computer, before beaming them back to the S330. This package is shareware, so if you use it make sure the author (Ingo Debus) knows about it.

REMEMBRANCE OF SOFTWARE PAST...

The Atari ST as a platform is well over 10 years old now. In fact, if it were a synth, it would probably be due a place in *SOS*'s RetroZone series! Many pieces of Atari soft and hardware have come and gone over the years, disappearing in a haze of support-free *ennui* due to the platform itself lacking the backing of its manufacturer. One such package, which has made a few appearances in the *SOS* Free Ads lately, is Steinberg's *Avalon*. This package can be made up of a maximum of three parts: the sample-editing software, the 16-bit D/A monitoring cartridge, and the SCSI/DMA controller box for sample transfer via SCSI, if your sampler supports it. The most common configuration is software and monitoring cartridge only, which typically had a price of around £600 in its heyday (*SOS* reviewed v2.0 back in December 1991); recent sightings have been at a rather more user-friendly £195 and £295. The only downside is that sampling has to be done on your sampler and transferred to the Atari for editing, although this means that your sample quality is as good as the converters in your sampler. *Avalon* offers superb editing and synthesis facilities, and provides dedicated support for a wide range of samplers; such facilities make *Avalon* more comparable to Digidesign's *Sound Designer* (which was also an Atari product in its earlier versions) than to, for example, Microdeal's *Replay 16* package, which is extremely good value for money, but not as sophisticated.

Magic Carpet rides again

RECORDING A '90S ALBUM WITH A '70S ETHOS

'70s band Magic Carpet waited 25 years to release a follow-up to their 1972 debut album — and '90s technology enabled them to do it all at home this time around. ALISHA SUFIT, who played, sang and engineered the sessions, explains how it all happened...

Alisha Sufit.

Magic Carpet were a '70s phenomenon created by sitarist, Clem Alford, guitarist Jim Moyes and tabla player Keshav Sathe, fusing Western and Indian contemporary music to form what some referred to as Psych Prog Folk. The three took their sound to Mushroom Records and were offered a recording contract — as long as they found a singer.

That's where I came in. I'd met Jim Moyes at art school, and he knew of my singing and songwriting. The trio became a foursome, making an eponymous debut album in the winter of 1971/72, but the band lasted less than a year, doing a few prestigious gigs, an occasional festival and some radio. Then we split, thinking no more of it.

Until a couple of years ago, that is, when I bumped into an ex-fellow busker and was stunned to hear that the album we had made so long before was now an internationally-collectable cult LP, selling for as much as £120 for an original copy! Perhaps it was time to get the band together again for a chat...

The members of Magic Carpet hadn't seen each other for a while, and I later discovered that a quasi-bootlegger, with two of his cronies, had paid Clem a visit, kindly telling him that I was dead, perhaps with some evil plan to obtain the rights to the record! Very soon, however, the re-issue was out on legitimate CD and mini-fame was ours. It wasn't long before we started to receive a bit of fan mail — there were people out there who really liked the old sounds. Soon people began to ask if we would get back together. We met up again and, although Kesh had decided to retire, Clem and I, who were playing professionally and doing our own thing, thought it seemed like a natural step to do another album. We decided to do the rush follow-up, 25 years on, to be called *Once Moor* (*Magic Carpet II*), and I would bring it out on the aptly named Magic Carpet Records label. Great, but how would we record the new album?

HOME WORK

My good friend Andy Fernbach, of Jacob's Studio, had offered us a really good deal to record down in Surrey, but the Neve desk and vast array of sophisticated gear was far more than we needed for a simple acoustic line-up, and the extra costs could prove inhibiting. I began to investigate the possibilities of DIY recording. After much research, I was seduced by the expertise and support offered by Music Lab, and I was delighted when they delivered the goodies I'd purchased and set them up. They showed me how to plug the looms into the compact Allen & Heath GS1 desk, and attached the myriad umbilicals to the spanking new Alesis ADAT 8-track recorder. I already had an Alesis Microverb III, which was promptly connected. Included in the Music Lab deal was an AKG C3000 microphone, and I would also make use of the AKG C1000S I already possessed.

Being a good girl, I sat down and read the instructions. The manual for the ADAT was very easy to understand, and the boffins at Allen & Heath soon got used to the occasional cranky telephone query from London. The album would mostly consist of songs, so the first thing was to record the guitar and the appalachian dulcimer backing tracks, the washing-lines upon which most of the rest would hang. Track 8 on the tape was designated to record the electronic metronome click track.

I had years of experience as a musician recording in studios, so I'd probably picked up more information than I realised, but I read the documentation that came with the mics nevertheless. Placing the C3000 approximately 10 inches above the sound holes, I gave myself plenty of time to record the instruments, punching in and out with a foot switch where necessary. I soon got used to keeping an eye on the levels, getting as close to red as possible without clipping into it.

An engineer had once told me that the best way to put down acoustic instruments, especially the ▶

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WRH

Magic Carpet

ALISHA SUFIT

alisha through the looking-glass

▶ voice, was to record everything flat, and only to add EQ and effects later. I had plenty of painted canvases on the walls, and carpet on the floor, to soak up any stray, renegade room echo, and I would also draw the window curtains of my attic recording venue.

Over the years I had learnt a little about recording the voice. I rigged up a pop shield, using a bent wire coathanger covered with an old nylon stocking, and attached it to a stand set up between me and the mic. This dampened any sharp consonants, also shielding the mic from breath noise. I didn't want to use any compression at the recording stage, so I was very vigilant about pulling away from the mic on louder passages, and coming in closer for quiet ones. I paid a lot of attention to diction, because I wanted to ensure that vocal intelligibility wasn't lost later, when effects such as reverb were added.

Later on, I found I wasn't entirely happy with some of the instrumental backing tracks, so I tried recording the voice and guitar together. There was an inevitable loss of separation between voice and instrument, but I had captured the general feeling of spontaneity that I wanted. The good thing about not having to pay for studio time (when money's tight) is that you can start and stop whenever you want, walk round the garden, generally recharge your batteries. The ebb and flow of home recording is far more creative and natural than studio recording, for me.

ETHNIC MAGIC

With the basic instrumental parts down and the vocals in the bag, it was time for Clem, the sitar and tamboura player, to come over. The sitar and tamboura, the latter a sort of four-stringed continuo, are played with the musician seated on the floor and, as I had done with the guitar and dulcimer, I placed the C3000 roughly 10 inches away, just in front of Clem's right hand. We both listened to the existing recorded tracks through headphones, and I would drop Clem in as required.

Clem and I had decided to collaborate on one track, and for this we both sat down and played together. Clem chose a particular scale and I worked out a guitar backing that would allow him to improvise. We miked the instruments up as before and jumped in while the ideas were fresh. Soon we had our album's title track, 'Once Moor', and it just remained for Clem to add some eccentric Indo/Scottish vocals to complete the piece.

Now it was the turn of Pandit Dinesh, on tabla, to join us in the attic. Old engineers would turn in their graves at the idea of adding percussion last, but it worked. The Indian tabla consists of two separate drums, so I placed two mics about a foot above each and routed the two signals onto one track. We listened to the results at every stage through an ancient pair of Kef Cadenza speakers.

The *Once Moor* album was planned for release on vinyl and CD, and we had decided on a classical raga as the bonus track for the latter, to bring the running time to slightly more than 60 minutes. This slot gave Clem a platform for his excellent classical sitar playing, and the brilliant Esmail Sheikh was invited to play tabla accompaniment. My job would be to record, sympathetically, the purity of the acoustic sound, with the least interference possible. This classical raga would last approximately 20 minutes, so everyone in the house was asked to be as quiet as mice, because there's no punching in or out with such a piece of music. I miked up the instruments in my usual way and tested for levels, asking the players to demonstrate their loudest sounds. As the piece progressed, the playing grew in volume and I found myself pulling back the faders time and again. We were lucky that the changes in level were not noticeable later, and that the trips into the 'red' were too short to register as distortion.
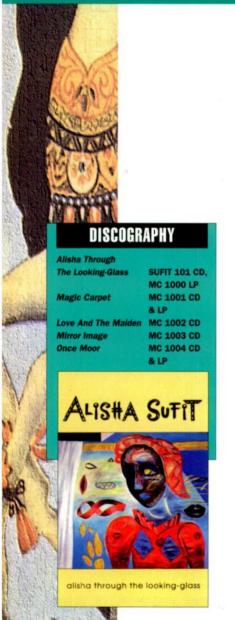
Finally, the last touches to the recordings were made, with the addition of lead guitar on some of the songs, plus embellishment with vocal harmonies.

MIXED FEELINGS

The unmixed mastering of the album was done, and I now felt it was time to avail myself of some expertise for the final mix. I had been told that the GS1 and the Microverb III were not up to the job, and also that I would need compression for my unruly voice. I knew an excellent and amenable professional engineer and he said he would be able to help me out, so I set off to see him with my ADAT tapes. On reflection, though, I hadn't done enough homework on the production side, and I was still pondering various editorial decisions, all the while cooped up in a well-endowed but suffocatingly hot and cramped little studio, vastly different to the cool space of Alisha's attic! The mix was somewhat hurried, with the drawback that the engineer had never before heard the unmixed masters, but I was well enough pleased when I took my one-off DAT tape back to London.

The next move was a visit to Denis Blackham, master of the pre-production stage, so I drove off to Surrey to see him. Imagine my horror when the one-and-only final mix on DAT began intermittently screeching on Denis' machine. Denis told me that the only hope of getting the tape to play back properly was to use the machine it had been recorded on. There was nothing more we could do that day — but then he spied a rough mix I had done myself, and he asked to hear it. Before I left, he quietly let me know he preferred the overall sound of the 'rough'.

I went back to London biting my nails, but again I decided to try doing it myself. I had nothing to lose. Using the GS1 desk, I spent the next two weeks experimenting, mixing down onto a simple Sony DTC690 DAT machine. Having driven myself half mad exploring the sound of sound, the general consensus of opinion was that I should use my own master tape, despite the rudimentary equipment I'd used. Again, I had

WRH

worked with no pressure and no hassles about finance or differences of opinion. If something didn't sound good two days after I'd done it, I did it again, alternately listening through AKG K270 headphones and through the old Kef Cadenza speakers. I achieved space by moderately panning the instruments left or right, mostly leaving the voice or lead instrument centred. I also used only a moderate amount of reverb. I didn't want to lose the intimacy or clarity of the lyrics. The Microverb III provided a modest dose of 'Large Hall', and I only tinkered with the EQ when I wanted distinction for the voice, sometimes increasing the top end very marginally. When I went back down to see Denis he was very supportive of the results. He added a little graceful compression, only where absolutely essential, and I ended up with a pre-master I was happy with, on Exabyte.

ART ATTACK

The final hurdle was still to come. I decided to do all the artwork for the album myself, so I bought a two-year old Apple Mac. Some weeks later the booklet and the sleeve were complete. I had been able to fiddle around to my heart's content, experimenting with fonts and pictures without that awful 'this-is-costing-£60-an-hour' feeling.

Then it was time to visit the charming James Parish at A to Z Music Services in Camden Town, and two weeks later I was beaming at the result. The pressing plant chosen to do the CD has never put a foot wrong in my experience, and the booklet and sleeve printing were excellent. EMI, after diligently ironing out some inevitable naughty little vinyl problems, are still probably the best producers of records in the country, their discs being almost as free of background noise as CDs, but with that extra vinyl warmth of sound.

It all seemed worth it when I got the first fax from Japan. I had sent out a sample CD and back came the response: "It is very fantastic sounds, I think. We would like to order" — just what every hard-working Crouch End record impresario likes to hear! SOS

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demo DOCTOR

If you'd like our resident specialist JOHN HARRIS to review your demo tape, just send it on cassette or DAT, with recording details and a photograph, to: Demo Doctor, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ

THE FANTASY OPTION

Recording Venue: Home
Recording Equipment: Sansui 6-track cassette multitracker, Digitech TSR12 effects, Yamaha FX500 effects, AKG C1000 mic.
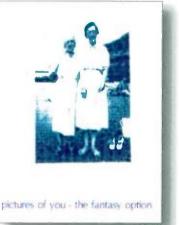
The DI'd sound of an acoustic kicks off this demo from St Helens-based The Fantasy Option. Its thin and brittle sound doesn't sit well with the rest of the backing — a bass guitar, drum-machine percussion and vocals in the verses. Because of the lack of body in the guitar sound, there's no lower-mid warmth in the sound of the mix. If I'm mistaken and the Tanglewood guitar was actually miked up, then the signal from the AKG C1000 has been equalised heavily to achieve this sound. The vocals are also thin on this song and I know that the microphone is capable of better than this. Again, it could be a case of too much EQ, or perhaps the singers were just too far from the microphone when they did the take and lost the extra warmth afforded by the proximity to a unidirectional microphone.

Unfortunately, the second song suffers from the same problems with the

pictures of you - the fantasy option

guitar sound, although this time I think it's an electric guitar. So this is definitely an area for improvement: you could start by miking up an amp instead of DI'ing the guitar. The bass and drums work well together, with David Jones on bass sticking well to the programmed Alesis SR16 drum machine. But there's a hefty slice of plagiarism in the songwriting department — I think nearly everyone has seen the Blues Brothers movie by now!

The best thing about this tape is the performance energy, which manages to come across in spite of the lack of recording expertise. I also think that it would sound a lot better with a real drummer, but I understand the limitations of home recording when it comes to recording real drums. Nevertheless it's encouraging that the band recognise this too; they use a real drummer when playing live. ❑

MACHINE CODES

Recording Venue: Home
Recording Equipment: Mackie 1604 desk, Atari Falcon 030 (16Mb with 100Mb HD) running Composer's Desktop Project software and Logic Audio 2.5, SCI Studio 440 sampling sequencer, Casio DA R100 DAT, Alesis Microverb effects processor.

In the last review I gave of Mike Dred and Peter Green, the men behind the Machine Codes name, I said that I'd have given them a longer review if they'd included some recording details. The new 2-track demo does feature such details — so here's the upgraded review!

I called the last tracks a demanding listening experience, and 'Nautilus 110' carries on from where they left off, but with areas of accessibility to the casual listener when the beat breaks through. However, this is not what Dred and Green's merging of electro acoustic and industrial techno is all about — it's more art house than accessible, and extremely well produced at that. Every sound is well constructed and utilised, whether it's a ripple, scrape, crunch, clang, rattle or creak! Interest is also kept and held by the seamless movement from one mechanical scenario to another, and the lack of repetition — Machine
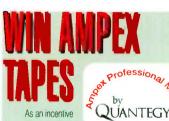
Codes is indeed an apt name.

Sonically the tracks never fail to interest, but the mixes are also excellent, with wide stereo imaging, fat, powerful bass sounds that don't run the risk of rumble, and good choice of effects. Dred and Green are obviously fond of short delay and reverb times with a high feedback, which yield the metallic frequencies to enhance their choice of samples and synthesized sounds (provided by a Roland JD800 and a Korg MS20). There's also an interesting use of backward samples on the second composition, 'Grrearra Falcon', which is reminiscent of parts of the second Robocop movie soundtrack. Impressively, the production never grates, as so many rasping and harsh sounds could do in the wrong hands — many demos attempt an industrial soundscape but end up impossible to listen to because the upper-mid frequencies are too sharp and distorted. So, a good demo which is bound to be the source of many a sample when released on CD! ❑

EPIC VOICE
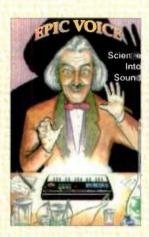
Here's a demo from a duo who write dance music and actually go out and gig it. So far they're confined to the South West, with appearances at the Warehouse and the Sound Factory in Plymouth under their belts, but they are looking to travel further afield.

From the opening track, the music is accessible: there's even a keyboard solo! If I was being unkind I'd say that this is the sort of music Spirogyra might have produced if they were trying to write dance music; fortunately, programmers and performers Andrew Dingley and Jono Grant make amends with their second offering — a fine slice of dance which slaps you in the face and has its subtle moments too. The pace is a fast shuffle with a hard dry kick that's nice and loud in the mix; filter-modulated sequenced loops ride on top of it. The occasional vocal sample is placed low in the mix — quite tantalisingly so — and the touch of ambience on the sample, whether added by the duo or part of the original sample, is just right.

It's a hard kick drum again for the third track, with a synth pitch-drop in there to pin the mix down. A feature of the mixes is the wide stereo, demonstrated here by the repetition on the looped triplet synth and fat strings backdrop. The break where the slow-attack strings pulse and play off a slow-attack vocal sound, question-and-answer style, works really well and is reprised later with the beat behind it.

