

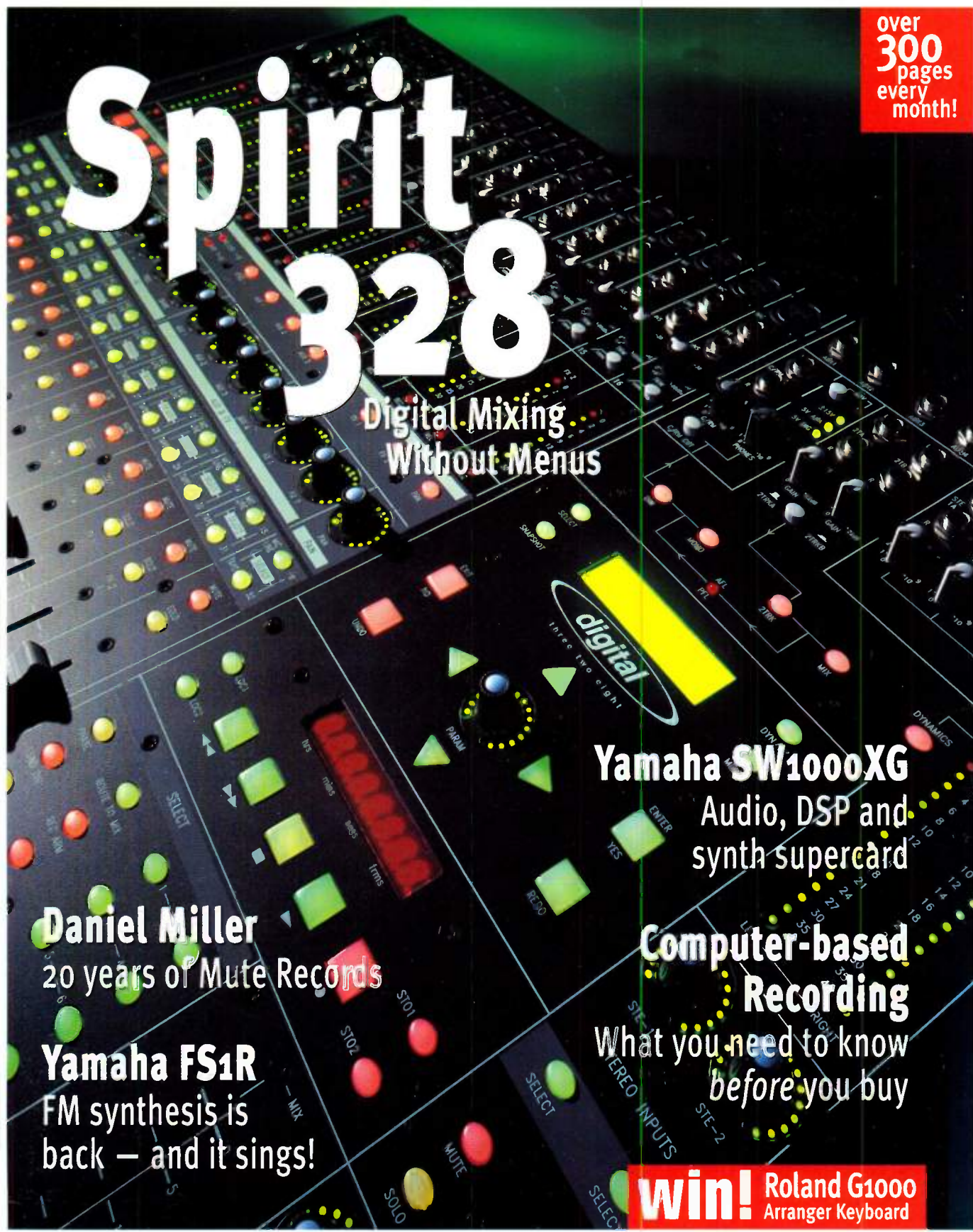
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As computers become an ever more important part of recording and mixing, the number of complex processes that we can inflict on our audio seems to be increasing exponentially. In addition to the usual delay/reverb effects, compressors, gates and equalisers, we now have the power to retune vocals, to impose the character of one singer on another, to 'convolve' two different audio signals to produce a brand new one, or even to convert scanned graphics into tonal pictures. Software mixers come with multi-band parametric EQ, dynamics on every channel, and built-in effect libraries — but with every increase in power comes the challenge of learning how to control it.

The traditional way of driving a computer is to use a mouse and keyboard, and to be fair, a number of people manage perfectly well manipulating music in this way, but it doesn't suit everybody and it only permits the adjustment of one parameter at a time. Of course purists will say that you can't beat the old system where you have one knob for each function — no menus, no multi-function buttons, no shift keys, just dedicated knobs and switches. They're right in many ways, but the problem is that if you were to provide a conventional control panel for something like Yamaha's DSP Factory, you'd end up with a panel about the size of a double bed and it would be ridiculously expensive. Similarly, try to do the same with a MIDI + Audio sequencer that also runs plug-ins and you'll find that you have to modify the interface every time you add a new plug-in. So what's the answer?

The only sensible approach at the moment seems to be to combine the best of old and new technologies, and you can judge how well (or otherwise) this works by looking at the better designed digital mixing consoles. Here you have

physical faders for adjusting channel levels, but these can also be switched to adjust things like aux send or buss levels, and instead of having a set of EQ knobs for each channel, you have just one channel's worth of dedicated EQ knobs

to be used in conjunction with channel select buttons. Some say dedicated controls are still easier to use, but that depends on how big the console is. In a big analogue studio, you might have to slide your chair to the other end of the console just to find the EQ you want to adjust, whereas with the more compact digital consoles, you can at least get to everything without moving too far.

A number of products have sprung up that purport to make it easier to control software, and these range from inexpensive MIDI fader boxes to elaborate control surfaces that are every bit as sophisticated as the digital consoles they emulate. You'll find some of them in this issue, but one potential problem is that the more sophisticated the interface, the more dedicated it is, so if you want to move to a different platform or recording system, the interface ceases to be useful. It's quickly getting to the point where a sophisticated hardware interface costs more than the software it's designed to control. No doubt the future will see further attempts at building a more universal interface, but for such a system to have any chance of success, it will require a degree of cooperation between manufacturers so that everyone adheres to certain basic standards and protocols. It may also lead to the exploration of new areas in control such as wall-sized projection displays, VR visors or touch screens.

In fact, there's a good case for a studio system with no controls at all, other than a voice or text input device where the operator acts as the producer and the software functions as the virtual sound engineer, complete with the ability to adapt to your working methods and sonic preferences. When you tell it to record a guitar track, it tells you where to plug the mic, it sets the levels and it decides which track to record it on. A producer doesn't need to know these details, so let the software sort it out. If you want to compress the guitar, you just ask it — it decides how to patch in the compressor and it sets the initial parameters. If you don't like what it's chosen for you, you ask it to change it. It might sound far-fetched at the moment, but it's my guess this type of technology will be more fact than fiction within the next five or 10 years' time.

Paul White *Editor*



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• SBL-11	5-2000	7.0	35	30	+7	18.75
SBL-11H	2-500	5.8	68	45	+10	5.65
SBL-1-1LH	0.2-400	5.2	64	52	+10	8.20
• SBL-1XLH	10-1000	6.0	40	55	+10	7.25
SBL-2LH	5-1000	5.9	61	54	+10	8.20
SBL-3LH	0.07-250	4.9	60	53	+10	8.2C
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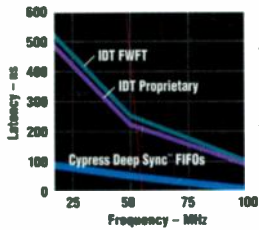
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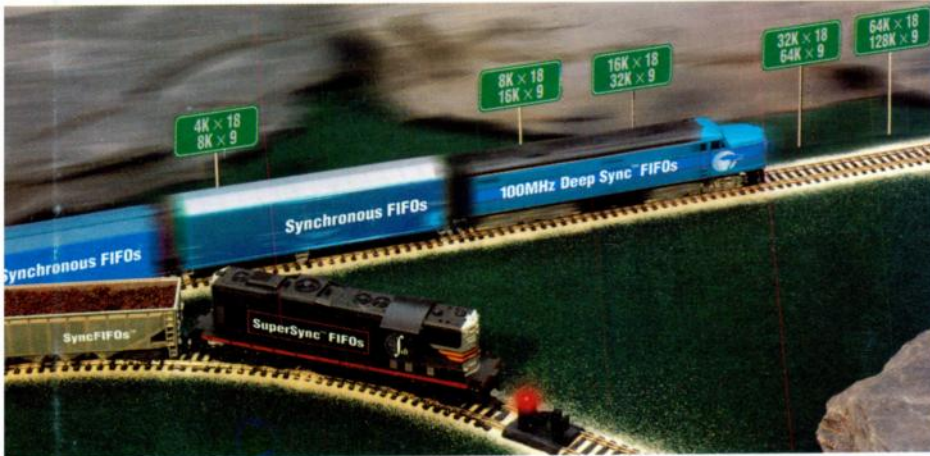
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Frequency Select Pin		
FS Select pin	Clocks can be async	Does not limit range of operation
Depth Expansion		
Serial cascade	Token passing	Low latency and low power
Power (f=20MHz)		
x18: -180mA	-100mA	Lower power
x9: -150mA	-50mA	Lower power
>9 Package		
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reviews