All the mixes are well balanced and the arrangements well conceived. If there's a criticism at all it could be that the sound lacks balls — this could be in the bass synth area where the sounds seem to lack weight. Still, I haven't had the benefit of hearing this through a big system as Andrew and Jono obviously have, live. Speaking of which, if you're into what others have described as progressive, intelligent music, check out the clubs in the South West if you want to catch Epic Voice in action. ❏
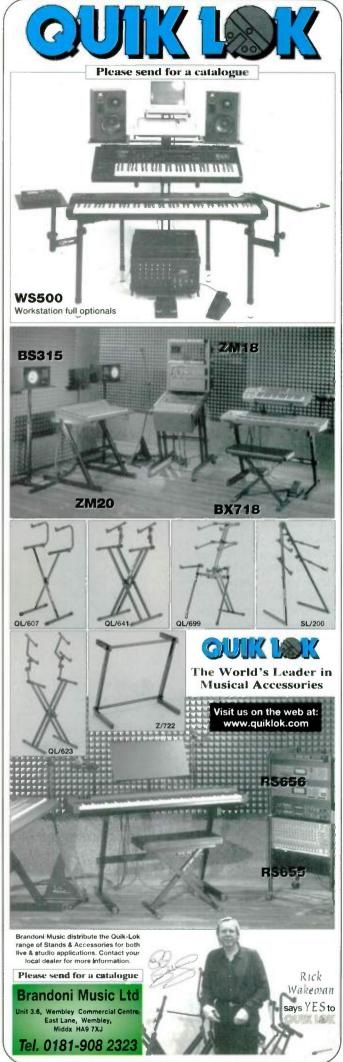
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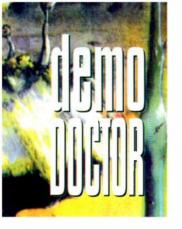
FREI ZINGER: Frei Zinger should be well known to the shoppers of Oxford where he is a familiar sight busking on the streets. This CD was recorded live in a single session at Merton College Chapel by Tim Turan, a fellow member of the group Aquabats, who featured in these pages some time back. Basically Frei improvises, using echo for rhythmic and spatial effects in compositions that last about 15 minutes each. The sound is relaxing and ideal for creating the kind of New Age
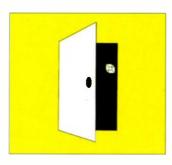
ambience that goes well with massage and meditation. A perfect example of his style is the composition 'Yearnin'', which starts with a melodic theme and moves on to explore and improvise from that point. This track also features a lower two-note loop which is probably the flute again, locked in a digital delay and providing a hypnotic anchor point to the piece. The recording is clear, with none of the problems that can be associated with flute, such as too much presence and breathiness. Occasionally it sounds as if the effects unit is close to overload on some of the more prominent notes, but the sound never actually breaks up to spoil things.

LIMBO PHONIC: It is perhaps unfair to review the musicians on this CD in a demo column. Both Frank Burke and George Cassidy have worked with Marcia Bednave of EMI dance act Rio and Mars and Sharon Gitau of MTV's *The Real World*. The album is described as an ambient project, featuring a mixture of technology and guitar, but as no recording details were supplied I can only assume that this is intended for commercial release. The overall sound of the opening track 'Morphia' is quite small and tightly mixed, and I can't help feeling that a little more reverb on the upper mid synth parts wouldn't

have been out of place, to widen the stereo image. 'Cybersex' was another track that was recommended by the band for appraisal and this sees them move away from ambient towards Drum 'n' Bass. Tight, in-tempo delay increases the detail on the rhythm track without making it fussy, and the female samples are well chosen — especially the humorous 'Do you like that?' at the end. Surprisingly, Limbo Phonic show another side to their character with 'Theme For An Italian Film'. This fairly typical slow acoustic guitar and keyboard composition suits the title. The guitars are a bit on the bright side for my taste early in the track, but work perfectly against the fat low-mids of the strings when they join in. And when the guitars play the theme mandolin-style — well it's ice creams all round!
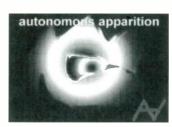
NEIL BAKER: Neil Baker's 2-track CD was recorded at Waterhouse Studios in London and mixed by Simon Wring, whom I presume is the house engineer. Compared with most commercial CDs, this one's level is low and could probably have been

improved by some quality compression, allowing it to be mastered at a higher level without problems with peak signals. The mix is bass-heavy with too much prominence given to the dry, close-miked bass drum. I think a little room ambience, or a touch of some of the reverb used on the snare, would have been nice. The kick drum also sticks out occasionally where it's been over-accented. It's often quite a surprise to find that you have to modify your playing dynamics for the studio, yet this could have been dealt with here by compressing the kick drum on the mix. The general sound of the mix is also lacking some presence and this could be improved if you ran it through an enhancer in post production. Musically, the jazz-

funk sound of the band is tight with some sympathetic singing from Karen Black over a groove backing from Martin Cooke on basses and drums and Neil himself providing some tasty guitar playing.

AUTONOMOUS APPARITION: Kevin Parkes' demo is recorded using a PC with a Soundblaster AWE32 soundcard and 2Mb RAM, sequenced using *Cakewalk* software. The sound is clear but fairly sterile, as you'd expect with such a system — or could it just be the choice of sounds? Everything is

in place in the mix, and the balance is decent enough, if verging on bass-heavy in places. Yet the drum sounds are hard in the lower mid area, with the exception of the hi-hat sounds, which are thin and wispy. The frequency hole in the middle is not really filled by the strings — which a good dose of cut at 800Hz would have warmed up a treat. Matters improve on the second mix but the sounds still need to be messed up more — using some good old outboard phase and flange — for a more pro-sounding track. On the up side this second track has better and more interesting sounds. I especially liked the break with the sound loop falling in pitch in the background, and the bass is at a better level too; by the third track, 'Cocomo', Kevin has got it sussed.

HIRÓ: Definitely the first tape I've received from a Japanese female singer living in Manchester. The production on the first song is a little crunchy and the microphone 'of unknown origin' doesn't really do the singing any justice. As far as the instrumentation is concerned, the upper-mid sounds are a little

thin and buzzy and would probably have benefited from a lower filter setting. Even so, the slow sweep flanging with, I imagine, the speed set at minimum and a wide depth really does work well on the single-note looped synth part. The first song took a while to get going: for a demo, it would probably have had more impact if the groove came in earlier. The good news is that the second track works a lot better, with the more mellow waveforms of the CZ3000 used to good effect on the loops. With fellow writer Jon Can singing harmonies along with Hiró on a chorus section, the track has a Euro feel that I quite liked. However, the singing is otherwise fairly sparse so the track never loses sight of its dance-mix roots; Hiró's voice is used effectively with echo at various points on the mix.

LOVE X AND Y: Describing themselves as a chaotic pop cocktail mixing Roxy Music with Radiohead gives this band quite a lot to live up to. The monophonic synth punctuation of Os (occasionally featured in these pages himself) is in keeping with Eno's touches in early Roxy and the effects are also well used, particularly the flanging sweep on the beginning of the second track, 'When It's Over'. Surprisingly, the title track of the CD, 'Tarantino', doesn't grab me in the same way

as the inventive and slightly pomp-rock work out of this second song does. Perhaps it's the raw sound of the Manzanera-style guitar, which is mixed to the front and exceptionally well conceived within the context of this band. My only disappointment was the level of the vocals in the mixes of the first two songs — I was struggling to hear them — and the general sound of the production. Nothing a good wide-band valve EQ couldn't sort out, and London-based love X and Y are well placed to hire something like a TLA EQ to cut about 3dB out at 1kHz and maybe add some presence at 12kHz. Otherwise excellent. ⏋

Endangered species

CHEETAH MD16 DRUM MACHINE

The best drum machine ever? Staunch admirer NICHOLAS ROWLAND leaps to the defence of the long-neglected Cheetah MD16.

O n paper, it had everything going for it — excellent sounds, an unbelievably competitive price tag, and a staggeringly comprehensive programming system that enabled anyone with an ounce of rhythmic sensibility to squeeze out those creative juices until the pips squeaked. In short, the Cheetah MD16 was the best drum machine ever produced for its price. With a couple of pints inside me, I'd even argue that it was the best produced for any price (yes, I'm that sad). But Fate, cruel mistress that she is, has allowed the MD16 to be buried in the sands of time.

BLIGHT OF BRITAIN

If you've never clapped eyes on one, or even heard of it before, don't worry, you're in the majority. Maybe it was just too cheap — so it was never taken seriously. Maybe it was too flexible — and therefore thought to be too complicated. Maybe, even, it was too British. After all, it wasn't too long ago that 'Built in Blighty' was generally perceived to stand for erratic quality control and an inability to last much beyond the statutory guarantee. Certainly, the MD16 looked a bit rough and ready when set alongside the slicker, more rounded products from the land of the rising yen. But, even though the looks couldn't kill, the internal gubbins should have been enough to ensure the MD16 a place in the canon of mass murderers.

But before learning about the MD16 from one who's proud to have owned two, let's check out its family background. This can be traced back to granddaddy SpecDrum, a software program for the Sinclair Spectrum. (This was back in the mid-1980s, the days when Cheetah were known a lot for their computer joysticks and a bit for their MIDI controller keyboards.) The program revolved round a grid-based programming system and involved loading in the drum samples off tape. It was actually pretty nifty, although, with the days of the Spectrum already passed, it was never going to generate a mass following. In 1988, Cheetah hit the market with a hardware derivative — the MD8.
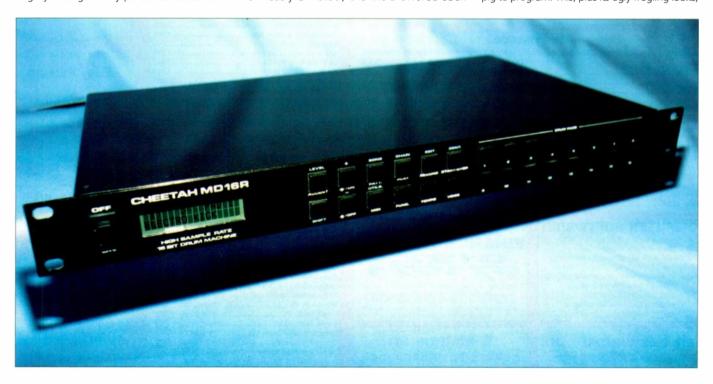
UGLY SISTER

This unprepossessing unit, looking somewhat like a brick with one frog eye, was a bit of monster in its own quiet way, with a list of features that simply knocked the spots off anything else in the price range. Weighing in at a measly £149.99, the MD8 offered such luxuries as programmable tempo changes and dynamics, a comprehensive MIDI spec, and four individual outs plus additional mono and stereo sockets, as well as the ability to sync to tape. Cheetah also produced an inexpensive interface which allowed the sounds to be played via drum pads (including Cheetah's own budget electronic kit) and also act as a trigger to a MIDI interface. Admittedly, the complement of a mere eight voices and 4-part polyphony might seem a little laughable to a modern world currently awash with ROM and RAM, but the MD8 at least enabled the loading of new samples into its 60K memory. These came on cassette, as the SpecDrum's had — although, if you possessed the appropriate gear, you could save and subsequently reload them in something akin to MIDI sample dump format, which at least overcame the problem of corrupted tapes. (Backups? What backups?)

The sounds themselves were pure grit. The crash and ride cymbals cut off with an abruptness that bordered on impertinence, though today's trip-hoppers would probably see this casual disregard for realism as a major selling point. The electro kit (one of the optional voice tapes) was blessed with truly stonking kick, snare and tom, and these pounded their way through many of my demos at the time. Listening back, I'm surprised at how keenly they cut through the mix without the aid of FX processing, EQ treatment or safety net.

The only problem was that the MD8 was a pig to program. This, plus its ugly frogling looks,

did it no favours as it vied for the punter's pound among all the other gear on the music store shelves. Despite the fact that the MD8 was a veritable bargain, I'd be surprised if it ever sold in large numbers. But it was an interesting precursor of what was to come.

FROM FROG TO PRINCESS

And what did come was the MD16, an altogether slicker-looking cat which was first sighted at the Frankfurt Music Fair in Spring 1990. With a price tag of £299, it certainly carried on Cheetah's tradition of affordability. However, the world and his wife seemed to be producing budget drum machines like crazy at this point: when the MD16 finally emerged, it was up against stiff competition from the likes of the Alesis HR16 and Roland R5. Aside from the desktop model, Cheetah produced two rack-mounting versions, codenamed MD16R and MD16RP. The P in the latter model denoted a doubling of the unit's case to 2U size,

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an increase of £100 on the price... oh, and the addition of eight extra sockets on the front panel to accommodate trigger inputs from electronic pads, microphones or tape signals.

All the Cheetah machines boasted 16-bit 44kHz samples at a time when 16-bit sounds sampled at 44kHz were rare enough on budget equipment to be something to boast about. The 41 basic sounds comprised five kick drums, six snares, five toms, four hi-hats, three cymbals, 17 percussion sounds (including such oddities as temple blocks, tabla and acid flick) and a very much in-yer-face sampled slap-guitar bass. The recording quality is excellent, while character-wise there's a punchiness and presence about most of the sounds which means that they lend themselves quite naturally to dance and electronic music — as is demonstrated by the generous helping of demo programs, which includes some ground-shaking dance, techno and hip-hop beats. Cheetah machines would have appeared disappointing when set head-to-head against machines like the Alesis SR16, though, because none of them had any ambience recorded as part of the sample. Remember that big gated snares were still in vogue at this time and decent budget reverbs were not quite falling out of cornflakes packets as they do now. So if creating an instant Phil Collins sound-alike was your heart's desire, the Cheetah would have been regarded as somewhat thin and balding. *[I feel there's a joke in there somewhere — Ed.]*

Like the MD8, the MD16 had extra sound sets available — but ▶

this time they were housed in sturdy cartridges which plugged into the back of the main machine via an RS232 interface. I'm not sure how many cartridges were ever produced, but among my collection are one containing a more than passable set of TR808/909 samples plus electro drum and cymbal samples and a useful analogue-style bass sound; another with a feast of extra kicks and snares; and a third with a range of African and Latin hand-held and tuned percussion sounds (including a set of conga sounds — probably the worst omission from the standard set). Again, the quality across the board is excellent — you'd be hard put to find a duff one among them.

Good as the MD16's sounds are in their native form, one area where this machine really scores is in its extensive sound-shaping abilities. Voices can be tuned over a +1 to -6 octave range, or chromatically over a ±1 octave range in semitone steps. A chromatic function allows you to spread a sound across 16 buttons to create an ersatz keyboard for playing tuned percussion or bass lines. Also programmable is the direction of play (forward or reverse, or indeed forward followed by reverse), sound length, velocity curve, volume envelope, and pan position. These facilities enable you to create a huge range of variations using the basic samples, though in practice you can only ever have 128 edited versions of the sound in memory at the one time, organised in two banks of 64 sounds, arranged in four levels. Still, when was the last time you ever needed more than 128 sounds in a drum pattern? The MD16 also allows 32 of these to be multiple sounds, with up to three samples assigned to the same key. These can be programmed so that you hear different mixes of the sounds according to MIDI velocity (or physical velocity if you're

programming the desktop version of the MD16, since this has pressure-sensitive pads).

Tuning, sample length, attack and start point can all be made velocity-dependent, the philosophy behind this being that by carefully tweaking each parameter, you can recreate the subtle nuances and minor imperfections that are characteristic of real live drummers playing real live acoustic instruments. However, it's much more fun to switch these values to random (the equivalent of turning all the knobs up to 11), then sit back and enjoy the show. It's certainly one way of avoiding hi-hat lines that sound like the tick-tocking of your grandfather's clock. You can use the MD16's auto pan features here too, setting up instruments to automatically pan across the stereo spectrum during a roll (great for those drum 'n' bass machine-gun snare and hi-hat effects) or ping-pong every other beat.

Also meat and drink to any creative rhythmist are the programmable echo banks which can be assigned to any pad. These aren't FX units, but more akin to the MIDI delay facilities you find on sequencers such as *Cubase*. The number of repeats, and repeat and decay rates, are separately programmable for each unit, making it possible to create anything from short flams to huge, rolling echoes. Even more excitingly, you can link the echoes to the pitch-programming parameters to create echo repeats with increasing, decreasing or random pitch changes. Scary stuff!

As for the pattern programming side of this wondrous beast — I'll be honest. My MD16R is integrated into a *Cubase*-driven MIDI studio, so I don't have much cause to program the patterns from the front panel. But let me assure anyone interested in using the MD16 as a stand-alone drum machine that they won't find it wanting in any department. Real or step time in pattern or continuous 'tape' mode?

You got it. Programmable tempo? You got it! Humanisation, randomisation, pre- and post-quantisation, post-quantisation? Got it, got it, got it, GOT IT! And, memory permitting, the 254 patterns can be combined into 254 songs with 127 steps in each. Songs can be

> ## "So what's the catch? Why isn't this machine a legend in its own swing time?"

assembled into chains of 20 for live performances and the Cheetah even has the decency to insert pauses for the inter-song swig of beer. Oh, yeah — and it syncs to tape too, generating its own code and acting as a MIDI-sync converter to boot.

TOO CLEVER BY HALF

So what's the catch? Why isn't this machine a legend in its own swing time? Why have you never even heard of the MD16? Well, in many respects, the MD16 collapses under the sheer weight of its own cleverness. The number of functions and sub-functions on offer is not matched by a corresponding number of buttons with which to access them. With each menu generally consisting of a minimum of 12 parameters (and some running to 20 or so), navigating your way through the programming system is a pain in the proverbial. And matters are not helped by a manual which makes *War And Peace* look like *The Famous Five Have a Very Boring Day*. While, to give credit where credit's due, it does explain the mechanics of the unit in great detail, it doesn't describe the principles behind them, making it difficult for a novice user to get a real sense of just what a stick of creative dynamite this machine could be. As one reviewer remarked at the time, getting to know the MD16 was like peeling back the layers of an onion. Each time you stripped back one layer, there was another waiting to be discovered. And I'm sure that many potential and even actual users felt that peeling this particular onion wasn't worth the tears.

The problem was that there were never really enough owners to spread the word. Like most modest enterprises, Cheetah lacked the resources to really sell the MD16's features through an appropriate all-singing, all-dancing marketing campaign. Despite their 'Affordable Excellence' copy line, the rather dull black-and-white ads which were occasionally seen in the technical music press simply reinforced the view that because Cheetah products were cheap, ergo they must be nasty. In retrospect, affordable excellence was much nearer the truth.

STALKING A CHEETAH SECONDHAND

Convinced enough to want to make this shoulda-been-a-classic part of your collection? Secondhand examples of the MD16 in any of its three forms should be fairly easy to come by, particularly as, when Cheetah went bust, several dealers sold off the last models at knock-down prices. There's nothing like the prospect of a bargain to tempt people to take a flyer on what they would otherwise regard as a bit of a risky investment. Expect to pay £100-£125 for the desktop or standard rackmount version, unless there are some extra sound modules on offer. The MD16RP is worth £25-£50 more, as its eight trigger inputs make it

an supremely useful piece of gear to have around in a project studio. It also represents an excellent buy for wannabe electronic percussionists.

Despite criticisms of its somewhat flimsy case when it first appeared, the MD16 seems to have proved robust enough under field conditions. Check the condition of the velocity-sensitive pads on the desktop version, though if just one or two are duff you can still access all the sounds over MIDI. The rackmounted versions are blessed (or cursed, depending on your point of view) with tacky, non-velocity-sensitive black plastic programming buttons which have a tendency to

stick after extensive use. But, as I'm sure few Cheetah owners ever bothered to get to the bottom of the MD16's arcane programming structure, prodding fatigue may well not be an issue here. The good news is that Cheetah tended to use off-the-shelf components, rather than custom chips, so a reputable service company should be able to deal with repairs. Having owned both an MD16R and MD16RP (along with other bits of Cheetah equipment), I've had no problems.

I've never put this theory to the test, but there used to be an unspoken Murphy's Law about Cheetah products and other British-designed equipment — if it worked the first time you switched it on, then it would work for ever.

KEYBOARDS

AKAI MX73 master keyboard, £210; Korg Poly 800, no manual, £110; QSC USA850 power amp, 425 watts RMS, £440, 4U rack bag new, £60. ☎ Carol 01507 606956.

AKAI SG01V vintage synth module, Excellent condition with manual, £200; Alesis MMT8 sequencer, manual and PSU, £100; Akai ME20 rack MIDI arpeggiator, £50. ☎ Matt 0151 236 5551 9-5pm.

AKAI SG01V vintage synth module, 256 terrific sounds, plus drums, reverb, sounds easily edited, perfect condition with manual, psu, etc. £210. ☎ 01933 678608.

ALESIS S4+ perfect condition, open to sensible offers; Yamaha TG33, good condition, £200 ono. ☎ Simon 01582 758731.

ALESIS QS6 immaculate condition, never used, boxed as new, £600, no offers; Korg M1 workstation, £500. Both £1050. ☎ 0181 672 9689 eves.

ALESIS QUADRASYNTH+ over 500 sounds, built in Quadraverb II effects buss, 16-part multitimbral, 64-note poly, excellent sounds and drum kits, with software for Mac, £750 ono. ☎ Paul 0191 410 7471 after 6pm.

CASIO CZ101 excellent condition, with power supply and manual, £85; Yamaha TX81Z 4 operator FM MIDI module, inc Atari ST sounds and editor, £150. ☎ Dave 01484 715171 after 6.30pm.

CASIO CZ1000 digital synthesizer MIDI, 32 memories, 4/8 voice polyphonic, good condition, manual and PSU, £120 ono. ☎ 01749 840115.

CASIO CZ5000 excellent condition with manuals and RAM cart, £195. ☎ 0973 639595 (Notts).

CASIO CZ5000 classic synth with sequencer, 5 octave keyboard, home use only, with manuals, £280 ono. ☎ 01484 845780.

CHEETAH MS7P 88-note weighted master keyboard, fully programmable, 100 memories, ideal for home/studio use, needs slight attention, hence £225. ☎ 01452 720464.

CONTROL SYNTHESIS DEEP BASS 9 as new, still under warranty, £240. ☎ Mark 01942 413975.

EMU CLASSIC KEYS sound module all the vintage sounds you need, £350. ☎ Andy 0114 286 2209.

EMU CLASSIC KEYS module, only one month old, boxed, manuals, etc, reluctant sale, £350. ☎ 01705 874006.

EMU PROTEUS good condition, £300 ono; Yamaha SY55 with hard case, two memory cards, £450; Spirit Folio SI, boxed with manual, excellent keyboard mixer, £350 ono. ☎ 01462 712008.

EMU PROTEUS £260; Philip Rees 5x5 MIDI patch bay, £35; 3-way MIDI splitter, £5; high power computer speakers, £15; Cakewalk Express sequencer, £25. ☎ 01827 58913.

EMU PROTEUS PLUS orchestral module, boxed with manuals, £400; Atari 520STFM, 1Mb with mono monitor, £220; Notator SL v3.1, £100. ☎ Bill 01590 677162.

EMU PROTEUS WORLD sound module, 32-note, 16-part, six outputs, great sounds, instant Africa!, mint condition, £300 ono. ☎ Jon 01566 784665.

ENSONIQ ESQ1, RAM cartridge, £300 ono; Studiomaster Sessionmix 16 2, £300 ono; Alesis Quadraverb+, £200. ☎ 0116 267 1715.

ENSONIQ ESQ1 with expanded memory and program cartridge, £375; Emu Proteus, £250; Kawai K1R, £150; Sequential Tom drum machine with flight case, £150. ☎ 0131 652 2120.

ENSONIQ SQ1+ with case, vgc, £300; Roland D20 workstation, £300; Yamaha SU10 sampler as new, £200; Casio RZ1 sampling drum machine, £90. Accept sensible offers. ☎ 01734 775490.

ENSONIQ SQ2 32-voice polyphonic, 76-note keyboard synth/sequencer/effects, as new, boxed, including manual, £550. ☎ 01977 791770.

ENSONIQ TS12 weighted keyboard, 8Mb sample RAM, boxed, £1150; EPS6+ Turbo, Waveboy filter disks, external input to effects, sequencer, boxed, £650. Both for £1700. ☎ Andy 01291 430704.

ENSONIQ VFX SD good condition with manuals and sounds, £250 ono; Ensoniq VFX, mint condition, £200 ono. ☎ 0161 366 8744.

FARFISA G7K keyboard with harmoniser/vocoder, unused as new, £995; Yamaha PSR7000, £1100 mint; Solton MS60, £1100 as new. P/ex possible. ☎ 01344 891110.

FATAR STUDIO 1100 88 key weighted piano action master keyboard, four programmable MIDI zones, velocity and aftertouch, home use only, £550. ☎ Paul 01527 873101 (Bromsgrove).

FENDER RHODES 73 MKII stage piano, rare, mint, ungigged condition, £400. ☎ 01732 361442 (Kent).

GEM S2 Turbo with sample disks; good condition, £900 ovno; Roland alpha juno 2, vgc, £350. ☎ 01554 777215.

GEM S2 workstation, excellent sequencer, six audio outs, lots of good sounds and two MIDI ports complete with hard case, £750. ☎ Robin 01223 363837.

GEM S2 with turbo expansion, 32-note poly, loads Akai samples, easy sound editing, box and manuals and some disks, £800. ☎ Cliff 0114 286 4135.

GEM S3 TURBO keyboard, 16-note, extensive features including sample loading, flightcase also included, vgc, £675. ☎ Steve 0115 916 2170.

GEM S3 TURBO 76-note master keyboard, many features, home studio use, £1000. ☎ 0181 692 5105.

JEN SX1000 monophonic synthesiser, 37 note (C-C), £89. ☎ 01734 312989.

KAWAI K1 in good condition with flight case, extra sound card and ST sound library and editor, £250. ☎ Pete 01522 889749.

KAWAI K1R, £160; Alesis MMT8, £110; Teac model 2A mixer, £100; Roland SH101, £230. Delivery arranged. ☎ 01974 261318.

KAWAI K4 with Atari editor, £300; Dynamix 8-track mixer, £100; Bass Station rack, £280; Yamaha DX100, £100; Yamaha RY30, filters, boxed, £200; Amiga 1200 with all music accessories, £150. ☎ 0191 276 3842.

KAWAI K4 synth, excellent condition with quality flight case and ST disc packed with extra sounds, £375. ☎ Pete 01522 889739.

KORG 700 monosynth, £150; Juno 60, £275; JSQ60, £35; JX8P, £295; TX802, £295; EMT10, £95; PG1000, £110; CS80 original owners manual, £15; DPX1, £275; EMS P/V convertor, £250. ☎ 01726 66715.

KORG CX3 single manual organ with drawbars, excellent condition, £450; Roland SC55 Sound Canvas, £235; Korg EX8000, £300; Yamaha TX81Z, £150. All with manuals. ☎ 01268 515255.

KORG O1/W PRO X 88-key piano weighted workstation, 400 superb sounds, 16-track digital recording, effects, home use only, immaculate condition, all manuals, £1200. ☎ 01342 826686.

KORG O1/W PRO 76-key synth, two expansion cards, excellent condition, boxed with manuals, home use only, £800 ono. ☎ Chris 01964 613296.

KORG 01/W FD with stand, cover and software, £850; Korg i3 with similar, £950; Juno 6, £250; 4Mb Atari with colour monitor, disc drive, software, £275; Phonic mixer, £180. All home use. ☎ David 0161 976 5136.

KORG 01/W immaculate with manuals and flight case, £700 ono. ☎ Nick 01242 577848.

KORG 01/W FD boxed with manuals, hardly used, includes stand, pedal and leads, £800 ono. ☎ Jo 01803 328872.

KORG 05R/W module, immaculate, 16 midi channels, 340 sounds, pianos, drums and basses all fully editable, £300. ☎ 0958 552132.

KORG DW8000, £265; Roland JX8P, £250. Home use only. ☎ 0181 390 2700.

KORG I3 interactive workstation, immaculate condition, boxed, manuals, home use only, virtually unused since purchase, £975. ☎ Graham 01606 882881 after 6pm.

KORG M1 with manuals, boxed, hardcase, £500; Roland D50, sound card, manual, boxed, hard case, £450 ono. Both good condition. ☎ Graham 01235 868341.

KORG M1 workstation, home use only, £500; Quasimidi Technox, excellent dance module, £550, both with manuals. ☎ Nick 0131 446 9072.

KORG M1R synth module, mint condition, two memory cards, £410. ☎ Jay 01933 316584.

KORG M1 one careful owner, extra ROM cards and sounds on disk plus video, still boxed in superb condition with all manuals and flight case, £595. ☎ 0113 275 9723.

KORG MS20 excellent condition with patch leads and manual, £420; Roland Juno106, excellent condition, recently serviced, with manual, £420. ☎ Ben 01280 814385.

KORG MS20 £300; Roland D110, £150; RAM 30 pin, 16Mb, two off, £90 each. ☎ Glen 01442 244804.

KORG P3 Piano module with orchestral expansion card, £125ono. ☎ Paul 01377 270897.

KORG PROPHECY synth, £595. ☎ 01225 751933.

KORG PROPHECY With new sounds, manuals etc, mint condition, £725. ☎ John 01482 322049.

KORG TRINITY PRO 76-key with Prophecy synth, latest v2 software, 1 month old with manuals, disks, redundancy forces sale, £2199. ☎ Mark 01375 641526.

KORG WAVESTATION A/D Emu Classic Keys, 10U rack case, offers? Swap my wavestation for your Korg BX3 dual manual organ? ☎ Henry 0181 840 3249.

KORG WAVESTATION A/D immaculate, boxed, manuals, does wave sequencing, vocoders, analog inputs, etc., £840 ono. ☎ Shaun 01273 690064.

KORG WAVESTATION FX with three cards, £675 ono; Ensoniq EPS sampling keyboard, full memory,10 outputs, library, £600 ono, Seck mixing desk, good condition. ☎ 01337 828496.

KORG WAVESTATION SR, £450; Novation Bass Station, £175; Soundcraft Spirit Folio 12 2, £200; Mackie 1202, £175; Lexicon Alex, £175. All mint, baby forces sale. ☎ Tony 01732 361866.

KORG WAVESTATION with piano sample and three performance cards, hard case, manual, £600 ono. ☎ Lee 0191 201 5232, 0191 416 5631.

KORG WAVESTATION three cards, all manuals, home use only, excellent condition offers around, £600. ☎ Steve 0115 946 4486 (Nottingham).

KORG WAVESTATION A/D as new, complete with manuals, £650. ☎ Jose 0181 877 3657.

KORG WAVESTATION one owner, never gigged, studio use only, £450. ☎ Carl 0151 264 8961.

KORG X3 workstation with disks and video manual, excellent condition, home use only, £800. ☎ Stuart 01205 358522 after 6pm.

KORG X3 stand, pedal, extra sound disc, £650; Roland JV880, £400. Both never gigged. ☎ Kev 01274 630780 eves.

KORG X3 workstation, vgc, £700; Roland U20, £400 ono. Both with manuals and sound disks. ☎ Mark 0181 859 3401.

KORG X5DR sound module, 336 sounds, 200 fat combinations, 47 effects, drums etc, vgc, with manual, PSU, etc, £320. ☎ 01933 678608.

KORG X5D 16-part synth, £470, no offers; Roland MVS1 vintage module, £295 no offers; Roland TR727 drum machine, seperate outs, PSU, no manual, £130. ☎ 01708 523469.

KURZWEIL RACKMOUNT V2, including sampler option, £1600; Korg Wavestation, £699; Roland R8 drum machine, £399; Novation Bass Station, £199. ☎ Charlie 0410 346455.

KURZWEIL K2000 16Mb, sample option, v3, 280Mb internal HD, fan, £1700; JP6, MIDI update, £675; MS10, £185; MS20, £275; SQ10, £250; Quasar Hardcore board, £675. ☎ 01291 430704.

KURZWEIL K2000 V2 16Mb RAM, sample option, 1000 K2500 sounds, £1599; Alesis Quadrasynth+ piano, £699; Yamaha VL7, £699; Technics SX WSAIR, £999. All ono. ☎ Andy 01278 794110.

LOGAN STRING MELODY II very collectable late 70's string machine, good working order/general condition, flightcased, reasonably priced at, £125, seriously interested callers only please. ☎ Jon 01952 260064 (Telford).

MOOG MINIMOOG, £900; SH1, £195; Hammond DPM48, £55. ☎ 01726 66715.

MOOG ROGUE monosynth, two oscillator, sample hold, sync, glide, noise, audio in, C.V. trigger, pitch mod wheels, power adaptor, manual, charts, mint condition, £200. ☎ John 01389 751843.

NOVATION BASS STATION rack, brand new, £300. ☎ Rob 0161 256 1548.

NOVATION BASS STATION keyboard, boxed, hardly used, £220. ☎ 01723 354647.

NOVATION BASS STATION rack, £250; Alesis Microlimiter, £70. ☎ Mark 01246 570781.

OSCAR MONOSYNTH good condition, later software version, offers over £700. ☎

01780 65592

OBERHEIM XPANDER with MIDI and manual, perfect condition, £1350. ☎ Nicolas 32 3 2367454 or Fax 32 3 2358766 (Belgium).

OBERHEIM MATRIX 6 analogue parameters, £525. ☎ 01423 504560.

QUASIMIDI TECHNOX sound module, £550 ono; Goldstar GMK49 keyboard, £90. Both hardly used. ☎ Mike 0114 281 6811 eves (Sheffield).