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technique

20 Tips: Using Microphones **34**

If your music involves acoustic instruments or voices, the ultimate quality of your recordings depends entirely on your microphones and what you do with them — put them in the wrong place and you might as well be using cocoa tins and string. We provide some top tips.

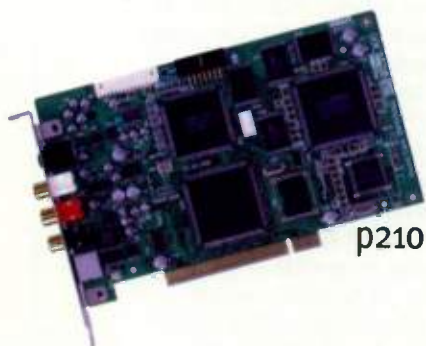
Creative Sampling: Part 1 **64**

These days, samplers are the electronic musician's bread and butter — but they need not be used in commonplace ways. The first part of a short series looks at ways to spice up your tracks with samples from unusual sources.

Reverse Reverb The Digital Way **154**

Reverse reverb is a distinctive effect that can really make your track stand out, but while it's easy to create using an open-reel analogue recorder, the process is less obvious with digital audio recording systems. Nevertheless, it can be done...

win Roland G1000 Arranger Keyboard **p272**



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features

Daniel Miller: His Home Studio & Mute Records **46**

Boss of the highly successful and determinedly independent Mute Records, Daniel Miller is one of the UK music industry's unsung stars. We celebrate 20 years of Mute with the man himself — and take a rare tour of Miller's superb home studio.

50 Christmas Buys For Musicians **78**

There are loads of handy gadgets out there, every one of them more desirable than socks or aftershave. Take a look at our selection of stocking fillers for musicians.

Tracks: Steve Levine ■ Producing The Honeyz **88**

The doyen of digital, producer Steve Levine, talks about how he put together the recent Top Ten R&B hit for the Honeyz, 'Finally Found', in his home studio.

PC Musician: Optimising PC Hard Drives For Audio **94**

You may have the fastest SCSI drive in the world, but this doesn't automatically ensure a blistering MIDI + Audio performance. We look at the best ways to set up your hard drive for digital audio recording.

Moving To Computer-Based Audio Recording: Part 1 **136**

In the first part of a new series which aims to help you make a painless transition to computer-based digital audio recording, we explain the importance of making the right decisions *before* you buy a new system.

Craig Leon: Recording Blondie's New Album **158**

More than 15 years after the release of their last album, *The Hunter*, four of the original members of Blondie are about to make a comeback with a brand new album. Long-time friend and producer Craig Leon describes how this latest offering was recorded.

John O'Connor: Composing For *King Of The Hill* **202**

John O'Connor said farewell to the UK music business with the million-selling single 'Star Trekkin'. Now living in the USA, he's one of the principal composers for the cartoon series *King Of The Hill*, as well as a successful recording artist in his own right.

Retrozone: Korg DW8000 Synth **258**

Back in 1985, a synth was nothing if it was not digital, and Korg's DW8000 was billed as "more than digital". For this reason it has been widely neglected in the current analogue revival, although it has much to recommend it — including a substantial amount of analogue circuitry!

regulars

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● modular in miniature

Nord Micro synth retains essentials of Clavia approach

Clavia's Nord Modular software/hardware combination synth has now become the flagship of a range of two, with the introduction of the compact Nord Micro Modular. Although coming in at a much lower price point (£449), the Micro is 100% patch-compatible with the Nord Modular patch library. It offers up to four voices, depending on patch complexity, and is equipped with two analogue inputs (for processing external audio with modules such as the 16-band vocoder),

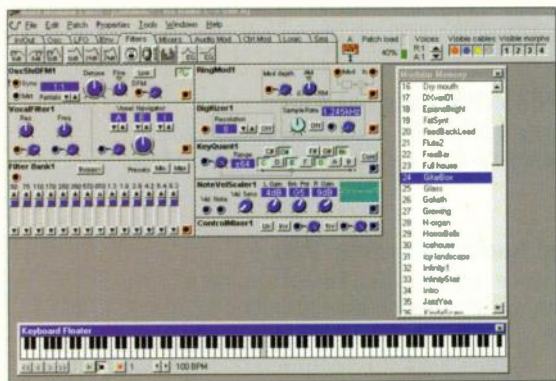
two outputs, a headphone socket, MIDI connections, and direct PC connections. In the same way as its big brother, the Nord Micro Modular is edited via PC-only editing software. Important parameters can be assigned to the three front-panel knobs, and if it's played from a MIDI keyboard it's possible to assign more Micro parameters to MIDI controller numbers. The Nord Micro Modular also includes a new, specially designed drum-synth module, which offers analogue drum sounds that can be programmed with "typical analogue step sequencers". There's space for 100 patches on board, and more are available from the Clavia web site.

The Nord editing software is now at v2.1 and is downloadable free from the Clavia web site. It introduces a number of new modules and improved editing functions. For example:

- The Oscillator group has an extra sine-wave oscillator, with sync and FM modulation inputs for creating classic FM-type sounds.



- The Filter group now has a formant filter designed to simulate the vocal tract.
- There's a new Filter Bank, which is a 14-band static filter with attenuation controls for all bands.
- The Audio Mod group has been augmented with a Digitiser module that continuously samples an incoming signal at a selectable sample rate and bit resolution (take a clean input and transform it down to a dirty 8-bit, 5kHz signal), and a Ring Modulator.
- The Ctrl Mod group now features a Key Quantiser, which quantises the values of a continuous control signal and generates note values according to a user-defined key scale, a Control Signal Mixer, with polarity invert, and a note and velocity scaler for control signals, which can produce control signals based on input note and velocity values.



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moving spirit

328 digital desk tours Britain



Spirit's Digital 328 mixing console (reviewed on page 168 of this very issue) is going on a UK tour throughout November and December. There will be in-depth demos from experts, informal question and answer sessions and "the occasional star guest dropping in", at the following venues: November 13th: Sound Control, Manchester (0161 877 6262); November 14th: Academy of Sound, Sheffield (0114 264 0000); November 16th: Andertons Music, Guildford (01483 456777); November 17th: Sound Control, Bristol (0117 934 9955); November 19th: Turnkey, London (0171 240 4036); November 21st: Academy of Sound, Leeds (0113 240 5077); November 22nd: Academy of Sound, Stoke (01782 205100); November 24th: Music Lab, London (0171 388 5392); November 25th: Academy of Sound, Norwich (01603 666891); November 26th: PMT, Oxford (01865 248083); November 27th, 28th & 29th: National Music Show, London, Wembley; December 1st: Sound Control, Newcastle (0191 232 4175); December 2nd: Sound Control, Glasgow (0141 204 0322); December 3rd: Dawsons, Warrington (01925 632591); December 7th: Digital Village, Barnet (0181 440 3440); December 8th: Digital Village, Croydon (0181 407 8444); December 9th: Digital Village, Cambridge (01223 316091); December 10th: Music Village, Romford (0181 598 9506); December 12th: Musical Exchanges, Birmingham (0121 248 5860).

If you'd like to attend one of these events (dates correct at time of release), give your nearest venue a call.

T Spirit +44 (0)1707 665000.
F +44 (0)1707 665461.

much more than MIDI

Midiman release new tools for the modern musician

Midiman's range of digital audio tools continues to grow, with the addition of the SAM ADAT-S/PDIF and S/PDIF-ADAT converter box. Priced at just £329, SAM lets you easily convert ADAT-format digital audio to S/PDIF and vice versa. What makes SAM especially interesting is that during ADAT to S/PDIF transfers, each of the ADAT's eight channels can be mixed down to stereo — with independent pan and gain controls — using the onboard digital mixer. In addition, ADAT audio can be transferred in odd/even pairs directly to the S/PDIF output, and incoming S/PDIF audio can be assigned to ADAT channels. Any sample rate between 39kHz and 51kHz is supported, and when the mixing controls are not in use lossless 24-bit transfers are possible.

The new Mac driver for Midiman's Dman 2044 PCI multi-channel audio card is now available. This offers ASIO (for use with Steinberg Cubase VST or compatible software) and Sound Manager support, although only two of the card's four inputs can be used at once (all four outputs remain active, however). Audio connections are via the included breakout cable, or an optional desktop breakout box (£45). A package including the Dman 2044 and the breakout box is on offer at £279, giving a saving of £15 on the separate prices.

Midiman are also shipping the new Dman PCI full-duplex stereo audio card for PCs. This £99 card is equipped with gold-plated RCA analogue audio connectors, MIDI interface, on-board wavetable synth, daughterboard socket and CD-ROM connector. It's fully Windows 95/98 Plug and Play compatible, and requires one IRQ and no DMA channels. The card has 18-bit delta-sigma converters, a 16-bit signal path, a dynamic range quoted as 90dB, and frequency response of 20Hz-20kHz.

Last up in this Midiman news bulletin is the BiPort 2x4s (£129), a Mac/PC compatible 2-in/4-out MIDI interface and sync box, offering 64 independent MIDI output channels. The unit will also function as a stand-alone SMPTE and MIDI Time Code reader/writer/regenerator; its front panel allows full SMPTE control even without a computer. A Mac Thru Switch allows you to activate or bypass the unit, so that you can leave your modem or printer connected.

T +44 (0)1205 290680.
F +44 (0)1205 290617.
E midmanuk@compuserve.com
W www.midiman.net/

● a dream of a synth?

TD's Klaus Schulze in London launch of Quasimidi Polymorph

Fans of German synth legend Klaus Schulze and/or super-hip German synth manufacturers Quasimidi will want to be in the vicinity of Turnkey's London HQ on December 2nd, as that's the day when Klaus launches the long-awaited Quasimidi Polymorph synth. The event starts at 7pm with Klaus' live demonstration, and he'll even be available afterwards to answer questions from the audience. Entrance is free, but you'll need a ticket from Turnkey to get in, as places are strictly limited — so call early if you want to attend.

The Polymorph's price has been set at £699, for which it offers four independent synths created with Quasimidi's own modelling synthesis. Each synth has its own effects processing and individual output and, as you'd expect, the instrument is plentifully supplied with knobs and buttons for instant access to virtually all parameters. A built-in analogue-style step sequencer with comprehensive facilities completes the package.

Still on the Quasimidi front, we've heard that there have been some price cuts to the Rave-O-Lution 309 optional expansion range. The 309 now includes the 2-input/2-output audio expansion at the all-in price of £499, and can also be bought fully loaded with the Drum and Synth expansions for £569. That's a pretty good deal, given that these two expansions alone would have set you back £200 when they were first launched.



T Turnkey
+44 (0)171 419 9999.
F +44 (0)171 379 0093.
E sales@turnkey.demon.co.uk

B.Box a groover...

New budget PC drum machine from Steinberg

Steinberg's new £59.95 B.Box is a "groove sampler in software". With a user interface similar to that of a drum machine, B.Box allows you to sequence your own samples in step time, or access the supplied library of classic drum machine samples — examples are provided from the Roland CR78, R8, TR707, TR808, TR909, Emu SPI2, Linn 9000, Simmons SDS5, and more. The software offers eight

simultaneous channels (sounds), a swing parameter, and a distortion effect for each channel. Patterns can be up to 16 bars long, and songs are created by chaining patterns together.

T Arbiter Music Technology
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E sales@arbitergroup.com
W www.arbitergroup.com

● C1, buy one?

TL's Valve Classics series kicks off with compressor



TL Audio used the recent AES Convention in San Francisco to launch the first in their new Valve Classics series, the C1 stereo valve compressor.

The new C1 features several improvements over the original best-selling model it replaces, including gold-plated ceramic valve bases, high-grade US military specification General Electric valves and circular, backlit VU meters. It can operate in dual mono or stereo linked mode, and provides fully variable control over input gain, threshold, ratio, attack, release and gain make-up. Mic, line and instrument inputs are provided, and both balanced XLR and unbalanced jack connections are available.

TL Audio's new valve 8-buss mixing desk will be shown for the first time in the UK at Digital Village's new West London store (14 The Broadway, Gunnersbury Lane, Acton, London W3 8HR) on November 27th, between noon and 8pm. The Valve Technology console, or VTC, has up to 120 EQ-able inputs, six auxiliary sends and 4-band EQ with fully parametric mids. The West London store will be the exclusive London showroom for the VTC; refreshments will be available on the day.

T TL Audio +44 (0)1462 490600.
F +44 (0)1462 490700.
T Digital Village +44 (0)181 440 3440.
E info@tlaudio.co.uk
W www.tlaudio.co.uk

perfect pitch for your PC

AutoTune plug-in crosses platforms

The Antares *AutoTune* real-time pitch-correction plug-in is now available in a DirectX version for PCs, following customer demand for a PC version. Like the existing Macintosh version (reviewed *SOS* August 1997), *AutoTune* offers two modes of operation: Automatic Mode uses advanced DSP algorithms to detect the pitch of incoming monophonic audio in real time, and correct it to the pitch desired by the user, while Graphical Mode displays a graphic representation of a phrase's pitch contour and provides a selection of graphic tools that allow the user to modify the pitch in almost any way they like. *AutoTune* for PC costs £269 including VAT.

The acclaimed *AutoTune* method is also available in award-winning hardware form, as the ATR1 rackmount pitch-corrector (reviewed *SOS* October 1998), at £999.

T Unity Audio
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F +44 (0)1440 785845.
E sales@unityaudio.co.uk
W www.unityaudio.co.uk



millennium gear up for the future

Nottingham store upgrades premises

Major refurbishments have been taking place at Millennium Music Software's Nottingham store. The company, which specialises in PC-based digital recording systems, aims to have its entire range of PC audio recording systems on demo so that customers can see them in action side by side. The Mackie D8b (as featured on *SOS*'s November cover) will be up and running, linked via its ADAT light-pipe interface to one of Millennium's high-end music PC systems. Tascam's more affordable TMD1000 digital desk will also be on demo, along with a wide range of audio recording products, soundcards and software, plus Millennium's large selection of studio microphones.

Millennium were recently appointed Midlands agent for the Sibelius score-writing system for PC/Mac. (This acclaimed scorewriter was previously available only for the Acorn Archimedes.) A Sibelius demo has been arranged by Millennium for Saturday 21st November, 2-5pm, at the Nottingham Playhouse, where those wanting a serious look at the system will be able to see it running and obtain advice from senior representatives of both Sibelius and Millennium. And while we're talking demos, Tuesday December 15th is Millennium's computer audio day, when new products from Digidesign, Steinberg, Soundscape, Cakewalk and Emagic will be spotlighted from noon. Call Millennium for further details.

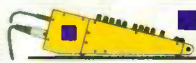
T +44 (0)115 955 2200.
F +44 (0)115 952 0876.
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CR1604-VLZ

First read the mixer ads. Then listen to the mixers. You'll discover why our original CR1604-VLZ® is the overwhelming choice of audio professionals.

■ **Ultra-wide 60dB gain range** for both microphone and line inputs handles everything from close-miked kickdrums and ultra-hot digital multitrack inputs to the most timid vocalist or delicate wind instrument.

■ **To test mix amp headroom**, load every channel of a mixer with HOT inputs. If you hear distortion, the mix amplifier is overloading. The CR1604-VLZ uses a special negative gain mix amp architecture to add 6dB more headroom than the competition.



■ **Smoother, more accurate**

fades. The CR1604-VLZ's true logarithmic taper potentiometers give you precise control throughout the fader's travel — instead of giving out about 3/4 of the way down. Try it at your Mackie Dealer and you'll hear what we mean.