RHODES MK80 great expressive Rhodes and piano sounds, very realistic vibes, full weighted keyboard, stand, manuals, never gigged, as new, £800. ☎ 01923 266664.

ROLAND D50 with professional flightcase, three RAM cards, sustain pedal and manual, great sounds, £325 ono. ☎ 01236 821385.

ROLAND D50 with PG1000, immaculate, cover and all manuals, home use only, extensive sound collection on Atari disk, £550 ovno. ☎ 01255 431288.

ROLAND D110 £170; Kawai K1R, £160. Both immaculate, boxed with manuals. K4 keyboard with stand, pedal and manuals, £300. ☎ Alan 0181 959 0971.

ROLAND JUNO 60 analogue polysynth with memories, excellent dance/techno machine, excellent condition, £285 ono. ☎ Rob 0117 955 8521.

ROLAND JUNO 106, £400; Roland JX10, PG800, case, two cartridges, £875; Emu Proteus FX, £300. All immaculate condition, manuals, some boxed. ☎ Johnathan 01404 814369.

ROLAND JUNO 106 mint, plus flightcase, £480, no offers; Tascam 688 MIDIstudio, £950; Ensoniq VFX SD, mint plus flightcase, £525. ☎ 0181 905 5917.

ROLAND JD800 With case, £1000; CD3000 10Mb, analog input board, £1400; Soundcraft Selta 200 32 4 2, £2500 ono. ☎ 0171 261 0929.

ROLAND JD800 very good condition, manuals, £1200 ono. ☎ Tom 01705 524060.

ROLAND JD990 mega synth module, loaded with JD800 factory patches, great value, as new, £940. ☎ Graham 01234 306346.

ROLAND JX1 synth, £200; Roland TR626 drum machine, £100; Casio CT656 home MIDI keyboard, £80; Korg Delta analogue synth, £100; Korg Poly 61 synth, needs slight attention to keys, £80. ☎ 0151 281 9655 after 6pm.

ROLAND JV1000 workstation, good condition with all manuals, £900. ☎ 0131 665 4433 after 6pm.

ROLAND JX3P programmable analogue polysynth, lovely mint condition, but slight fault with sequencer trigger button, £200. ☎ Jon 01566 784665.

ROLAND JX3P with programmer, mint condition, £350 ono; ARP Axxe analogue keyboard, £250 ono; Roland S760 sampler with OP760 upgrade, never used, £1300 ono. ☎ 0141 221 1808.

ROLAND JX8P lovely easy to use analogue synth, good condition, £300. ☎ Guy 01268 544099 eves, 295192 days.

ROLAND JX10 mint, manual, ROM card, £600 ono; Roland MKS70 vgc, manuals, ROM card, £500 ono; Casio VZ10M, funky, mint, manual, card, £250 ovno. ☎ 0181 244 7946 eves only.

ROLAND JV1080 with analogue board, mint condition, £750; Yamaha TG55 as new, £200 ono; Roland MT32, £80. ☎ Jim 01375 382597.

ROLAND JX3P classic MIDI analogue polysynth, excellent condition with manuals and factory sounds tape, £250. ☎ JJ 0171 282 3684.

ROLAND MDC1 dance module, huge sounds, reluctant sale, still boxed as new, £200. ☎ 01903 820158.

ROLAND MKS70 mint, £550; ARP 1623 sequencer, mint, £475; Yamaha CS50 vgc, £299; Yamaha DX7 vgc, £275; Korg Mini 700, £120; Roland E86 vgc, £850 ono. ☎ 0116 283 5455.

ROLAND MVS1 vintage synth sound module, great analogue sounds etc, as new with power supply, manual etc, £220. ☎ 01933 678608.

ROLAND SUPER JD990, £800; Akai S950 fully expanded, £650; Yamaha AM802 8-track mixer, £150. All top condition. ☎ Chris 0121 605 9283.

ROLAND SC155 GM sound module with built in mixing/sliders, home use only, £400 ono. ☎ Rob 01623 514777 days, 0115 965 4121 eves.

ROLAND SC88 Sound Canvas, 32-part, 64-voice multi-timbral with 654 sounds and 24 drum kits, excellent condition, boxed with manual, £400 negotiable. ☎ Chris 01703 368633.

ROLAND SC88 boxed as new, £300; Yamaha TX81Z, mint, £165; PC3 MIDI interface, 1 in 3 out, boxed as new, £100; Amiga 1500 50Mb HD, £150. ☎ 01702 616961.

ROLAND SC33 Sound Canvas, flat like Dr Synth, 226 sounds plus drums, effects etc, single and multi mode, GS standard, vgc with psu, manual, £165. ☎ 01933 678608.

ROLAND SOUND CANVAS & BRUSH SB55 & SC55 ideal on stage MIDI file sequencing, mint condition, manuals, £350 on, can deliver. ☎ 01773 528757.

ROLAND SH101 with modulation grip, flight case and manual, as good as new, £300 ono. ☎ Paul 01753 868335.

ROLAND SH101 mint condition, boxed with manual and mains adaptor, £250. ☎ Rob 01493 842225.

ROLAND TB303 Bassline, manuals, etc, mint condition; MC303 Offers. ☎ 01228 45982.

ROLAND XP50 Mint condition, home use only £999 ono plus free user video, boxed as new, MT4X multitrack cassette recorder, mint condition, boxed as new £350. ☎ Charlie 01780 52627.

ROLAND XP50 as new with extra sounds and flight case, £900; Alesis Midiverb, boxed as new, £180; Digitech Studio Twin FX, £150. ☎ Geoff 0115 933 3656.

ROLAND XP80 as new, £1095; MC50 sequencer, £195. ☎ 01628 482560.

ROLAND MVS1 vintage module, £250 or swap for Novation Bass Station. ☎ Gordon 01625 529860 after 6pm.

ROLAND RD300S digital piano, MIDI, 88 keys, £500; Laney 65W keyboard amp, 3 channel inputs, reverb, £150. £600 for both. ☎ Chris 0171 733 7552.

ROLAND SH09 analog monosynth, good condition, original soft case, £200; Roland D10 LA synth, good condition, all manuals, £275; Stabilizer five frequency shifter, £250. ☎ 01580 860618 (Sussex).

ROLAND D50, £325; Roland XP10, £350; Roland MIDI bass pedals, £220; Yamaha SY22, £250; Yamaha MDF2 MIDI file player, £250. ☎ Carl 0161 720 8759.

ROLAND D10 multitimbral synth, good condition, manuals and stand included, £260 ono. ☎ Matt 01705 756494 (Portsmouth).

ROLAND JV880 excellent condition, home use only, with manual, £410; Tascam MM1 20-channel mixer, MIDI mute, 4 aux, manual, home use only, £400. ☎ Pascal 0181 368 1877.

ROLAND JUPITER 6 2 VCOs 2 ADSRs, MIDI, programmable memories, split mode, arpeggiator, solid analogue sounds, £695; Boss BX16 16-channel mixer, £175; Yamaha QY10, £55. ☎ 01268 525347 (Essex).

ROLAND MKS70 Super JX rack with PG800 programmer and RAM cart, £650; Sequential Prophet 5 Rev2, £700; Emagic Sound Diver/Surfer for Atari, £60. ☎ Brian 01752 550199.

ROLAND JV1090 module with orchestral card, immaculate, boxed, £900 ono; Roland MKS70 synth module with two ROM and one RAM cartridges, £600 ono. ☎ 01787 476108 (Essex).

ROLAND D110 rack module, excellent condition, boxed with all manuals, £200. ☎ Keith 01703 320966.

ROLAND D70, £500; Korg 01/W FD, £900, excellent condition, reluctant sale, getting married. ☎ Steve 01922 23017.

SEQUENTIAL PROPHET 600 analogue 12 VCO MIDI synth, loads of knobs, original factory preset tape with manual, absolutely mint condition, just serviced, £600. ☎ Tony 01733 760330.

SEQUENTIAL MULTITRAK 6-voice, 6 VCO multitimbral analogue synth with MIDI, programmable, £350; Oberheim Matrix 6R with editing software, £420; Korg Wavestation EX, 5 cards, 515 highest quality 20-bit sounds, exceptional, £650 ono. ☎ 0161 438 0534.

YAMAHA B200 workstation, 8-track sequencer, 4 operator FM synthesis, velocity and aftertouch, built in monitors, mix external sounds with internal sounds, £375. ☎ 01787 312593.

YAMAHA CLAVINOVA piano, full size, weighted action piano, £395 ono. ☎ David 01785 662896 (Stafford).

YAMAHA CLAVINOVA DFP100 digital electric piano, 88-note weighted keyboard, built in speakers, home use only, £1250 ono. ☎ 0171 254 8384.

YAMAHA CS01 micro monosynth, vgc with manual, £80; Korg Micropreset monosynth, as used by OMD, £75 ono; Yamaha TX81Z multi-timbral FM rack, £150 ono. ☎ Adam 01352 712937.

YAMAHA CS1X killer dance machine, real time controls, brilliant arpeggiator, GM compatible, Mac/PC MIDI interface, effects, box, manuals, PSU, £500. ☎ 01354 695239.

YAMAHA DX7 in excellent condition, spotless with two cartridges, sustain pedal and MIDI cable, home use only, £300, no offers. ☎ 0171 720 3702.

YAMAHA DX7 mint condition, must be seen, many cartridges, £400; three tier keyboard stand, £50; Yamaha R100 reverb processor, £60. ☎ 01992 440838.

YAMAHA FB01 MIDI module, home use only, £75 ono; Trantec S1000 radio mic, excellent condition, £145; Soundtech ST300cx 3/4/5 way crossover, £120 ovno. ☎ Mike 01908 662551, 01908 324719.

YAMAHA PSR5700 keyboard, lady owner, excellent condition, £850. ☎ 01253 500808.

YAMAHA SY55 workstation, dance soundboard, 909, 808, £425; Roland D110 with two soundcards and Atari editor, £200; Ensoniq Mirage sampler, £250; Yamaha multi effects, £70. ☎ Paul 01604 471566 after 4pm.

YAMAHA SY85 immaculate condition with ethnic sound cards doubling your sounds, stand, case and manuals, £750; Roland JV880 excellent condition, with dance expansion board, £600. ☎ AJ 01494 445605.

YAMAHA SY85 excellent condition with memory card, load of extra disks plus flight case, £750 ono. ☎ Barry 0117 955 3748.

YAMAHA SY85 synth, £700; Emu Proformance piano module, £150; Alesis D4 drum module, £200; Boss MX10 pro halftrack mixer, £120. All excellent condition. ☎ Dave 01224 232047.

YAMAHA SY85 boxed as new, complete with disks and memory card, £550 or offers. ☎ Nick 01343 812121 ext 3132 days.

YAMAHA TG55 sound module with manual and one sound card, £300; BSH 3U flight case, black, £65; Shure BG10 mic as new, £30. ☎ Michael 01438 220457.

YAMAHA TG77 rack synth, £450; Steinberg Synthworks SY77 for Atari, £75; Atari 1040 STE, SM144 monitor, Pro24, accessories, games, £200; Midiman Smartsync SPP syncbox, £60. ☎ Dave 01224 232047.

YAMAHA TG300 manuals, home use, £250 no offers; Emagic *Micro Logic* for Mac, boxed, manuals, Log 2 interface, £80. ☎ Karl 01925 226005.

YAMAHA TG500, £399; Roland JV30, £295; Roland Alpha Juno 1, £285; Oberheim Matrix, £250; Akai CD3000i, 8Mb+lib, £1495; Audio Technica 4033/cr, £385; Alesis Monitor 1s, £195. ☎ 0468 432558.

YAMAHA TG500 64-note poyphonic, resonant filter, software, boxed, mint, £375; Casio VZ1 superb controller, aftertouch 3 modulation wheels, £240. Both home use only. ☎ 01202 57940.

YAMAHA TX81Z classic 4-operator FM synth module, 8-part multitimbral, 1U rack, killer basses, manual, sounds/editor on ST disk, £180. ☎ 01354 695239.

YAMAHA TX81Z synth module, £165; Atari Falcon 14Mb, 350Mb IDE, 250Mb SCSI2, *Cubase Audio 16*, FDI, £1300; Amiga 1500 with 50Mb HD, £150. ☎ Ian 01702 616961.

YAMAHA W7 including dance and vintage boards plus sound disks, 4 months old and boxed. ☎ 01207 509866.

YAMAHA W7 workstation, rhythm expansion board fitted, excellent condition, home use only, stand, £775 ono, buyer collects. ☎ Jon 01939 220630.

YAMAHA W7 workstation synth, manuals, piano board, three sound disks, semi-flight case, £799 ono; Kawai K1M synth module, £139 ono. £900 the lot. ☎ Ben 01482 494737.

YAMAHA MIDI PIANO weighted, full size, £750 ono; Bass Station rack, £275 ono. ☎ 0121 449 8024.

YAMAHA PF15 piano, MIDI, 88 key, weighted with case, good condition, £250 ono; Yamaha DX21 with case, mint condition, £150; Casio CSM10P piano module, boxed, £50. ☎ 01900 68268.

YAMAHA TG100 sound module, vgc, boxed, manuals, £110. ☎ 01438 720593.

RECORDING

AIWA/HHB Pro portable DAT recorder, £600; Fostex X-28H 4-track, £275; AKG C1000S microphone, £140; Zoom 9030 effects, £225 All virtually unused. ☎ Dave 01224 232047.

AKAI DR4D With 540Mb internal drive, £650; DL4d remote, £350. ☎ Joe 01558 668511.

AKAI MG140 12-track recorder, ML14 autolocater, XR300 SMPTE sync, two 8-way looms, £1300; Fatar Studio 900 keyboard, £450. ☎ 0181 578 4959.

AKAI MG1214 12-channel mixer, 14-track recorder, digital patchbay and auto locate

pro kit, boxed with manual and 20 tapes, excellent condition, £1500. ☎ Doug 0973 214218.

ALESIS 1622 16 track mixer, £350 ono; Alesis 3630 stereo compressor, £175 ono; Behringer Ultrafex exciter, £175, Alesis Quadraverb GT, £250 ☎ 0121 449 8024.

ALESIS 1622 mixer, 16 inputs, eight with mic pre-amps, 8 direct outs, 6 auxiliarys, £250 ☎ Chris 01923 714682.

ALESIS ADAT XT brand new, unused, boxed with manuals, £1950, Fostex 160, 4-track tape machine, boxed with manual excellent condition, £160, UMI 3S sequencer for BBC Micro, 1 in/2 out MIDI interface with Sync 24 and FSK, manual, £75 ☎ 01925 724093.

ALESIS ADAT v4.03, one 115 hours use, £1495, the other 197 hours use, £1400, both home use only. £2750 for both ☎ 01708 670017.

ALESIS ADAT two units and BRC, all in good working order, £2500 for 16-track digital recording. ☎ 0118 969 5508.

ALESIS ADAT v4.2, perfect condition with box, manual, £1500, Soundcraft 400B desk, £1300, Alesis Quadraverb, perfect, box & manual, £280 ☎ Marco 0181 8759259.

ALESIS ADAT superb condition, 475 hrs, Tascam M2516 desk, loom, Sony DAT player, Peavey Accoustic Architecture speakers, loads of leads, excellent package complete with Datasync, £3600 ☎ 01983 752990.

ALESIS MICRO RACK Micro gate, Micro limiter and Microverb II, simple, practical studio tools complete with power supplies and manuals, £195 ☎ 0181 995 6047.

ALESIS MONITOR 1 very low home use, mint condition, £200 ono ☎ Phil 01303 221081.

ALESIS QUADRAVERB perfect condition, £190 ☎ Jon 01342 825158 (Gatwick).

ALLEN & HEATH 24:8:16:2 mixer, as new, patchbay, meter bridge, home studio use only, £875 ☎ Simon 01323 844557.

ALLEN & HEATH SYSTEM 8 16:8:2 mixer, meter bridge with VUs, flightcased, £500 ono, Akai ME80 programmable MIDI patchbay, unused, boxed, £150, AKG C3000 mic, boxed, £200 ☎ 01273 327889.

BEHRINGER ULTRAFEX II boxed, manual, never used, £120. ☎ 01792 368786.

BEHRINGER EURODESK 2642 nearly new 16-26 channel, £500 ono ☎ 0973 814745.

CASIO DA7 DAT with case, £300; Tascam 464, top of range 4-track, £480 ☎ James 01902 838263, 01691 656221.

DBX 160X compressors, £375 the pair; Rocktron Interfex, £350, Lexicon LXP5 offers? ☎ 0121 422 9605.

DOLBY A360, two at £75 each, Dolby A361, two at £100 each, Yamaha R1000 digital reverb, mono 19" rack mount, 3 band parametric EQ, £75, Powertran MSC1 delay sampler, £65 ☎ Mike 0181 870 3880.