■ **One mixer. Five physical configurations** to fit your space and applications.

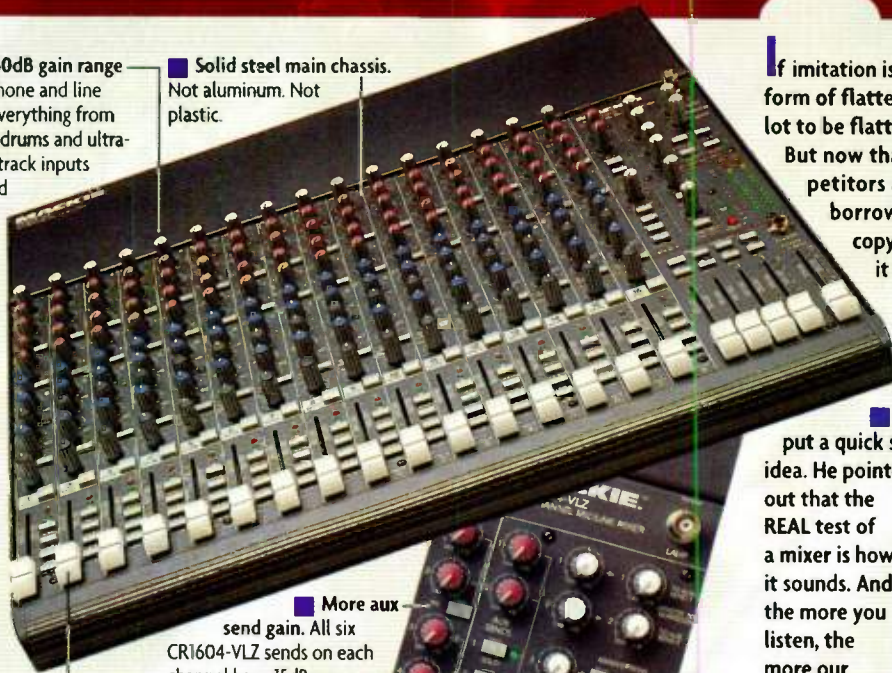
Only the CR1604-VLZ can be switched in minutes



from a table top or rack-mount mixer with input/output jacks on the top (1 & 2) to a space-conserving 8-rack space mixer with jacks to back (3) — rack rails are included. Add our optional RotoPod-VLZ bracket and rotate the input/output pod to the same plane as the mixer's controls (5 & 6) for patching-intensive applications.

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■ **Solid steel main chassis.** Not aluminum. Not plastic.



■ **More aux send gain.** All six CR1604-VLZ sends on each channel have 15dB more gain after Unity. This lets you boost weak effects or create a "super-wet" sound.

■ **Musical, natural EQ with sweepable midrange.** Others have copied our frequency points, but nobody can equal our sound.

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■ **Hypersensitive Signal Present LED** on every channel.

■ **Very Low Impedance (VLZ) circuitry** uses high current and low resistor values to dramatically reduce thermal noise and crosstalk. A Mackie Design exclusive with very audible benefits.

■ **Feature for feature,** the most versatile, flexible, CREATIVE master section of any compact mixer.

■ **The definitive, big-console-quality mic preamps** with all discrete (no hybrid) circuitry, astonishing headroom and a real, verifiable E.I.N. (noise) spec of -129.5 dBm. When you compare mixers, bring a familiar condenser microphone and prove to yourself just how much better our mic preamps sound.

If imitation is the sincerest form of flattery, we have a lot to be flattered about.

But now that some competitors are even borrowing our ad copy, we figured it was time to come up with a devastatingly nasty come-back.

■ **Greg Mackie**

put a quick stop to that idea. He pointed out that the REAL test of a mixer is how it sounds. And the more you listen, the more our CR1604-VLZ's low noise, high headroom, pristine mic preamps & natural EQ put it ahead of the pack.

■ **Sound quality, Greg pointed out, is why the CR1604-VLZ has a longer roster of famous users than any other 16-channel compact mixer... major groups & artists, Emmy-winning TV composers, Academy Award-**

winning sound engineers, network news & sports departments. So why dis the competition?

■ **Call your Mackie distributor for complete info and that long list of famous users. Then make your final mixer buying decision with your ears. Anyone can write an ad. Only Greg can make a mixer as good as the CR1604-VLZ.**



Musician Magazine thinks the original is clearly the best.

Below: a few of the 300+ folks (and one incontinent Chihuahua) who work at Mackie Designs in Woodinville, WA 20 miles north of Seattle.

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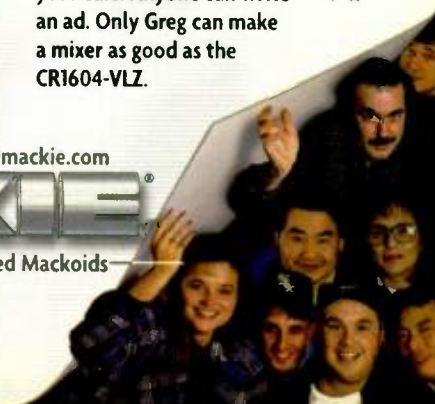
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Tel: 01245 344001 Fax: 01245 344002 email: info@keyaudio.co.uk Web: www.keyaudio.co.uk/keyaudio

World Radio History



bullets

Kenton tweak the Freak

Kenton's Control Freak 8-slider MIDI hardware controller, reviewed in *SOS* November 1998, now features extensive support for Yamaha's new SW1000XG card. Kenton have also addressed *SOS*'s review comments about the Control Freak in last month's issue, and improved the editing procedure so that it's possible to save both name and data edits in one operation, rather than two.

T Kenton Electronics
+44 (0)181 337 0333.

Comtracks exceed 10,000 song titles

Comtracks UK have announced that their *Autoscore* pitch-to-MIDI conversion program is now available as a VST-format plug-in. The *Deluxe* version costs £79.95, while the *Pro* version costs £154.75. Comtracks also tell us that their backing track library (available in MIDI, MC50/500, MiniDisk or audio format) now contains in excess of 10,000 titles.

T +44 (0)131 468 1150.



battle of the boxes!

MC303 owners can compete in European music contest

If you're the owner of a Roland MC303 Groovebox, you could be in with a chance of winning an MC505 Groovebox and an SP808 Groove Sampler, plus a place for your music on a European Groovebox album being compiled by Roland. Read on...

Roland are holding their first European Groovebox contest and are looking for original tracks performed on the MC303. If you want to enter, you should send one track, on cassette, DAT or CD, to Roland, after first asking for a special Groovebox entry leaflet. The top 10 UK entrants, judged by Roland, will be invited to perform their tracks live at London club The End on 16th February, 1999. The winner of this heat becomes UK Groove Champion and walks away with the prizes listed above.

The special Groovebox entry leaflet, which you'll need to enter the contest, also acts as a free entry ticket to the Grand Final, even if you don't enter the competition, and Roland will also be taking the opportunity of the final to show new dance-related gear for '99. Call Roland Customer Care for your leaflet or more information.

T Roland Customer Care
+44 (0)1792 515020.

W www.roland.co.uk

SOS on the net
www.sospubs.co.uk

● fuel sell!

Yamaha launch A3000 *Fuel* sample CD-ROMs

Fresh from Japan comes news of six sample CD-ROMs for Yamaha's A3000 sampler. The so-called *Fuel* series offers "ready-to-use, licence-free libraries of grooves and loops" in a variety of styles, from ethnic sounds to dance grooves and ambient effects. All collections include an A3000 native-format CD-ROM and audio CD, and cost £79 each from Yamaha Hi-Tech dealers.

- *Fuel 1: Signals* offers synth loops, arpeggiator sequences and filtered and unfiltered phrases from a wide range of classic synths.
- *Fuel 2: Funky Xtreams* is a collection of "hardcore techno beats and machine beat loops with various styles ranging from techno and drum & bass to hip-hop and reggae".
- *Fuel 3: Ethnicity* provides loops featuring exotic world percussion sounds, including gamelan, 38 different types of gongs and didgeridoo samples.
- *Fuel 4: Twisted Reality* offers "special effects full of ambience", produced using effects processing, synthesis and wave editing.
- *Fuel 5: Opium* is a collection of traditional Chinese instruments, played by established Chinese musicians, with roots stemming from the Central Chinese Traditional Orchestra Group.
- *Fuel 6: Vintage* is a compilation of classic synth sounds and filter movements from a wide range of vintage synths.

T UK Brochure Line +44 (0)1908 369269.

F +44 (0)1908 368872.

W www.yamaha.co.uk

metropolis FREQue out

Studio engineer endorses new DACS ring modulator

Back in the August issue of *SOS*, we announced the launch of DACS' new range of rackmounting ring modulators, and followed up in the very next issue with a review of the CoOSCIL2 model. Now we hear that the top-of-the-range FREQue is out and already proving a hit. Matt Howe, Chief Engineer at Metropolis Studios, has recently taken delivery of one, which he's been using on the forthcoming album by Flight 16. Matt's impressed with the FREQue, specifically with "the range of results you can achieve; really subtle to really outrageous and everything in between."

In addition to two ring modulators and two oscillators, the FREQue offers internal frequency modulation, external CV control of frequency, and simultaneous up and down frequency-shifting. It retails for £599 including VAT.

T +44 (0)191 438 5585.

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W www.DACS-Audio.co.uk

328

digital

three two eight

ON THE ROAD

Digital Mixing Seminars at your local dealer.....

November	Dealer	Location	Tel. No.	Time
4th & 5th	SBES	NEC, B/ham (Stand Nos. 37/38)		
Fri 13th	Sound Control	Manchester	0161 877 6262	Daytime
Sat 14th	Academy of Sound	Sheffield	0114 2640000	10-5pm
Mon 16th	Andertons	Guildford	01483 456777	2-6pm
Tues 17th	Sound Control	Bristol	0117 934 9955	All day
Thurs 19th	Turnkey	London	0171 240 4036	5-8pm
Sat 21st	Academy of Sound	Leeds	0113 2405077	10-5pm
Sun 22nd	Academy of Sound	Stoke	01782 205100	10-4pm
Tues 24th	Music Lab	London	0171 388 5392	10-5pm
Weds 25th	Academy of Sound	Norwich	01603 666891	2-6pm
Thurs 26th	PMT	Oxford	01865 248083	5-8pm
27/28/29	National Music Show	Wembley (Stand No. 300)		

December	Dealer	Location	Tel. No.	Time
Tues 1st	Sound Control	Newcastle	0191 232 4175	4-8pm
Weds 2nd	Sound Control	Glasgow	0141 204 0322	Daytime
Thurs 3rd	Dawsons	Warrington	01925 632591	2-7pm
Mon 7th	Digital Village	Barnet	0181 440 3440	5-8pm
Tues 8th	Digital Village	Croydon	0181 407 8444	5-8pm
Weds 9th	Digital Village	Cambridge	01223 316091	5-8pm
Thurs 10th	Music Village	Romford	0181 598 9506	5-8pm
Sat 12th	Exchanges	Birmingham	0121 248 5860	1-5pm



SPIRIT

by Soundcraft

A Harman International Company

Spirit Digital 328 is now shipping.

To be one of the first people in the known universe to see the future of digital audio mixing (and to become the envy of all your friends), call any of the above numbers and reserve your place at the demonstration of your choice.



Enquiries: Anita Barrett on 01707 665000 www.spirit-by-soundcraft.co.uk

directory enquiries

New edition of digital recording reference book available

The latest edition of SYPHA's comprehensive *Tapeless Audio Directory* — the seventh — has just been released. Though designed to help professionals with their buying decisions, this guide contains such an exhaustive range of information that anyone wanting to keep an eye on the tapeless market would find it useful. Every existing pro random-access audio system is listed, and even systems which are no longer in production get a mention. From cart replacement systems for broadcast to multitrack recorder/editors, to full post-production editing with surround mixing, if it's digital and tapeless it's in here. The listings detail target markets, hardware and software specifications, operational features, interfacing with external devices, networking and file transfer, archiving and backup, future development plans, training and customer support, typical configurations and costs, and supplier details for the USA, Europe and the Far East. In addition, a comprehensive explanation of the terminology is provided, with useful tips for potential purchasers. Get your copy from SOS mail order for £19.95 plus postage!

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 (full selection of books and merchandise and secure credit card ordering)

● united they stand

Emu-Ensoniq cement new relationship with AES launches

There's a ton of news from the combined forces of Emu-Ensoniq this month, kicking off with the debut of the Proteus 2000 sound module at the recent AES convention in San Francisco. Thousands of musicians all over the world have bought into Emu's much-loved Proteus series of instruments, and with the 2000 Emu aim to up the ante on all fronts. For a start, it boasts 128 voices of polyphony, 32Mb of ROM sounds and room to add 96Mb more (in the form of four 32Mb slots), four front-panel real-time control knobs, and 6-pole digital filters. On top of this, there's 24-bit effects processing, six analogue outputs and an S/PDIF digital output for the benefit of the increasing numbers of musicians owning a digital studio. Completing the package is 32 MIDI channel capability on two separate MIDI connections, 32-part multitimbrality, and a new operating system feature called Multi-mode setups; these setups include preset numbers, volume and pan settings for all 32 MIDI channels, making it possible to completely reconfigure the Proteus 2000 quickly and easily.

Also shown for the first time at AES was a modular digital mixing system from Emu-Ensoniq. The Mantis is a 112-input system with configurable I/O, Mac & PC mixing software with dynamic automation and advanced surround mixing support, internal 32-bit processing with 24-bit conversion, and a dedicated control surface — though support is also provided for the Mackie HUI mix control panel. The system's components are:

- Mantis Mainframe, a 3U mixing engine with seven digital I/O expansion slots.
- Mantis Annex analogue expander.
- Mantis Console.
- Mantis Mix Mac/PC automation/remote control software.

Up to 112 separate digital inputs are offered by the Mantis system; input types supported are TDIF, ADAT, AES/EBU, S/PDIF and a new "low-cost" proprietary interconnect Emu format called Emu Digital Interface, or EDI. Analogue requirements

aren't neglected: line-level and mic inputs are also available. Each input on the Mantis mixing engine features 4-band EQ and dynamics processing plus no less than 12 aux sends, of which four are sent to an internal 32-bit effects processor. The included *MantisMix* automation software works alone or in conjunction with the Mantis control surface or the Mackie HUI. Emu's Mantis Project Manager, Mike Barnes, emphasises the sheer number of inputs offered by the system: "The modern studio has to accommodate a ton of gear, and the need for more inputs on mixing consoles has become critical for most engineers. Mantis allows more gear to be connected, and stay connected, allowing virtual patching of any signal."

The Ensoniq bit of Emu-Ensoniq hasn't been idle, either: two new members of the PARIS digital recording system family are on the way (see *SOS PARIS* review in the January 1998 issue). The PARIS Concept and PARIS Concept FX are entry-level systems providing an affordable way into the family. Both systems run on either Mac or PC and come with the same software as the larger PARIS systems.

PARIS Concept includes the EDS500 PCI card, the Interface 2 2-channel audio interface (with 20-bit 128x oversampling A-D and 20-bit D-A conversion, plus two pairs of quarter-inch jack connectors), and the PARIS software. The Concept FX includes the EDS1000 PCI card, the Interface 2 unit, and the PARIS software. Both systems also come with special versions of Steinberg's *Wavelab Lite* waveform editing software for PC and BIAS *Peak LE* waveform editing software for the Mac.

Features common to both systems include:

- Powerful, non-destructive editing with 99 levels of Undo.
- Context-sensitive cursor for easy trimming or

moving of audio objects without having to change tools all the time.