DYNAUDIO BM15 monitors, mint condition, only three months old, boxed and guaranteed, too big and powerful for me, £695 P/X welcome ☎ Matt 01233 623660.

FOSTEX 280 4-track with 8-channel mixer, Dolby C, vgc boxed with manuals, £320 ono ☎ 0171 480 6528.

FOSTEX 280 4-rack recorder in mint condition, boxed, manual, hardly used, £410 ☎ 01872 73241.

FOSTEX 450 8-track mixing desk, excellent condition, £400 T> 01942 878917.

FOSTEX 4050 autolocator SMPTE controller for Fostex multitrack machines, £145, Alesis SR16 drum machine, £100. ☎ 01332 776244.

FOSTEX A8 inc remote, £375, Zoom 9120, £175, Yamaha MSS1 SMPTE unit, £125. All immaculate with manuals, some boxed ☎ Johnathan 01404 814369.

FOSTEX COMP/LIM £90; Fostex 8:2 line mixer, £60; GBS stereo spring reverb, £50; JLC PPS1 synchroniser, £75, Yamaha R100 16-bit reverb, £75 ☎ 0181 643 8381.

FOSTEX R8 boxed with manual, two reels of tape, very good condition, £620 ☎ 01273 833950.

FOSTEX R8 8-track, MTC1, £650 ono; Bass Station keyboard, £190 ono; TB303, £250 ☎ 01925 673856.

FOSTEX R8 and 812 mixer, inc looms, blank tapes etc, low hours, £1050; Aiwa HDS1 portable DAT, £250; Alesis Micro compressor, noise gate, enhancer, £45 each ☎ 01962 886301.

FOSTEX R16 with remote, private use only, two reels Ampex 456, £1300. ☎ 01268 35686.

FOSTEX 280 as new, recorder hardly used, boxed with carry case, £300. ☎ 01737 557856.

FOSTEX DCM100 Mixtab, put the mixer in you rack, MIDI-controllable, mint, £150.

☎ Guy 01268 295192 days, 01268 544099 eves.

FOSTEX DMT8 VL excellent condition, boxed with manual, £850, or swap for pristine condition Roland S550 complete with monitor, hard drive and master keyboard. ☎ Tim 01708 454963.

FOSTEX DMT8 digital 8-track, boxed with manual, £900; Seck 18:8:2 MkII mixer, mint, £500; Sony DTC690 DAT machine, boxed, manual, £400; Peavey HySis2, pair, £500. ☎ 01206 573677.

FOSTEX DMT8 brand new, £1000; Technics DAT Machine, £350; LA Audio GCX2 Compressor, £150, Alesis Microverb III, £100; Yamaha RX5 drum machine. ☎ Andrew 016974 78069.

FOSTEX R8 boxed, manuals MTC1 remote extension cable, genuine under 20 hour home use, mint, £695. ☎ 01708 781312 (Essex).

FOSTEX DCM100 Mixtab, programmable 8 channel MIDI mixer, £250 ono Write R Pearce, 9 Oxford Street, Woodstock, Oxford OX20 1TD.

FOSTEX DCM100 with Mixtab MIDI automated mixer, stereo, 8:2 ,mute and gate, £380. ☎ 01432 342343.

FOSTEX E16 1/2 inch, very good heads, remote box, £1600; Korg M1 flightcase cards etc, £560; Yamaha rev100, £170; Yamaha R1000, £60. ☎ 0181 446 7092, 0181 208 3785.

FOSTEX E16 with brand new capstan, £1400. ☎ 01273 674907.

FOSTEX R8 MTC1 and remote extension, still boxed, all in excellent condition, £650. ☎ 01386 83239.

MACKIE 1202 VLZ boxed with manuals, as new, will demonstrate, 3 months old, sale due to upgrade, £285 ono. ☎ 01329 238621 after 5pm.

MACKIE SR32-4 32 channels, 6 auxs, Mackie air, mint, £1500. ☎ Alex 0171 639 0762.

M&A MIXER 16-channel, four buss, seven band EQ, four Aux sends, monitor outputs, 10 extra input channels available, £300 ono poss swap. ☎ Martyn 01924 894408 (Wakefield).

MTR 16:2 recording/PA mixer with lockable cover, EMD 6-channel phantom, home use only, both perfect, £250 or reasonable offer, will split. ☎ 01634 301593.

MXR FLANGER/DOUBLER 19" rack mounting, digital analogue FX, £300, 17XR dual 15 band graphic, £149. ☎ 01865 776587 (Oxford).

OTARI MX5050 mastering machine, private use only, as new, boxed, manual, £525 ono, Sony PCM 701 digital recording on video machine, £250 ono ☎ Mike 0181 870 3880.

PANASONIC SV3800 professional studio DAT recorder, four months old, boxed, as new, £750. ☎ George 01442 823134.

PEAVEY UNITY 1000 12:2 excellent basic mixer, £250 ono, Tascam Porta One 4-track, £120, Vox AC30, early 70s, needs minor attention, £375 ☎ Steve 01604 460906.

PHILIPS DCC730 digital cassette deck, great condition with manual, tapes, remote etc, perfect for mastering or backup, £155, no offers ☎ 01933 678608.

ROLAND DIMENSION D rack mounting classic chorus unit, unique pyscho-acoustic sound, very quiet operation, very collectable, £500 ☎ Martin 01352 755286.

ROLAND DM80 4-track hard disk recorder, brand new, £550. ☎ Gary 0151 201 8490.

ROLAND DM800 HDR, with 14" colour monitor, keyboard and external drive, mint condition, £1700 ono. ☎ Gary 0181 386 8900.

ROLAND RE501 echo, £295, Korg SDD3300 delay, £250, Rocktron Intellife, £350, Boss FC50 foot control, £95, Carlsbro RM300 PA, £250; Fender Tonemaster complete, £1450 ☎ Paul 01204 593301.

ROLAND SDX330 Dimensional expander, £475, Yamaha TG77 module, £500; Shure SM81 studio condenser mic, case, £125 All immaculate. ☎ 01442 255992.

ROLAND SPACE ECHOS RE201, RE301, RE501, all in very good condition, serious offers only ☎ 01942 814818.

ROLAND VSS880 multitrack recorder as new, includes 1Gb HD and FX card, £1750 ☎ 0161 366 8744.

SANSUI MR6 6-track recording deck,

boxed as new, £350; Yamaha 1604 16:4:2 channel mixer, £450; Casio MG510 MIDI guitar, black, £275. ☎ 01202 427901.

SANSUI MX12 12-channel mixer, MR6 6-track cassette recorder, £395. Home use only, mint. ☎ 01254 394459.

SECK 18:8:2 mixing desk, excellent condition with manual, £560 ono. ☎ Rob 01394 285883.

SHURE UNIDYNE B mics, good condition, two at £30 each ☎ 01509 507148.

SOUNDCRAFT DELTA 200 32:4:2, £2500 ono, JD800, £100 with case, CD3000 10Mb, analog input board, £1400. ☎ 0171 261 0929.

SOUNDCRAFT SPIRIT STUDIO 16:8:2, £845; LA Audio 4x4, £210; Alesis 3630, £179, Aphex C2, £120; Art Multiverb Alpa SE, £179; Lexicon Reflex, £265; Sony DTC60ES DAT, £490. ☎ 0468 432558.

SOUNDCRAFT SPIRIT STUDIO 24:8:2, 6 band EQ, 4 auxilliaries, mint condition, £1350 ovno; Akai S1000 12Mb, new screen SCSI, £1000 ono ☎ 0468 852885.

SOUNDTRACS TOPAZ 24:8, original packing, complete with meter bridge, never used, £1995, H/H MA80 4-channel reverb head and 2 x pro 200 2x12+horn speakers, ideal small pub P.A, £295 P/X strat?, Fenix Stratocaster, candy apple red, Rosewood neck and trem, recent pro setup, A1 condition, great natural sustain £165; Quad 520 rackmount poweramps, two at £325 each ☎ 01323 736017.

SOUNDTRACS MRX 32:8:16 desk, immaculate, £2450, Lexicon LXP1, £200; Proteus 2, £340; Proteus 1 wit Protologic, £340, Proformance+, £220; Roland R8 with percussion card, £275, Steinberg Midex+, £170. ☎ 01274 488356.

SPIRIT ABSOLUTE 2 monitors, new unused, sell due to trouble with money, retail, £249 will accept, £195. ☎ 0171 720 3702.

SPIRIT FOLIO SI mixer, manual, good condition, £310, Yamaha EMP100 FX unit, £110; VU 4-band parametric EQ, £150; Revox B77 MkI, 7.5/15 ips, £350; Tascam 32, 7.5/15ips, £450. ☎ David 0973 513730.

SPIRIT FOLIO F1 mixer 16:2, brand new, boxed, very reluctant sale, £400 ono ☎ Rob 0161 256 1548.

SPIRIT STUDIO 16:8:2 mixer, home use only, £750; Waldorf Pulse rack synth, as new, boxed, £475. ☎ Steve 0116 237 6634 eves.

STARSOUND DYNAMIX 12:2 mixer, three band EQ, 2 aux sends, £140 ☎ Robert 01707 326704 after 7.30pm.

STARSOUND 12:2 mixer, 2 AUX, 3EQ, £110, Simms IMB 30 pin x 8, £5each ideal for Atari 1040 ST upgrade etc ☎ 01460 68157.

STUDIOMASTER DIAMOND 8:2, 8 channel mixer, literally brand new, unused in original packaging, £150. ☎ Alan 01494 533607 after 7.30pm (Bucks).

STUDIOMASTER MIXDOWN GOLD 16:2, swept mid EQ, four aux sends, inserts and direct outs on each channel, £450 ono. ☎ 01935 421031 eves/weekends.

STUDIOMASTER MIXDOWN GOLD 16:8:2 gives 40 channels on mixdown, full MIDI muting, 6 aux, 16 returns ☎ Andy 01733 370091.

STUDIOMASTER 16:2 good condition, £235 ☎ 01926 885390.

STUDIOMASTER SESSIONMIX 16:2, £300, Fostex 450 8:4/10:4 desk, £260, Audio Technica Pro 22 mic, £25,Yamaha DX100, £95, Akai XE8 drums, 2 cards, boxed, £130, Korg KPR77 analogue drums, case and manual, £120; Atari 1040 STFM, SM125 monitor, software, £220. ☎ 0121 622 2743.

STUDIOMASTER PROLINE 16:8 16:2 three band EQ, swept mid, four aux sends, MIDI mute on all channels and sends, excellent condition, £700. ☎ Chris 0181 579 0364.

TEAC V390CHX cassette deck, variable bias, Dolby HX Pro, £45, Technics SH8045 graphic, 10 band per channel, A1 condition, £45. ☎ Rob 0171 353 7418, 0171 737 6233.

TASCAM 8-TRACK vgc, includes remote, varispeed, Bel NR, cables, tapes and service manual, £650, Bulldog flightcases two at £50 each. ☎ 01342 323094.

TASCAM 38 8-track recorder, 1/2" tape, Bel noise reduction, light home use only, £550. ☎ Dave 0131 447 5279.

TASCAM 644 Midistudio, 16-channel mixer, sync, MIDI mutes etc. as new, £390, Casio DH100 MIDI horn, perfect, £80, Casio CSM10P sampled piano, £50, Akai EQ, £50 ☎ 01256 468208.

TASCAM 644 Midistudio, programmable, built in timecode, very reluctant sale, great condition, £550; FXR elite programmable digital multi-effects processor, great condition, £125. ☎ Chris 01703 671348.

TASCAM 688 Midistudio, 8-tracks with sync, home use only, 20 inputs with 2 auxs and swept EQ, £1000 ☎ Jake 0973 700643.

TASCAM 688 8-track, MIDI sync, 20 input mixer boxed, manual, upgrading, quick bargain, £700. ☎ Robb 01623 514777, 0115 9654 121 (Notts).

TASCAM TSR8 1/2" 8-track reel to reel, ex cond, manuals, box, CD quality, £825, Mackie, ex cond, manuals, £450. Together, with loom, £1200. ☎ Michael 0171 376 5825.

TASCAM 22-4 4-track open reel tape recorder 7.5/15ips, VUs, DX4D dbx, 6:4:2 mixer, looms owned since new, new 8 track forces sale, can split, sensible offers ☎ 01297 489259 (Dorset).

TASCAM 38 8-track, with remote control, Tascam DX20 noise reduction unit, hobby use only from new, offers over £600; Studiomaster 16:8:2 immaculate. ☎ 01803 523221.

TEAC DAP20 pro DAT, with bag, NICADs; Sony WMP6 pro cassette; Sony D7 DAT Walkman, Sony 8mm camcorder; Canon Hi 8 camcorder. All mint, bargain prices ☎ 0113 268 0331.

TC ELECTRONICS M5000 mainframe, excellent reverb, chorus, ambient programs etc, analogue and digital in and outs, boxed as new, £2000 ono. ☎ 01856 874785.

TELEX COPYETTE one on one fast dubbing machine, copies a C60 in two minutes, C90 in three minutes, good condition, £275 ☎ 01977 700047.

VALLEY PR2 compressor limiter de-esser as used in Abbey Road Studios, cost £1200, accept £550. ☎ 01565 633790.

WATKINS COPICAT 70s tape echo machine, a rare classic in great condition, £200 for quick sale. ☎ 01472 824196.

YAMAHA REV7professional effects unit, as new with manuals, £425 no offers ☎ 0181 902 9784.

YAMAHA REV7, £325; Yamaha RM50 with percussion card, £350; Matchbox MB10 DI box, £70; QED speaker switcher, £10, 3 metre Klotz 16-way ADAT loom, £30. ☎ 0181 902 9784.

YAMAHA PROMIX 01 digital mixer, 6 months old, boxed, immaculate, £1200, no offers. ☎ Andy 01926 888155.

YAMAHA PRO MIX 01 mixing desk, £1300 ono;Drawmer DS201 dual gate, £200 ono ☎ 01491 838869.

YAMAHA PROMIX 01 mixer as new, boxed with manual, £1300. ☎ 01923 710230.

YAMAHA PROMIX 01 as new, home use only, £1250, Alesis Midiverb 3, mint, £200, Opcode Studio 4, excellent condition, £325 ☎ 01494 556056, 0171 224 0920.

YAMAHA MT4X boxed with manual, well maintained, £290 ono, LA GCX2 compressor, brand new, £150; Mission Argonaut speakers, £300 ono ☎ John 01874 636784.

YAMAHA MT8X, £650; Roland S550, mouse, monitor, latest software, £550; XR300 synchronizer MTC/SMPTE, £120 ☎ Nick 0114 221 4235 (Sheffield).

SAMPLERS

AKAI SO1 sampler, home use only, £300 no offers ☎ Guy 01268 295192, 01268 544099.

AKAI SO1 sampler in mint condition, boxed with manual plus over 100 sample floppy disks, £350 ☎ Graeme 0161 797 4305.

AKAI S950 sampler, fully expanded to 2.25Mb, mint condition, one owner from new, includes all original disks and manuals, £650 ☎ Nick 01670 735061.

AKAI S950 fully expanded, £650; Roland Super JD990, £800; Bass Station, £250, Yamaha AM802 8-track mixer, £150. All top condition. ☎ Chris 0121 605 9283.

AKAI S1000PB 2Mb with 10 workstation discs, superb, £500 ono. Wanted: K4R, M1R, MC303, S4 Plus. ☎ 01472 310247.

AKAI S1000 8Mb SCSI, digital in out £995, Arp/Rhodes croma analogue monster £995; Yamaha CS70M £595; Sequential circuits studio 440 £695; Roland SBX80 sync box £250; Ensoniq mirage for spares £70; TR909 £975; Korg EX800 £140 ☎ 0181 3001857.

AKAI S1100 digital sampler 18Mb RAM, SMPTE board, in built effects, v4.3. loads S3000 series disks, immaculate condition, manuals, boxed, £1200 ono or swap for Behringer Eurodesk. ☎ 01384 410853.

AKAI S2800 10Mb, SCSI, MESA, effects, filters with resonance, immaculate, home use only, manual, boxed, £1200 ono. ☎ Matt 0181 472 8393.

AKAI S2800 10Mb, immaculate, boxed, manuals, £1000, Boss DR660 drum machine, excellent condition, £200;

Midiman Macman 1 in, 3 out MIDI interface, boxed, £40. ☎ Darren 01375 677332.

AKAI S900 latest version software, 100Mb sample library, £450 ☎ Charlie 01527 570465.

AKAI S950 vgc, manual, £500; Roland Alpha Juno 1, mint condition, flightcase, manual, £280, Realistic 6:2 stereo mixer, £45. No Offers. ☎ Martin 01244 376446.