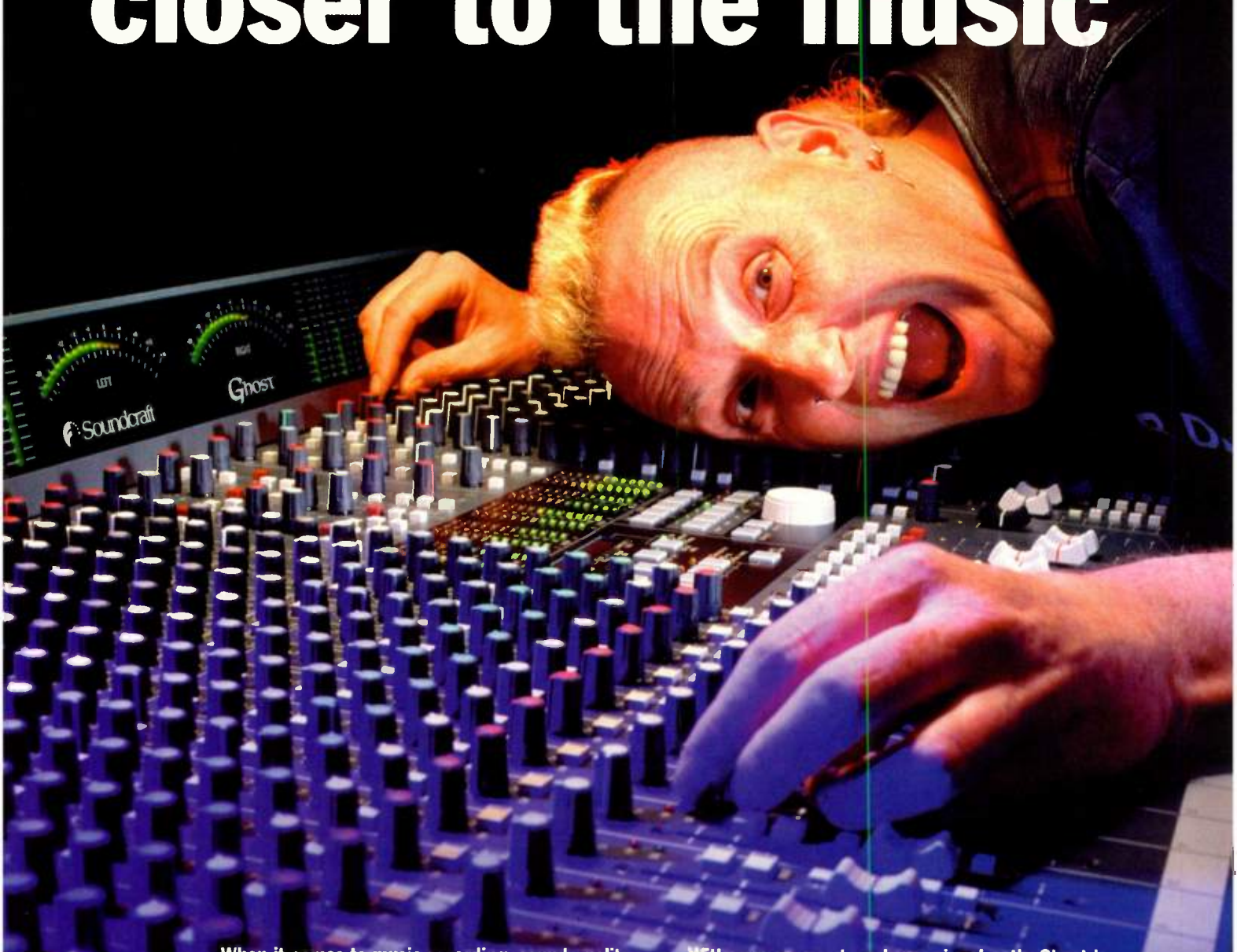
- A Free Form mode which supports 99 virtual tracks.
- Software mixing with 4-band real-time parametric EQ per mixer channel and a host of professional features, plus the ability to run DirectX and VST plug-ins.
- DSP functions such as gain change, normalise, sample-rate conversion, time compression/expansion and pitch-shifting.

PARIS Concept FX adds a wide range of real-time 24-bit effects, with a full selection of presets to start with. Both the new systems can be expanded into larger PARIS setups with the addition of extra PARIS hardware components.

T Emu-Ensoniq
 +44 (0)1753 630808.
F +44 (0)1753 652040.
W www.emu-ensoniq.com



Ghost gets you closer to the music



When it comes to music recording, sound quality is everything. So perhaps it's no surprise that most of the world's top studios insist on analogue technology when it comes to mixing consoles.

Now, thanks to Ghost, you can too.



With a pure, sweet analogue signal path, Ghost is a flexible, instant access, 8-bus console that's ready to work whenever you are. And despite its 'project studio' price tag, Ghost is packed with 'big studio' features like ultra-quiet mic preamps, classic 'British' EQ, external machine control and advanced mute automation.

So get closer to your music. Get close to a Ghost.

www.soundcraft.com

Ghost

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A Harman International Company

yamaha's new MO

Magneto-optical disks chosen for D24 digital recorder

With the majority of manufacturers of tapeless digital multitracks choosing hard disk or lomega removeable drives as recording media, it comes as a small surprise to see Yamaha choosing magneto-optical disks as the medium of choice for their new D24 digital 8-track recorder. Yet the choice is based on sound reasoning: Yamaha see MO disks as affordable and robust. A SCSI2 connector allows external hard drives to be connected, if desired, for alternate audio storage or increased recording time.

As it stands, the D24 offers 16-, 20- or 24-bit recording, at 44.1kHz or 48kHz, with a 96kHz option reducing track numbers. Fifteen minutes of 8-track recording is possible at 16-bit/44.1kHz, while nine minutes of 8-track is possible at 24-bit/48kHz, and nine minutes of 4-track recording at 24-bit/96kHz. All examples presume a 640Mb MO disk.

Each track also features eight additional virtual tracks, and a wide range of editing facilities is

provided. Audio data can be looped, copied, moved, erased, deleted and merged, with editing accuracy to a tenth of a frame. Tracks can also be pushed or delayed in relation to other tracks, and time compression/expansion is also possible, two tracks at a time. A wide range of sync options is available, to suit home studio or film and TV post-production alike — MIDI Time Code, bit-accurate SMPTE timecode, video sync and word clock. The D24 can be controlled via MIDI Machine Control and 9-pin protocols (RS422), or optional remote control unit. Up to eight D24 units can be sync'd together for 64-track operation.

The D24 is also compatible with the new MY8/MY4 series mini YGDAL interface cards, used in the 01V digital mixer; cards provide ADAT, T/DIF, AES-EBU and analogue I/O.

T UK Brochure Line +44 (0)1908 369269.
F +44 (0)1908 368872.
W www.yamaha.co.uk

FX Rentals copy that

Rental company offers audio transfers

A new service is being provided by pro audio rental specialists FX Rentals. The Copyroom will be able to undertake safety copying and transfers for virtually all audio formats — for example, 48 DASH, RADAR, Pro Tools, ADAT, DA88, CD-ROM, Mimidis, and all analogue formats. Copyroom facilities also include DAT streaming and short-run CD, cassette and DAT duplication. ISDN lines allow direct audio transfers to and from The Copyroom, and the service is available 24 hours a day.

T +44 (0)181 746 2121.

education corner

Studio In A Box

Music Technology Training courses from Studio In a Box include weekend workshops on *Cubase* From Scratch; Recording, Mixing and Mastering with Virtual Studio Technology; and Advanced Sequencing. For £115 (per course) the company offers two days tuition in a workshop environment with hands-on use of equipment, lunch on Saturday and Sunday, plus evening meal on Saturday. Accommodation is not provided but can be arranged. Course instructors Mark Wherry and Simon Crowe say they offer a friendly, relaxed atmosphere in the pleasant surroundings of a large nineteenth-century house in Devon, and have received many positive comments from course participants. Contact them for further info and dates of the next courses.

T +44 (0)1803 762388.
E mark_wherry@clx.co.uk
W www.clx.co.uk/~mark_wherry/slab/

The Drake Music Project

A new national training course has been developed by The Drake Music Project. This charity creates opportunities for people with physical disabilities to make music using ground-

breaking technology, and the new 30-week course provides training in workshop skills and the application of music technology, with particular emphasis on working with people who have physical disabilities. Students will be placed as trainees in a weekly Drake Music Workshop, where a tutor/mentor will help them develop their skills. The course will be launched in early 1999 and will initially be run in London, Manchester and Coventry, at a full cost of £500 (full and part bursaries available). Applications are now being taken for all three centres.

T The Administrator +44 (0)181 305 0580.

Manchester MIDI School

The Manchester MIDI School has become a registered Steinberg Training Centre for the North West. Courses run by MMS include Dance Music Production (one week in duration), the 10-week DJ Course, supported by Vestax and Pioneer, and the 7-month Studio Recording Diploma. MMS point out that their emphasis lies in "arming students with the skills to use in today's recording studios", and say that their sound engineers are "more likely to be programming breakbeats and kick drums than tuning guitars and operating tape machines." MMS tutors have

worked with various 'name' acts, including Björk, New Order, Sasha, the Grid and K-Klass. A full prospectus is available on request.