AKAI S950 sampler, fully expanded, boxed as new, £800 ono; Yamaha RX5 drum machine, boxed as new, £300 ono. ☎ Steve 01243 263311.

AKAI S1000 sampler 8Mb digital I/0, SCSI, 11 outputs v4.3 software, manual, £1300. ☎ James 01978 362910.

AKAI S3000XL 32Mb, £1500; Roland JP8000, £1300; JV1080, £850; JD800 with flight, £1200, Elka EM22, £150, Emu Proteus 3, £300; Lexicon LXP1, £250 ☎ David 0151 709 8811.

AKAI S3000XL, £1500; Yamaha TG500 with two RAM cards, £550, Roland JD800 with full flight case, £1200; Emu Proteus 3, £300; Zoom 1202, £100. ☎ David 0151 709 8811.

AKAI S3200 16 Mb, MESA, home use only, one owner, boxed as new, £2795; Powermac 7100/66, Cubase Audio VST, 17" colour monitor, Opcode Studio 4, £1500 will split ☎ 01494 556056, 0171 224 0920.

AKAI S3200 16Mb, v1.5 light home use only, absolutely spotless, £2995; Atari ST 1Mb, SM125 monitor, Cubase Midex, 64 MIDI channels, mint condition, £395 ☎ John daytime 01494 556056, 0171 224 0920.

AKAI 3000XL 18Mb, EB16, Zip drive with eight cartridges, Rwmo CD ROM with headphones, all in excellent condition, one year old with all manuals and cables, £2200. ☎ 0171 1720 3702.

AKAI S2800 with SCSI board, mint condition, boxed with manual, £975 ono ☎ Lee 01702 347255 (Southend).

AKAI S2800 10Mb, huge screen, effects, resonant filters, immaculate, £950; XRI300 SMPTE to MIDI converter, £80 ☎ Tim 01535 600882.

AKAI S950 sampler, fully expanded, 8 outputs, includes manual and 200+ disk sample library, £675 ono ☎ Mark 01422 320147.

CHEETAH SX16 sampler, 16-bit, stereo inputs, eight outputs, reads Akai S950/S1000 disks, does MIDI sample dump. ☎ Simon 0161 737 4483.

EMAX SE rack sampler, stereo, plus 8 seperate outputs, onboard sequencer and arpeggiator, extensive analogue and digital processing, 175 disk library, £500 ☎ Dave 0131 447 5279.

EMU ESI32 sampler, 2Mb RAM, excellent condition, fantastic processing power, £710. ☎ Graham 01234 306346.

EMU EMAX II Turbo sampling keyboard 8Mb, loads of processing, £1000 ono ☎ Martin 01580 763094 (Kent).

ENSONIQ ASR10R sampler, mint condition with 8Mb RAM plus library, latest OS, reads Akai and Roland samples, £1300 ono. ☎ 0161 366 8744.

ENSONIQ EPS16+ Turbo keyboard, SCSI, flash memory, hard disk, library, all Waveboy software, flightcase, cables, accessories, £900 ono; Syquest 135Mb removable hard drive, £80. ☎ Dave 01224 232047.

ENSONIQ EPS 16-bit keyboard workstation sampler, multisampling, aftertouch, filters, patch control etc vgc including 100 disk sound library, £350 ☎ Jon 01566 784665.

KURZWEIL K2000 keyboard, upgraded with sampling option, excellent condition, £1795 ono; 32Mb Kurzweil sample RAM, £295 ono ☎ 01243 553364.

ROLAND DJ70 sampling keyboard, 4Mb, excellent condition, £700 ono, Wanted Emu SP12, Fostex M80. ☎ 01273 676153.

ROLAND DJ70 Sample workstation, 4Mb memory, good remix tool for DJ/producer, spanking condition, boxed with original manual, £950 ono ☎ Scott 01474 362594, 01474 538200 ext 2504.

ROLAND S750 18Mb RAM, colour monitor, 100Mb hard disk, excellent sample library, boxed with manual, £1250. ☎ Phil 01923 236502.

ROLAND S760 with OP760 upgrade, never used, £1300 ono; ARP Axxe, £250 ono; Roland JX3P with programmer, mint condition, £350 ono. Can arrange delivery ☎ 0141 221 1808.

ROLAND S760 sampler with digital in/out and video out expansion board. 19Mb memory and Roland hi-res colour monitor, manuals, excellent condition, £1550. ☎ 01825 724093.

ROLAND W30 workstation, complete with manual and loads of samples on

disks, mint condition, £750, Alesis 16-track mixer, £350. ☎ 01384 850021

ROLAND W30 sampler workstation, loads of disks as new, £730, 14U rack, lockable, castors, £120; 2Mb Atari upgrade, deluxe kit never opened, £40. ☎ Richard 0113 294 5649.

ROLAND MS1 digital sampler would like to swap for good drum machine DR660, Drum Station or synth, cash either way ☎ 01529 413018.

ROLAND S760 with 32Mb RAM, 280 Mb magneto optical drive, CD ROM drive and three CD ROM disks, £1750. ☎ 01787 476108 (Essex).

S200 SAMPLER Evolution keyboard, mixer, R8 drum machine, Atari 1MB, Cubase, video, CD player, JVC hi-fi, monitor, offers ☎ Matt 01376 328597.

COMPUTERS/SOFTWARE

APPLE MAC Performa 600 8/80, CD, monitor, mouse, keyboard, Cubase, Digidesign II, 16Mb external drive, complete setup ready to use, £1100 ono ☎ Chris 01296 386043.

APPLE POWER MAC 7200/75 15 inch Apple monitor, keyboard, mouse, altech Midiface 3/1. Emagic Logic 2.5. , boxed, manuals and dongle as new, £1500 ☎ 01844 351120.

ATARI 4MB 60MB external hard drive, high res monitor, mouse, recently serviced, £250 ☎ 0161 429 7469.

ATARI 1040 STE 1Mb, SM124 monitor, £220 ono ☎ Chris 0181 894 7306.

ATARI 520 STFM with Marpet memory expansion board and 1Mb installed, can be easily upgraded to 4Mb, sorry, no monitor, £110. ☎ 01354 695239.

ATARI 520 STFM with 1MB RAM installed, SM124 mono monitor and software, £220, C Lab Notator SL v3.1 manual, original disks, dongle, £100. ☎ Bill 01590 677162.

ATARI 520 STFM with 1Mb upgrade, hi-res monitor and Steinberg Cubeat, plus a bunch of free games, £200. ☎ Andy 0802 426765.

ATARI ST sequencing set up, nice system, hi-res monitor, leads, accessories etc, complete, was used with Cubase, editors, librarians and sampling, £200 ono. ☎ 01884 257487.

ATARI ST computer with hi-res monitor, sequencing software, extras, complete MIDI system, £195; Korg M1 synth, £560, MC303 Groovebox, £500, Wanted CS1x and Digitech Studio Quad ☎ 01252 372940.

ATARI 1040 STE mint condition with original box and software, hardly used, £200 ☎ Pete 01522 889739.

ATARI ST1040 SM125 hi res monitor, includes music software, games and loads of extras, excellent condition, £250 ☎ Keith 01703 320966.

ATARI 1040STE 4MB RAM, hi res monitor, 80Mb hard disk, stereo colour monitor, loads software, mags, £350 ono, Roland SC33 GM/GS sound module, £140 ono ☎ Neil 01273 387434.

ATARI MEGA4 4Mb RAM, 200Mb hard disk, Atari monochrome monitor, external floppy drive, music and games software, £300 ☎ Gordon 0141 634 1027.

ATARI STFM 1Mb with Breakthrough software sequencer & score printing kit, boxed original, £150; Yamaha PSS51 multitimbral MIDI keyboard, £125; Casio CZ230S MIDI synth, £50; Yamaha RX8, £70. ☎ Robin 01305 785675.

CODA FINALE for windows, the most powerful music notation software available for the PC, as new, boxed, £250 ono ☎ 01734 722747.

CREATOR FOR ATARI brand new v3.1, £120 ☎ 0973 814745.

CUBASE SCORE for Windows v3, genuine package with dongle, manuals, CD and registration form, DTP score MIDI and audio for the PC, £300 ☎ 01993 812739.

CUBASE SCORE VST for Mac, genuine package with installs, manuals, CD and registration form DTP score MIDI and audio for the Mac, £300 ☎ 01993 812739.

CUBASE 2.5 Mac version, original UK version upgradeable to VST, £120 ono ☎ 0171 480 6528.

HARD DISK recording software for Atari Falcon, 4TFX/D2D, £75 ☎ Chris 01509 507188.

MIDIMAN D-MAN digital audio card with MIDI interface complete with Samplitude and SAW digital audio software, £195 ☎ 01202 427901.

POWERMAC 7100/66 CD ROM, Trinitron 17" colour monitor, Opcode Studio 4, Steinberg Cubase Audio, Cubase VST, home use only, £1500 will split ☎ John 01494 556056, 0171 224 0920.

POWER PC 710/66AV, 40 Mb RAM, 350Mb 110, 256KL2, drives 2 monitors at once 14" Trinitron monitor, keyboard,

mouse, £1200 the lot, Power CD player connect to TV, £55 ☎ 01276 62780 after 6pm.

REPLAY 16 SAMPLER 16-bit 48kHz sampling for the Atari ST and Falcon, box, manual and catridge, £40. ☎ Jason 01206 45714 eves/weekend.

STEINBERG CUBASE Audio DAE v2.04 Apple Mac version, mint, easily upgraded to Power PC, £375 ono ☎ 0161 721 4516 or 0161 764 3041.

STEINBERG M1 SYNTHWORKS genuine package with dongle and manual also compatible with all M-series and T-series, £50. ☎ 01993 812739.

STEINBERG SMP24 SMPTE/MIDI processor which gives 64 extra MIDI channels plus timecode sync for multitrack machines on Cubase for Atari ST/STE/Falcon computers, £495. ☎ 0181 883 4329

STEINBERG SYNTHWORKS Editor/ Librarian on Atari ST/STE/ Falcon computers for Roland D5/D10/D20/D110/MT32, £60, Synthworks for Kawai K1/K1MkII, £60 or both for £100 with dongle and manual included ☎ 0181 883 4329.

STEINBERG AVALON 16-bit D/A stereo converter plus Steinberg Avalon V2.1 universal sample editor software for Atari ST/STF computers with dongle and manual, cost, £700 sell for, £295. ☎ 0181 883 4329.

STEINBERG CUBASE SCORE new v2.0 registered but not used, reason for sale won same in a competition after purchase, hence price, £345. ☎ 01332 512228.

TURTLE BEACH TBS2000 sound card, boxed plus MIDI cable, £130. ☎ Tim 01474 703304.

VOYETRA DIGITAL ORCHESTRATOR plus Windows, CD-ROM, multitrack digital audio recorder and MIDI sequencer with musical notation, £90. ☎ 0181 643 8381.

DRUM MACHINES

ALESIS SR16 boxed, immac cond, complete with manuals and video manual, £150 no offers ☎ Paul 0113 232 0537.

ALESIS SR16 drum machine, great sounds, excellent condition, boxed with manuals, £150 ☎ Nick 0131 446 9072.

ALESIS SR16 drum box in good condition with all the bits, loadsa sounds, £140. ☎ 01933 678608.

BOSS DR660 excellent home use only, £250, ART MIDI multi effects inc. auto sampler, EQ, reverbs etc., £250. Both boxed with manuals ☎ 01373 832310.

BOSS DR660 with manual and power supply, tons of sounds and kits (inc 808/909) reverb, chorus, £210. ☎ 01933 678608.

BOSS DR5 rhythm unit, boxed, manual as new, £200 ☎ 01792 368786.

LINN DRUM MKI, all excellent in flight case, retro classic, £275 ono, Roland TR626 latin and kit sounds, £125, Garfield Mini Doc sync pulse generator, £50 ☎ 0181 870 3880.

NOVATION DRUM STATION rack, brand new, mint, £360 ☎ Rob 0161 256 1548.

ROLAND CR78 probably the original drum machine, with rare WS1 write switch and manual, make me an offer ☎ Mark 01273 553833.

ROLAND R70 Human Rhythm composer with extra RAM card, manuals, £320 ☎ Iain 01562 710552.

ROLAND TR909 drum machine as new condition, cartridge and manual, £1500. ☎ 01902 657223.

ELECTRONIC DRUM KIT Alesis D4, five Simmons pads including bass and stands, two Roland PO5 pads, £495 ☎ 01202 667750, 251834 (Dorset).

ROLAND R8M mint condition includes cards, £325, DX7, good condition, £225. Swap both for Korg M1 ☎ 0468 213561.

ROLAND TR606, £100, R8 multitrack, £750, ORLA DMK7 keyboard, £230, Yamaha MT120, £250, Crown PZM, £200, Tenor sax, £500, Rotel RHA10 pre-amp, £700, consider P/X for XP50. ☎ 0181 211 8140.

ROLAND TR808 with original manuals, £450, Korg KMS30 MIDI synchronizer, no need for retrofit, £120. Sell both for, £500 ☎ Bob 01933 380926.

SCI DRUMTRAKS vgc, a classic with original and TR909 soundchips, £150, Wasp synth, classic analogue, £400, Bokse SM9 remote, £50, Aphex type B, £150 ☎ 01342 323094.

YAMAHA RY10 drums and bass machine includes power supply and over 30 song programs, £110 ono. ☎ Tony 0151 6061763.

SEQUENCERS

AKAI MPC300 010Mb memory, SMPTE option, flight case, mint , library, £2000. ☎ 0171 254 8384.

AKAI MPC3000 sampling drum machine,

sequencer Expanded Memory SMPTE board and Video board boxed as new, £1800 ono ☎ 01856 874785.

ALESIS DATADISKS latest version software, home use only, two at £200 each. ☎ Charlie 01527 570465.

ALESIS MMT8 8-track sequencer, boxed with manual, unused, excellent order, £125. ☎ 01992 712475.

ROLAND MC202 analogue micro composer, excellent condition with manual and PSU, £275; Roland SBX10, £100; Roland MC50, £275 ☎ Stephen 0181 767 5497.

ROLAND MC303 Groove Box. You know the spec! Boxed with manual, 6 weeks use, immaculate, £475 or £490 with aluminium hard case. ☎ 01384 410853.

ROLAND MC303 £489; Folio Notepad mixer, £159, Yamaha SU10 sampler, £210, Cakewalk Home Studio for PC, £85. All boxed as new ☎ Paul 01732 455790.

ROLAND MC303 4 months old. Why wait for the shops to get them in, buy mine, £450. ☎ 0831 579550.

ROLAND MC303 mint, £495, Atari ST, mono monitor, Cubase, complete setup, £190; Roland PC200 MkII controller, £95, Moog Prodigy, £235; Korg Poly 6, flightcase, £340; M1, £550 ☎ 01252 372940.

ROLAND MV30 music production system, 16-track sequencer/sound module, disk drive reads and writes standard MIDI files, £450. ☎ Andy 0161 725 8130.

ROLAND TB303 with Kenton refit, carry case, £800 ☎ 0113 275 1267 after 4.30pm.

ROLAND TB303 Bassline, good condition with carry case and manual, £560 inc postage. ☎ 01933 678608.

ROLAND TB303 with manual, case, £850, Sequential Pro One mono synth, manual, £365; SH09 mono synth, £185, Roland MkII drum machine 909/808 sounds, £550 ☎ 0151 353 0394.

YAMAHA QY10 pocket workstation sequencer, 30 voices, 26 drum sounds, 8 songs, 28 note poly, 76 preset backing patterns, boxed manuals, unused gift, £120. ☎ 0181 444 0435.

YAMAHA QY300 16-track sequencer, includes large sound bank, disk drive, excellent condition, £510; Yamaha MT2X 4-track cassette multitrack, 6 inputs, dbx, twin tape speed, £250 ☎ 01484 478892.

YAMAHA QY300 with start/stop function by MIDI solution, indoor use only, manuals, lots of special features, £575 ☎ George 0181 933 3248.

YAMAHA QY20 sound module/sequencer, complete with video manual, carrying case, Atari editor boxed as new, £200. ☎ Keith 01703 329966.

MISCELLANEOUS

CARLSBRO COBRA keyboard amplifier, five inputs, effects loop, 90 watts includes cover, reverb and reverb footswitch, £210 ☎ 01977 791770.

CARVER PM15 1200 watt stereo power amplifier; H & H MX900 900watt stereo amplifier fully professional amps selling to upgrade, £425 each ono. ☎ Mick 0121 525 1832.

CASIO MIDI GUITAR onboard sounds, card slot, tuner, octaves etc strat type black, recently serviced, £300. ☎ 01484 541357.