T +44 (0)161 953 4072.
E mms@mcr1.poptel.org.uk

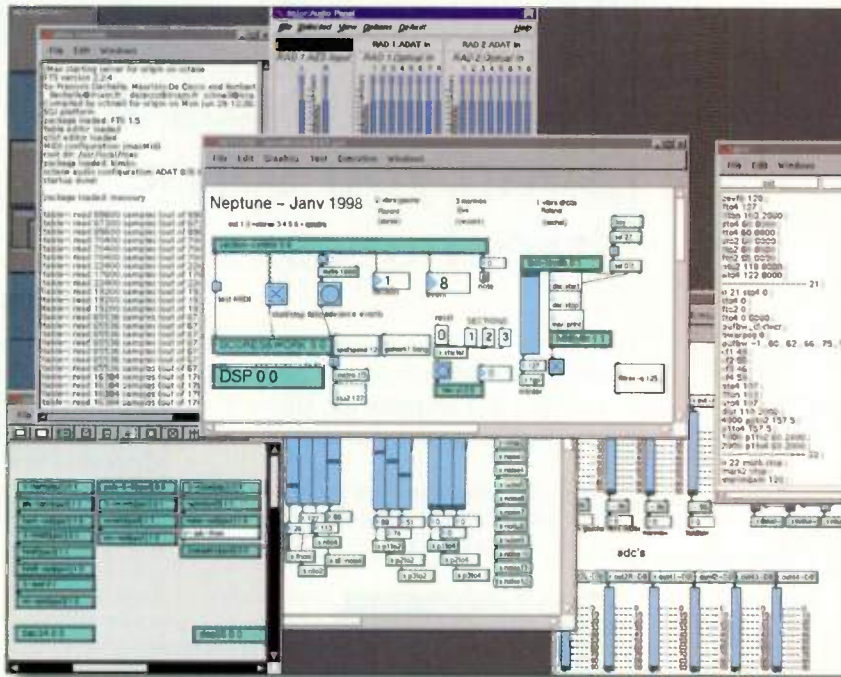
The Institute of Music & Technology

Sound Engineering and Music Technology qualification courses are now being offered by The Institute of Music & Technology as part of the government's New Deal training initiative. This provides the opportunity of free training at Hurricane Studios for candidates who are unemployed. The institute's six studios are equipped with Soundtracs, Soundcraft and Allen & Heath desks, plus digital tape, hard disk recording and PC-based digital editing facilities. Courses started monthly from September.

T +44 (0)181 691 1900.



Director of The Institute of Music Technology Phil McDonnell (in blue shirt, mid-left) with some of his course students.



● DIY DSP

Cutting-edge cross-platform DSP tools from IRCAM

IRCAM (Institut de Recherche et de Coordination Acoustique/Musique), the Paris-based audio research centre, has announced the first public release of *jMax*, an advanced cross-platform software package for music performance and real-time digital audio processing. This a development of Miller Puckette's *Max* software, which is marketed by Opcode, and various IRCAM-based research. *jMax* is currently being developed on Silicon Graphics workstations and the first release is on that platform; Linux, MacOS

and Windows NT versions are also planned. The software is modular and configurable in many ways: users can design graphically complex processing and synthesis patches from sets of objects available in libraries. If you can't find what you need in the library, tools are provided for designing your own objects. Also included is a set of patches for control and DSP, featuring IRCAM's latest cutting-edge DSP technology, including filters, pitch-shifters and harmonisers, simple and interpolated delays, short-term Fourier transform and phase vocoder, pitch and score following, formant analysis and synthesis, granular synthesis, additive analysis and synthesis, modal synthesis, physical modelling synthesis, 3D audio technology and more.

A version of *jMax* can be downloaded, free, from IRCAM's web site. If this basic set of DSP libraries and documentation isn't enough for you, you can register for the fully-featured version, which includes complete documentation, support, tutorials and an extensive set of IRCAM libraries and patches.

T +33 1 44 78 15 40.
E admin-forum@ircam.fr
W www.ircam.fr/jmax/

Musicians In Focus

Demand for access to music technology by visually impaired musicians prompted Jacqueline Clifton and Alan McCulloch to found the Musicians In Focus organisation. While talking computers have been available for some time, and visually impaired people can already use standard Windows programs such as word processors and spreadsheets, it's only very recently that developments have come about allowing a degree of access to music technology. Musicians in Focus aims to research how existing technology can be used by visually impaired people, research and develop new technology, advise and support educational institutions and professional organisations, as well as software developers, instrument manufacturers and individual musicians, and provide a central focus for the exchange of information. The organisation has already run a week of pilot workshops and plans to run more. Contact them for further information.

T +44 (0)171 354 2050.
F +44 (0)171 359 7535.

bullets

New range of rack cases

Hiscox Cases have added a line of 19-inch rack cases to their range. They are constructed from specially designed solid aluminium extrusions for



strength, and feature full-length corner protection, high-quality die-cast locks, and distinctive one-way fitting lids, with large moulded arrows so that you always know which way is up! Full-length integral locating runners facilitate safe gear stacking, and rubber strips help to prevent damage to

furniture. A 4U case is available now at £120 RRP, with 6U and 8U sizes to follow.

T +44 (0)1543 571420.

New shareware XG editor

XG-Gold v1.3b is a shareware Windows 95/98 editor/llbrarian for all Yamaha XG synths and sound modules, developed by Hans-Joachim Stulgies. Supported instruments include the DB50XG, SW60XG, MU10, QY700 and QS300. The software is claimed to offer the "fastest parameter access of all known XG editors", and includes a comprehensive range of editing parameters,

including a random voice generator. Registration is a minimal US\$20.

W xgmidi.wtal.de/gold_e.html

Kinman pickups UK contact details change

Scarcely had *SOS* gone to press last month when the news reached us that the UK distribution arrangements had just changed! Please disregard the telephone details given at the end of last month's review (the price and web address details remain the same), and contact Westside Distribution for any UK sales enquiries.

T Westside Distribution +44 (0)141 337 6833.

the winners take it all

Lucky SOS competition winners receive Harbeth monitors



Simon Campion with his newly delivered DPM1 Pros and MS1 subwoofers.

Simon Campion of Lampeter and Richard Hammerton of Norwich were the lucky first and second prize winners in our December 1997 Harbeth competition, both landing themselves a pair of DPM1 Pro monitors. As the main winner, Simon additionally received a pair of

MS1 subwoofers (as you can see from the pic of him relaxing with his new arrivals). Congratulations to both Simon and Richard, and many thanks to Harbeth Acoustics for donating the great prizes. There'll be more competition results next month, so keep those entries coming...

H Harbeth Acoustics
+44 (0)1444 440955.

broader vision

Studio Vision Pro new features

Opcode's new *Vision DSP*, a MIDI sequencer with basic audio facilities, was launched with several new features that weren't, at the time of release, available on the flagship *Studio Vision Pro*. With the release of *SVP v4.1*, these features are now available, the most significant of which is support for VST-format plug-ins, plus support for a wide range of other PCI cards via new compatibility with VST's ASIO interface standard; supported cards include the Korg 1212 I/O, the Lexicon Digital Studio, Lucid's PCI24 and Sonorus' STUDI/O. *SVP v4.1* is also compatible with Digidesign audio hardware, including Pro Tools 24.

T SCV +44 (0)171 923 1892.

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SPECIAL XMAS INDEX

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Turnkey, Christmas, 1998

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KLAUS SHULZE & POLYMORPH AT TURNKEY!

WEDNESDAY December 2nd will see legendary German synthesist Klaus Shulze launch the much heralded Quasimidi Polymorph at Turnkey's headquarters.

Klaus will be demonstrating the instrument live and be on hand to answer your questions afterwards. The event kicks off at 7pm and entry is by free tickets, available from us on the regular number. Numbers are strictly limited, so call early to avoid disappointment!

See page 8 for more details of the Polymorph.

Christmas Demo Days

By Yul Tyde

TO HELP YOU make your buying decisions over Christmas, we've enlisted the help of the manufacturers' own expert demonstrators. They'll be on hand every Saturday until the end of December to answer all your questions and demonstrate the latest gear. Check out the schedule below for details:

Sat 7th Nov Turb: Beach PC Cards, CakeWalk Software, Twiddly Bix MIDI Files, Fat Boy MIDI Controller.