CASIO PG380 guitar MIDI controller, black, 2 singles, 1 tapped humbucker, Floyd Rose, full MIDI spec, hard case, PSU, rare and immaculate, £650, no offers ☎ 0191 265 5980.

EMS VOCODER 1000 circa 1976, very rare piece of analogue equipment as used by Herbie Hancock, good condition with manual, serious offers only ☎ Graham 01942 814818.

ENSONIQ ASR10 memory 1Mb X2, DRAM SIMMs 30 pin, £60 ono ☎ Justin 01782 868826.

GALLIEN KRUGER MK200, 100W combo, American amp 3 channels stereo reverb chorus limiter compressor, lightweight, fits into a handbag, snip at, £600 hardly used. ☎ Shad 01294 218355.

KIT SELECTOR for d drum 2, £75, or P/X for drum rack. ☎ 01933 678608.

LANEY KD100 100W keyboard combo, 3 inputs, effects, rugged, vgc, £180 ono ☎ Andy 01203 683385.

LIGHT ENGINEERING 'Stomper' foot operated lighting controller, chase patterns, blackout, audio in etc, one faulty channel hence, £50; CCTV system as new, £95 ☎ 01933 678608.

LONG DESK 10'3" x 2'2" includes horizontal 10U rack and robust metal legs, finished in smart black, very tidy condition, bargain, £140. ☎ Bobby 01703 493441.

MIDIMAN SYNCMAN SMPTE syncronizer, hardly used, boxed with manual, £60. ☎

Mark 01422 320147 anytime.

PATCH BAYS Bantam type 96 way professional Ex BT A1 condition only, £95, never used. ☎ Rob 0171 353 7418 / 7376233 (London).

PEARL HIGH HAT used but ideal for beginner, £30 ono ☎ 01993 812739.

PEAVEY COMBO 300 bass amp, 220/40w, loud and crisp, pre/post, gain controls, EQ and various outputs, crossover, 15 inch, Black Widow cone, excellent condition, £300 ono ☎ 01536 725518 after 6pm.

RACK FLIGHT CASE 16U on wheels, front and back lids with handles and vents, vgc, £150. ☎ 01993 812739.

ROLAND SBX10 sync box, converts between MIDI, Sync24 and timebase, ideal for syncing analogue drum machines to MIDI, £100. ☎ Stephen 0181 767 5497.

ROLAND PK5 MIDI foot pedals with case, PSU, manual, lead, vgc, £195. ☎ 01202 557402, 737473 (Bournmouth).

SPEAKER CAB 15"+12"+1", RCF Loaded, £180; 4-way DI, 1U, 19", £90; WEM Copicat, offers, Alesis 2x15 graphic, £60; Boss RE1000 reverb echo 19" IU, £90 Lyon F Forge power amp 2x350W, 4ohms, £230; 22" bass drum case, £25. ☎ Steve 01277 630283 (Essex).

TRANTEC S1000 radio mic, excellent condition, £145, Yamaha FB01, home use only, £75 ono. ☎ Mike 01908 662551, 324719.

PERSONNEL

ARE YOU THE NEXT MADONNA? writer/producer desperately seeking collaborator/singer, dreamer welcome ☎ Bjorn 0181 992 0418.

A+R AGENCY representing a range of dance labels, require artists with good quality demos. All dance/electronic genres, inc SAE: Fu-Phonic, PO Box 10503, London N22 6TQ.

BUDDING PRODUCER/PROGRAMMER Newcastle area, seeks floor sweeping/tea making experience in local studio, in return for production/engineering work. ☎ Roger 0191 2514427.

COLLABORATOR REQUIRED musician in Halesowen, W Midlands, writing, recording, influences Autechre, AFX, Plu, Tortoise. Open-mind and enthusiasm important. ☎ Richard 0121 550 6699.

ESTABLISHED record company looking to license hard house/techno artists in UK overseas labels/artists should send tracks/test pressings to: A+R Dept, P.O. Box 7612, London NW6 6HF England.

FEMALE VOCALIST/SONGWRITER required for electronic band, experience not essential, attitude and dedocation a must, own equipment an advantage ☎ Tim 0161 626 0576 (Manchester area).

HOUSE/POP producers seek female singers in the style of Living Joy/JX. Must look the part. Send photo and demos to: Uptight Studios, 157 Ewell Road, Surbiton, Surrey, KT6 6AR. ☎ Trevan 0589 831458.

HYBRID RECORDINGS requires your demos, all types of dance and club music, DATS or audio tapes, send to: Rockington Nursery, Blackness Road, Crowborough, E. Sussex TN6 2NB.

MALE SINGER wanted to collaborate with songwriter/programmer. Good setup and own material. Mainly rock influences ie REM, total commitment to the cause only ☎ 01803 732 773.

MANAGER REQUIRED for drum and bass type act, if you are interested please write to Brain Foundation, Pump Row Cottages, Broad Oak, Hereford, HR2 8QU.

NEW ELECTRO FUNK/DISCO orientated tracks/demos and relevant information for future projects. Send to: PO Box 13974, London N8 0WD.

SIGNED ARTIST needs remixers, any style. Fancy doing a remix thru the post? May be released but no promises! Demo tapes and DATS to: Ultrawave, 4 Rossiter House, Penzance, TR19 7AD.

STUPH RECORDS require original master triphop, drum & bass tracks for compilation CD, anything interesting and different. Send tapes to 26a Highgate Avenue, Birstall, Leicester LE4 3JJ.

TO ALL A&R agencies, if you want the best new duo since Eurasure and the Pet Shop Boys with the one and only worm song ☎ 01977 600594.

TRANCEMISSION RECORDS require innovative trance/techno tracks, submit your demo and info to Trancemission Records, P O Box 4317, 6202 VA Maastricht, The Netherlands (Please enclose 1 international reply coupon for sure reply).

TRULY TASTY RECORDINGS LTD Require demos, trance, house, techno, chemical style, hip hop 20 Rennies Court, Aberdeen, AB11 6NZ.

WANTED

AKAI MPC60 MKII drum machine required, cash waiting ☎ 0181 883 4329 or 0956 339577.

AKAI MPC60 preferably upgraded, money waiting. ☎ 01273 889374.

AKAI S900 sample editor for Atari, preferably graphical, anything considered, cheap as possible, Prophecy editor or Cubase mixer map. ☎ Alan 01942 749868.

AKAI S2800 sampler, will pay £600; portable DAT recorder, will pay £150; Mutronics Mutator, will pay £350; Proteus World £200, Marion Pro Synth £200; SPL Vitalizer £200, MIDI to CV Convertor, £50. ☎ 01243 830697.

AKAI S2800 8Mb must be in good condition with manuals, will pay £800 ☎ Neil 01383 624494.

ANALOGUE WANTED TR606, TR707, TR727, £75, SH101, MC202, Wasp, Gnat, £150; TR808, £300, TB303, £450; Oscar, Jupiter 6, £500, TR909, £650 ☎ Kevin 01353 663613.

ANALOGUE SYNTHS ARP Axxe, Odyssey, 2600, Oscar, Kat, Kitten, Moog, Source, Polymoog, Memorymoog, Prophet 5, Wasp, Gnat, SH05, SH07, CR78 or anything interesting ☎ Graham 01942 814818.

ELKA RHAPSODY strings/piano in full working order, around £100 paid dependent on condition. Non-working model considered at nominal price, other string machines considered ☎ 01952 260064 (Telford).

EMU E64 sampler wanted, must be in brand new condition. Cash waiting. ☎ 01432 760613.

ENSONIQ ME16+ memory expansion together with SP2 SCSI, hard drive, interface will pay, £220; FB2 Flashbank required, £100, all prices negotiable ☎ Paul 01133 232 0537.

ENSONIQ EPS 4x memory expansion with SCSI wanted. Willing to pay good cash for one. ☎ 01926 435056.

HUMAN TOUCH audio trigger interface, Atari hard disc drive, hi-res monitor, JV1080. ☎ Jamie 01628 526562.

JUNO 106 and Midiverb III wanted, cash waiting. ☎ 01432 342343.

KORG BX3 dual manual organ in roadworthy and reliable condition, can collect, cash waiting ☎ Henry 0181 840 3249 eves.

KORG MS20 Sequential Pro One and Oscar wanted, interesting analogue also considered. Cash waiting can collect around london. ☎ 0973 2944 204.

KORG PROPHECY must be in excellent condition can pay £720. For sale Roland Juno 106, £420, Korg MS20, £420 both excellent condition ☎ Ben 01280 814385.

MOOG SONIC SIX plastic briefcase synth ☎ 0121 771 1628 eves.

PROPHET VS ROM cartridges 1, 3 and 4, also RAM cartridge wanted ☎ 181 8834098 (South Africa).

ROLAND A30 or A33 master keyboard wanted. Interested in any Roland analogue gear. Cash waiting ☎ Rikki 01266 49850.

ROLAND MC50 MKII sequencer, must be good condition, will collect ☎ 01934 712948.

ROLAND TR707/TR727 drum machines wanted around, £75 paid dependent on condition; Roland SPDII wanted in very good condition ☎ 01952 260064 (Telford).

ROLAND JD800 and Sequential Circuits Drumtrax for my Gibson ES335 with original case, mint condition, cost £1800 new ☎ 0161 721 4516 (Manchester).

SCRAP SEQUENTIAL PRO ONE wanted for knobs and wheels ☎ 01352 712937.

SEQUENCER Alesis MMTS or QY10 or other ☎ 01223 563862.

SONY GP5 foot controller wanted. ☎ 01734 312989.

SONY HRGP5 effects unit wanted ☎ Martin 01424 221756.

STUDIOMASTER SERIES 2 expander modules wanted for 24.16.2 desk or old desk for parts preferably with MIDI muting ☎ Jez 01372 729337.

TASCAM PORTA ONE ☎ 01203 418088.

WANTED KORG T1 complete with sound boards and manual ☎ 01299 266702 after 6pm.

WANTED URGENTLY Atari editor & manual for Evolution EVS1 and Yamaha FB01, cash waiting ☎ 01304 204822.

WANTED TB303 any condition, £400 ono For good one ☎ 0468 728279.

WANTED RAM MEMORY CARD for Roland R8 will pay realistic price ☎ Leo 0161 448 9778 (Tues, Thurs & Weekends).

WANTED YAMAHA QX3 sequencer complete with manual ☎ 01299 266702 after 6pm.

YAMAHA CS01 MkII, perfect ☎ 01227 711628 eves.

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by Peter Mclan & Larry Wichman
(Revised and Updated)
This is the book every serious songwriter, musician, and home recordist needs, with a new chapter on MIDI and the lastest digital recording technologies. A problem-solving guide as well as an instructional text, it is designed to explain in simple terms how professional recording techniques can be applied at home.

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by Rudy Trubitt
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PRACTICAL STUDIO TECHNIQUES

by Tom Misner
This book and audio CD package comes from the School of Audio Engineering's Tom Misner. It's an excellent source of basic recording facts and figures, and if you want concrete examples of the subjects discussed, then listen to the free mixdown demonstration CD.

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TIPS FOR RECORDING MUSICIANS

by John Harris
Today's studio equipment is affordable but sophisticated, and it takes a lot of know-how to use all this technology effectively. This book details the equipment you need - mics, effects, tape machines, etc. It has separate sections on recording of vocals, electric guitar, drums and acoustic instruments, as well as the use of MIDI in the recording process. You will learn how to get the best from delay and reverb, as well as effects like compression and gating. There are some useful tips on using the mixing desk and post production work. All in all it's a handy guide that will improve your recording techniques at a stroke.

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RECORDING TECHNIQUES FOR SMALL STUDIOS

by David Mellor
This well written, user-friendly book is designed to offer accessible and helpful tips on how to get the most out of the equipment in your studio. Chapters cover: mic techniques; musical arranging for recording; 4-track recording; the mixer; preparing for an running a session; recording drums; recording vocals; integrating MIDI; using effects and signal processing; location recording, and digital recording. The book is rounded off with an "any questions" section, a glossary and a list of recording studios in the UK. As you would expect from a book based on an SOS series, this is a *must have*!

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HOW TO SET UP A HOME RECORDING STUDIO

UPDATED & EXPANDED

By David Mellor
If you are thinking of setting up a home studio, a project studio or a DJ studio, this book is the place to start. It takes a highly practical 'nuts and bolts' type of aproach to help you produce an efficient and productive studio. It covers soundproofing, keeping the sound in and the noise out, acoustics, studio layout, and studio equipment, and the advice on the kit you are likely to need. The book ends with an invaluable questions and answers section, a glossary of terms and a list of contacts.

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By Freff
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SUCCESSFUL LYRIC WRITING
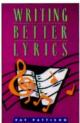
by Sheila Davis
Superb guide to the art of writing words to music. Learn how to create a memorable song title, choose the best music form for each idea, apply writing principles and avoid common pitfalls, write with both sides of your brain, find your voice. Includes songwriter's bibliography and lists over 60 songwriting organisations to help you connect with your chosen marketplace.

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MUSIC PUBLISHING

by Randy Poe
This book demystifies music publishing, explaining what it's all about and what it means to a songwriter. Learn what your publishing options are, from a single song contract to a staff writer to a self-publishing operation. By the time you have finished this book you will never make an uninformed decision about publishing your songs that you will later regret.

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SONGWRITERS MARKET 1997

To get your songs published and produced, you must know who the music industry's players are and how to approach them. This directory identifies those seeking the work of songwriters. Lists 2500 lyric and music markets, clubs, associations, contests, workshops and songwriters publications. Includes 'The A & R Roundtable', where pros discuss their role in a songwriter's career, business side of songwriting, music industry trend report, and interviews with music industry professionals.

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88 SONGWRITING WRONGS & HOW TO RIGHT THEM

by Pat & Pete Luboff
This is a real workbook for songwriters, dealing with both the craft and art of songwriting. Song structure, rewriting, matching lyrics to music, collaboration, making the right demo, pitching the final result, and business matters.

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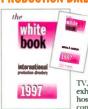
CAN YOU SING A HIGH "C" WITHOUT STRAINING

by Thomas Appell
This book features extensive coverage of the vocal cords and explains clearly how to sing high notes without going into falsetto, and without straining. You'll learn how to extend the range of your voice, and why most singers either strain or "break" into falsetto when attempting to sing above their normal range. It comes with 2 CD's jam-packed with over 2 hours of vocal examples and exercises that you can practice with. Many singers have increased their range by several notes after the first week of practice. If you can't sing high notes without straining, but would like to know how, then this book is for you. 122 pages.

CODE B319 **£24.95**
Postage: UK £3.50, Europe £5.50, R.O.W. £8.50

THE WHITE BOOK INTERNATIONAL PRODUCTION DIRECTORY 1997

This is the latest edition of the essential source of contacts for artists, performers, venues, services and facilities associated with music, concerts, shows, festivals, film, TV, video, conferences, exhibitions and corporate hospitality - there's even a comprehensive international section. The layout is logical and an index makes fact finding an easy task - altogether an indispensable 864 pages. The new edition once again comes with a complementary copy of The Little White Book, which distils the contents of the larger volume to a pocket-sized list of names and phone numbers.

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SONGWRITER'S WORKSHOP

Edited by Harvey Rachlin
If you want to work systematically at improving your songwriting skills, then try this book: it's divided into four individual 'lessons', each of which is backed up by audio material on cassette. This allows you to listen in the car or walk around and still absorb useful information. The four sections are: On Songwriting by Janis Ian (yes, *the* Janis Ian); Making Demos by John Barilla; Understanding MIDI by James Becher; and The Art of Pitching Songs by Teri Muench (ex-A&R director with RCA and publisher). Also included is an intro, a quick and breezy glossary and an index. Includes two cassettes.

CODE B260 **£15.95**
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

SHOWCASE INTERNATIONAL MUSIC BOOK 1997

"The Bible of the music industry" - all the contacts you need in one handy volume. 544 pages, thoroughly researched and totally updated. This is the book the professionals within the industry use to find studios, producers, manufacturers, record companies, publishers, management, promoters, venues, tour support services, etc. UK, plus sections of Europe, Middle East, USA/Canada, Australia, South Africa. Accurate, comprehensive information in a well thought out and easy to use format. Highly recommended.

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CREATING MELODIES

by Dick Weissman
Learn how to create memorable melodies, from love ballads to film scores and jingles. Using lots of examples of popular songs and styles by top-name musicians, Weissman covers the full range of melody writing. Learn how to marry music to lyrics, relate rhythm to the message of your song, read and write musical notation, write instrumentals for films, TV, commercials and theatre, and put together a demo tape.

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Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

THE SONGWRITER'S GUIDE TO COLLABORATION

by Walter Carter
This book describes what to expect when entering into a co-writing situation and how to make the arrangement work. Covers the pros and cons, how to find a partner, publishing your songs, who writes what, money matters, sharing success and rejection, growing together or apart plus co-producing and pitching.

CODE B323   **£8.95**
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

NETWORKING IN THE MUSIC BUSINESS

by Dan Kimpel
Think of this book as a popular psychology course for musicians. If you feel you could benefit from developing a positive attitude to getting ahead in your area of the music business, then *Networking* is for you. There's nothing like it for good, sensible advice: it's often not enough to have talent. To be successful, you'll need to persevere, have good "people skills", and exercise good networking skills. Success depends on what you know, who you know, and perhaps most importantly, who knows you. An essential book, and a snip at £11.95. Hardback.

CODE B251   **£11.95**
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

BEGINNING SONGWRITER'S ANSWER BOOK by Paul Zollo

If you're just starting out as a songwriter or haven't progressed very far, perhaps you have questions about the art and business of songwriting that you can't find answers for. Chances are, they're covered in this book. Over 200 of the questions songwriters most often ask are answered in this book. There are 11 chapters, covering subjects such as lyrics, theory, song structure, collaboration, demos, publishing and the music business. Some answers - such as "What makes a professional-sounding demo?" are actually mini-articles - and an index allows you to target subjects without wading through the text. A friendly, informative read.

CODE B253   **£10.95**
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

ALL YOU NEED TO KNOW ABOUT THE MUSIC BUSINESS

by Donald S Passman
This book is a must: the author manages a portfolio of high profile clients and teaches music business law at the University of Southern California, and has produced a clear overview of the music business. He starts at the beginning of your career, with advice on choosing a manager, lawyer and agent, and moves through getting a record deal, songwriting and music publishing and finishes with details of copyright, mechanical royalties, songwriter deals, films and more. An exhaustive and entertaining read. 415 Pages.

CODE B302   **£19.99**
Postage: UK £3.50, Europe £5.50, R.O.W. £8.50

THE SONGWRITER'S MARKET GUIDE TO SONG & DEMO SUBMISSION FORMATS

From the Editors of Songwriter's Market
If you've got the songs and you've got the contacts, this book will help you to choose a format that will get your demo heard as well as overall packaging and presentation and dealing professionally with publishers, A&R reps and other industry people. Plenty of example documents (lyric sheets and letters) are given, and the book is nicely rounded off with a glossary and index. Hardback.

CODE B258   **£12.95**
Postage: UK £2.50, Europe £5.95, R.O.W. £9.95

THE MUSICIAN'S GUIDE TO READING & WRITING MUSIC

It's an entertaining but practical introduction, well, to reading and writing music. This is as friendly as it comes. Learning to read and write music isn't easy, but at least the process is lightened up with considerable doses of wit.

CODE B224   **£8.99**
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

SONGWRITERS IDEA BOOK

by Sheila Davis
If you want a textbook, this is it: 250 pages of serious, intelligent insight into songwriting. Loads of good advice and a friendly tone make this a useful read to anyone, whether beginner or seasoned pro. The focus is firmly on lyrics rather than music, and the prominent references to poetry terminology shouldn't really be a surprise. Use Davis' 40 strategies and you could soon be "designing distinctive songs". Hardback.

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SINGING FOR A LIVING

by Marta Woodhull
The title says it all. If you're already a singer, this book gives you everything you need to know in order to exploit your talent further: looking after your voice and voice exercises, business advice and marketing and audience interaction are all covered in this straightforward book.

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Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

MIDI INFORMATION

THE MIDI FILES   NEW

By Rob Young
This book comes from Prentice Hall and aims to help you get the most out of your MIDI system, by providing loads of tips on programming realistic instrument and rhythm parts, using sequencers to create advanced effects. Basic MIDI concepts are covered, along with advice on setting up a MIDI-based home studio. More advanced discussions cover specific types of MIDI messages and what you can achieve with them. All the techniques in the book are illustrated on a supplied floppy disk.

CODE B334   **£19.95**
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MAKING THE MOST OF MIDI

By Paul Overaa
This is a MIDI book unlike any other. It explains the fundamentals of MIDI and MIDI sequencing for the beginner, and it goes much further, dealing with issues that will be of help to more established users. Advice on MIDI fault finding, help for musicians using sequencers with live bands, MIDI messages and MIDI files, plus programming material. So if you are a keen first time user or a MIDI veteran, there will be something in this book to interest you.

CODE B321   **£14.95**
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

HANDBOOK OF MIDI   NEW
SEQUENCING
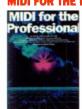
by Dave Clackett
Hands On MIDI Software's Dave Clackett has boiled his knowledge into a collection of tips for getting the best out of hardware or software sequencers. Dave covers the hardware and software you need to get sequencing, and introduces the basics of sequencing and notation, with particular emphasis placed on using General MIDI/GX/XG sound sources. Recommended.

CODE B333   **£13.95**
Postage: UK £2.50, Europe £4.95, R.O.W. £7.50

MIDI FOR THE PROFESSIONAL

by Paul D Lehrman and Tim Tully
Co-written by SOS contributor Paul D Lehrman, this substantial, exhaustive work covers pretty well any aspect of MIDI that you could think of. As an overview of what MIDI is and does in 1994, this 239 page book couldn't be better.

CODE B227   **£11.95**
Postage: UK £4.50, Europe £7.50, R.O.W. £14.50

PRACTICAL MIDI HANDBOOK (3rd Edition)

by R A Penfold
This book is completely updated, and features a section on General MIDI. It provides a "straightforward, non-mathematical introduction to MIDI", and features a full glossary of MIDI terms.

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ADVANCED MIDI USER'S GUIDE (2nd Edition)

by R A Penfold
Most MIDI users do no more than scratch the surface of MIDI's potentialities. But dare to dig a bit deeper and you'll find a whole new world of creative possibilities. With the Advanced MIDI User's Guide, you'll learn how to optimise your MIDI system to get the best results from your particular setup, and you'll find out how to use gadgets like switchers and mergers to enhance your system. If you want to incorporate a multitrack tape recorder into your MIDI system there's a section on synchronisers, SMPTE and MIDI time code, and retro freaks will learn how to hook up that dusty old analogue synth to their MIDI systems.

CODE B152   **£10.95**
Postage: UK £1.95, Europe £3.95, R.O.W. £5.50

MUSIC TECHNOLOGY REFERENCE BOOK

by Peter Buick & Vic Lennard
Written by Peter Buick and Vic Lennard (author of SOS's Atari Notes column), this book offers information at your fingertips and is an indispensable reference source for the musician or sound professional in the recording, broadcast, live, video, computer, multimedia, post production and theatre industries. It includes comprehensive MIDI spec, General MIDI, MTC, MSC, and SysEx information. It also includes charts, check lists, useful hints, tips, and ideas, plus a glossary, list of contacts and a comprehensive indexed, it is also organised into convenient sections. 150 Pages.

CODE B305   **£12.95**
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

A BEGINNERS GUIDE TO MIDI

by RA Penfold
The title says it all: al' aspects of MIDI are explained, and many common beginner's problems are discussed.

CODE B287   **£4.95**
Postage: UK £1.50, Europe £3.95, R.O.W. £5.50

MIDI SURVIVAL GUIDE

by Vic Lennard
Whether you're a beginner or a seasoned pro, the 'MIDI Survival Guide' shows you the way. No maths, no MIDI theory - just practical advice on starting up, setting up and ending up with a working MIDI system. Contains over 40 cabling diagrams, and how to: connect synths, sound modules, sequencers, drum machines and multitracks; how to budget and buy secondhand; using switch, thru and merger boxes; transfer songs between different sequencers, get the best out of general MIDI , and understand MIDI implementation charts.

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by RA Penfold
Want a MIDI THRU box, patchbay or switcher? Well they're all here. And you don't need a degree in electronics either. All the projects are explained in detail, with full instructions on assembly. So if your into MIDI and you want to expand your system without taking out a second mortgage, fear not. Here's the book to help you build up your MIDI system without laying out thousands on hardware.

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THE ARC MUSICIANS' DIRECTORY

The new Musicians' Directory from Arc Publishing aims to provide all things to all musicians: whatever your style of music, the comprehensive listings offer you the contacts you need, whether it's labels, studios, venues, music shops or management - and that just scratches the surface of the dozens of topics covered by the book. Apart from being a directory proper, the Handbook also includes a selection of useful articles, including subjects such as how to be a session player (by SOS's very own Paul White), music publishing, releasing your own record, copyright protection, accounting, legal advice and more. The Musicians' Directory offers over 380 information-packed pages for little more the price of a new CD.

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SYNTHESIZERS

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by Julian Colbeck
The latest instalment in the intrepid Keyfax series offers potted specifications and concise mini-overviews of digital pianos, home keyboards, General MIDI modules, stage organs and computer sound cards. Look out for company backgrounders, contact details and cross-references to earlier Keyfaxes.
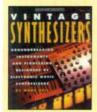
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Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

SOS Book Shop

VINTAGE SYNTHESIZERS

By Mark Vail
This well-illustrated, 300 page book covers synth history, interviews with designers and overviews of important instruments. Mark Vail's book could be the most entertaining and useful synth book yet — check out the definitive history of the Minimoog, complete with pre-production designers' sketches. While not strictly a buyers' guide, there is a comprehensive section to sourcing, valuing, upgrading and servicing classic instruments.

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PART ONE: A-M / PART TWO: N-Z

The A-Z of Analogue Synthesisers Part One: A-M
Peter Forrest

The A-Z of Analogue Synthesisers Part Two: N-Z
Peter Forrest

by Peter Forrest
Complete rundown of all the major analogue synths and keyboards ever made, spread across two books. Each is a testament to the massive amount of research and effort put in by the author. Featuring pocket company histories and detailed data on the instruments produced, each book provides a comprehensive overview of the qualities of various instruments; charts and tables assess second hand values and maintenance levels necessary to keep a given instrument playable as well as such intangibles as sound quality, collectability and user interface. Includes colour photos of many classic instruments.

PART ONE: A-M CODE B294   **£14.00**
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PART TWO: N-Z CODE B338   **£16.00**
Postage: UK £1.95 Europe £5.50 R.O.W. £8.50

KEYFAX 2

by Julian Colbeck
1989 version of Keyfax provides individual summaries and specifications of the last of the great mono synths, digital pianos, and classic polysynths like the Roland JX10 and Prophet VS — forerunner of the SY22 and Wave Station. Early Keyboard and rack-mount samplers are covered in this indispensable guide. Still a great buy.

CODE B096   ONLY **£5.99**
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

THE MUSEUM OF SYNTHESIZER TECHNOLOGY

by Martin J Newcomb
If you liked our feature on the opening of the Museum of Synthesizer Technology in October, but haven't got the time or the cash to visit in person, then the next best thing has to be the museum's guide book. This 118 book is printed on glossy paper and contains full-colour pictures of a large selection of exhibits from the museum, together with some descriptive text and company backgrounders. The text reads a little like a fanzine, but the hardcore synth fanatic will want this book for the pictures. In these pages you will glimpse instruments that you are unlikely ever to experience in the flesh: an exceedingly large Roland System 100 modular set-up, an EMS Synthi 100, an ARP 2500, a large Emu modular and what must be the comprehensive collection of Moog equipment anywhere.

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Postage: UK £2.50, Europe £6.95, R.O.W. £9.50

DRUM MACHINES

DRUM MACHINE RHYTHM DICTIONARY

By Sandy Feldstein. For use with Roland drum machines or any grid-based pattern system. First 75 pages on programming huge range of rhythms in rock, latin, jazz and funk styles. Remainder analyses styles and patterns of world's top drummers - Phil Collins, Billy Cobham, Steve Gadd, Stewart Copeland, etc. Highly recommended.

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Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

RHYTHMICAL GROOVES & PATTERNS

By Siegfried Hoffman. Looks at how drummers compose rhythm patterns to add emotion, swing or groove. Contains examples for you to programme into your drum machine or sequencer.

CODE B115   **£11.50**
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

260 DRUM MACHINE PATTERNS

By Rene-Pierre Bardet. Even more drum pattern styles (paso doble, charleston, etc)

CODE B019   **£7.95**
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

DRUM MACHINE PATTERNS

By Rene-Pierre Bardet. 200 drum patterns and breaks presented in one-measure grid notation. Funk, R'n'B, ballad, pop, reggae, afro-cuban and many other styles.

CODE B018   **£7.95**
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

PLAYING TECHNIQUES

SOLID GROOVES

By Dieter Petereit & Herb Quick
128 pages dealing with both bass and drums, the 'heart' of the pop group, together. Although written primarily for drummers and bass players, anyone interested in understanding rhythmical music in popular styles will find this book invaluable.

CODE B172   **£11.50**
Postage: UK £2.50, Europe £4.95, R.O.W. £7.50

CLASSICS IN SEQUENCE

by William Lloyd & Paul Terry
Takes concepts behind Music In Sequence and applies them to all-time favourite classical music scores. Authors show how to make fresh, exciting interpretations of classic scores. Info on reverb and effects, interpreting scores, editing synth voices. Highly creative—an ideal workbook for the music classroom. Covers Medieval, Renaissance dance music, Bach's Toccata in D minor; Vivaldi, Purcell, Handel; opera excerpts from Rossini, Verdi, Borodin; Mozart, Schubert, Tchaikovsky, music from Carmina Burana; Debussy, Satie, Steve Reich's Piano Phase and more. Highly recommended.

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Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

MUSIC IN SEQUENCE

by William Lloyd & Paul Terry
Still one of our best-selling books. Easy to follow, practical guide to making real use of your sequencer, written by people who really understand music and how to create it using today's technology. This brilliant, unique book carries the SOS seal of approval.

CODE B155   **£12.95**
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

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sounding Off

Following Jean-Philippe Rykiel's comments in last month's *SOS*, it's interesting to hear from another visually-impaired musician. IAN POPPERWELL invites you to take sides in the high-tech exclusion game...

As a blind musician, playing in a gigging band and with an 8-track home studio, I want to raise the issue of disabled people's access to music and recording equipment. A charity assisting disabled people with physical impairments to gain some access to music technology, the Drake Music Project, was featured in *SOS* last April, but I think that they painted too rosy a picture — here's another side of the story.

It's well documented and discussed in *SOS* that much of today's music technology packs more and more facilities into smaller and smaller spaces. This can be advantageous in terms of quantity of features and price, but there is a down side. Paul White has put forward the 'increased features/decreased creativity' correlation, but for me — and for many other disabled musicians — it's accessing those features at all that is the barrier. LCD screens (sometimes with touch-sensitive areas), increment/decrement parameter control, Alpha/jog/shuttle dials...

These barriers have become starkly evident to me recently, as I've been getting back into equipment-buying after a few years' break. Apart from purely analogue or extremely simple digital items, it's really difficult to find something which has the features that I want, and which I can use independently on stage or for recording, that is even vaguely accessible to me. For instance, take a multi-effects processor: I'd like a unit with high-quality effects, that's programmable (by me), but I don't want to need to see the display screen merely to call up a program. Drum machines are another example. When I had an old TR606 with a little LED above every step button, using it was dead easy; now I've got a 'Rhythm Composer' which has an LCD screen (without any back light) and numerous pages to contend with — I don't know *anybody* who finds it easy or intuitive to use. And then there are synths, workstations, samplers, DAT machines, sound modules, sequencers, hard disk recorders...

On old analogue synths, for example, I could just feel a knob or switch and know exactly what it was set to and what that setting would mean in terms of the whole sound — and other musicians, too, tend to like tangible and intuitive controls rather than virtual ones. I notice that, in reviews, pieces of equipment with knobs and switches generally get praised for having 'a user-friendliness that's lacking in the competition'. Where blind people are isolated, though, is in sheer lack of choice — we aren't able to go for the cheaper option if it isn't usable independently by us. Don't get me wrong — I'm interested in technology and I follow its development; I've read *SOS* since it started (coveting many review items), and am excited by 'progress'. My gripes relate to the lack of access to that technology for me and for other disabled musicians and engineers. Generally, I'm forced to make compromises in terms of features, sound quality, or build quality in order to get equipment that's accessible enough fo me to use independently. And if I then want to do anything but the most basic operations with MIDI, I have to get somebody else in to at least set it up for me.

Interestingly, computers have — until recently — been of little help in terms of music. For word-processing and other text-based applications, and a few sequencing packages, PCs can be used easily and efficiently with a speech synthesizer and associated screen-reading software, and this has provided immense access to information, although there's currently very little available to enable a Windows interface to be accessed reliably and in detail with a speech synthesizer. This is changing, but developments for disabled users are lagging well behind the mainstream market, so that disabled users are often forced to make compromises in terms of how much of a particular application they can access.

There are plenty of disabled musicians around, and my view is that we need to be making manufacturers and suppliers of equipment aware of the exclusivity of many of their products, rather than sitting back and complaining, or merely trying to fit in and manage. Let's speak with one voice, and make it heard!

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, Cambridge CB3 8SQ. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.