Sat 14th Nov Yamaha CS1X, AN1X, MX6, QY70, QY700, S11H, SWIRLING, Sibelius Scoring for Windows.

Sat 21st Nov Emagic Logic, SoundDiver, Audiowerk 8, Jackson Guitars.

Sat 28th Nov SoundForge: Acid, Opcode Hardware & Software, Direct X Plugins, Yamaha Acoustic & Electric Guitars & FX.

Sat 5th Dec Cubase, Rebirth, WaveLab & Plug-In, Emu Samplers & Sound Modules, Roland Sound Modules, Keyboards, Groove Samplers, Hard Disk Recorders & MIDI Guitar Equipment, Turb: Beach PC Cards, CakeWalk Software, Twiddly Bix MIDI Files, Fat Boy MIDI Controller, Tascam Portastudio 24, 424 mkII & 564.

Sat 12th Dec Roland Digital Piano & Home Keyboards, Cubase, Rebirth, WaveLab & Plug-In, SoundForge, Acid, Opcode Hardware & Software & Direct X Plug-In.

Sat 19th Dec Sibelius Scoring for Windows.

Plus of course, as exclusive UK agents for Quasimidi, we'll also have a Quasimidi specialist on hand every Saturday, and don't forget the Polymorph launch on December the 2nd!

12 Days of Xmas!

IN ASSOCIATION with Roland, we're giving away one of their products to one lucky customer who visits our store on each of the last twelve shopping days to Christmas! Check out the prizes list:

- 12th Dec Roland SP300 Compact Sampler
- 14th Dec Roland TR707 Stereo Transmitter
- 15th Dec Roland CR300 Computer Drum Machine
- 16th Dec Roland PR300 Professional Computer
- 17th Dec Roland KX72 Synthesizer Pad
- 18th Dec Roland ME300 Desktop Multi FX
- 19th Dec Roland VR300 3 Track Zip Recorder
- 20th Dec Roland AD3 Acoustic Preamp
- 21st Dec Roland CR300 Data
- 22nd Dec Roland PR300 Power Driver Pad
- 23rd Dec Roland DR10 Digital Mixer
- 24th Dec Roland Roland Bag and a perfume in a year draw!



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Turnkey caught in free gear shock!



Stuck stunt. Turnkey staff member with some tasty stocking fillers

By Chris Massey

EXCLUSIVE T U R N K E Y S marketing department have been caught at it again! As if our guaranteed lowest prices weren't enough, we'll be giving away free gear with every telephone order over £100 until the end of the year!

Take your pick from £25 worth of ProTech oxygen free cables, £20 of Quantegy DAT

tapes, the Christmas Pianist MIDI file collection (normally £29), a 35mm sports camera, or even a highly tasteful Turnkey t-shirt!

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your order from receipt to despatch by 24 hour courier delivery service (we even offer a £3.99 postal service for low value & weight non urgent items).

If you don't see what you want on the following pages then give us a call - we can supply virtually any music related product, and our trained sales consultants will be pleased to advise you on all your needs. So make some music this Christmas with a gift from Turnkey, we're sure to have something to suit!

YAMAHA FS1R



future sound of synthesis?

YAMAHA FS1R FM SYNTHESIS/ FORMANT-SHAPING TONE GENERATOR

When Yamaha launched their SY85 in 1992, it seemed like the end of an era. For the first time since the advent of the hugely successful DX Frequency Modulation (FM) synths in the early '80s, here was a Yamaha hi-tech instrument *without* FM in any form. Sample-based synthesis had seemingly taken over the world, and perhaps FM was looking like tired technology at Yamaha HQ. What goes around comes around, however: after all, analogue synthesis has undergone an astonishing renaissance in the '90s, and more recently, retro interest in FM has been bubbling under, with instruments such as the DX100 and TX81Z attaining cultish appeal in techno circles for their FM basses and electric pianos. In current manufacturing terms, though, FM had all but disappeared. Until now, that is...

Apparently out of the blue, Yamaha have released their first new FM instrument for several years, the FS1R. But — and this is an important but — it's FM with a difference. Not only is it an eight-Operator variant (like 1982's trailblazing, megabuck GS1), as opposed to the six- and four-Operator FM of the DX/TX range, but it also incorporates a new, potentially very powerful technology called Formant Shaping Synthesis. Formants are, in this case, the spectral patterns making up the sounds of human speech, so one of the FS1R's great strengths is the creation of vocal-like timbres.

If you've seen any of the limited press info for the FS1R it might come as a surprise to find that this is an FM instrument at all, as the marketing approach seems to be to play down the FM angle and play up the FSS angle. There's one thing you can be sure of: there are no samples anywhere on board, nor is there any physical modelling trying

to convince you the FS1R is a saxophone or a vintage analogue synth.

From The Outside In

The FS1R doesn't break with the traditional rackmount synth module look. Indeed, anyone who knows Yamaha's MU100R/90R will be in familiar territory as far as appearance is concerned, as the FS1R uses a similar casing and an identical display. One major difference between the FS1R and the MU modules is the presence of four control knobs on the far right of the FS, which have different functions depending on the mode of the synth, and can be used for real-time sound modification. Other front-panel features comprise a headphone socket, volume control, a large backlit LCD (with lettering easily visible even from across the room), and a total of 15 small, round editing buttons, arranged in one group of six and one group of nine. Next up are the four knobs, plus two more small buttons which light up red when activated: these select one of two sets of knob control parameters in Play mode. Finally, there's a large, recessed power switch.

The obligatory look at the back panel reveals a power inlet for the *built-in* power supply — whoopee! — plus MIDI In, Out and Thru, and two pairs of stereo outputs.

Inside the FS1R is a synth engine capable of 32-note polyphony and 4-part multitimbrality. These days, four is a pretty low number of simultaneous voices, but Yamaha justify it, quite reasonably, by saying that the FS1R wasn't designed as an all-round studio in a box for the creation of entire orchestral arrangements, say, but rather a dedicated *synthesizer* whose *forté* is interesting, individual sounds. You'd have an FS1R as an addition to a general-purpose workstation, not instead of one.

FM synthesis was the success story of the mid-'80s, and synths based on its principles, like Yamaha's DX7, sold by the bucketload — until affordable sample-based synths arrived at the end of the decade. Now, with their new FS1R, Yamaha have updated the technology for the late '90s. **Derek Johnson & Debbie Poyser** gaze on the new face of FM...



A total of 1408 preset Voices and 384 preset Performances are on board, plus 128 user Voice and 128 user Performance memories. Three separate effects processors are built in — reverb/delay, variation effects including chorus, flange, phase and so on, and 'insertion' effects, including some basic multi-effects configurations — and there's 3-band EQ.

The FS1R & FM

If you're familiar with the workings of any other FM synth, that's a head start when it comes to understanding the FS1R. For those who haven't used an FM synth before, we'll take a brief look at how FM relates to this new instrument.

Put simply, FM synthesis involves the modulation of the frequency of one waveform (the carrier) by another (the modulator). This interaction generates a complex range of subsidiary frequencies, which results in timbral change; the greater the modulation, the greater the change in timbre. As commercially implemented by Yamaha, these waveforms were all sine waves generated by oscillators, and each oscillator (in combination with a series of fairly familiar synth parameters, such as an envelope generator, level, keyboard scaling and so on), was dubbed an 'Operator'. Several Operators — six in the case of the massively successful DX7 — were organised into algorithms, which essentially preset the interaction of the carriers and modulators in a voice. The simplest algorithms laid the six Operators side by side, with no modulator/carrier interaction, offering basic additive synthesis facilities. More complicated algorithms organised the Operators in parallel or serial configurations — a modulator could itself be modulated, for the generation of even more complex timbres. Every algorithm also included a feedback loop, whereby one or more modulators modulated themselves. Algorithms were depicted graphically as linked blocks on the top panel of all Yamaha's FM keyboard synths.

Later FM synths offered variants on these ideas; the Operators on these instruments offered a choice of waveforms, rather than the basic sine wave of (for example) the DX7.

This outline applies pretty well to the FS1R's basic voice architecture, though the new synth is understandably much more complex. Up to eight Operators are configured in an algorithm, and there are 88 algorithms on board (the DX7 offered 32). There's one algorithm per FS1R Voice, and up to four Voices are combined in a Performance.

An FS1R Operator is more comprehensive than a DX Operator, since the basic sine wave is joined by seven other waveform options — or 'spectral forms' in FS1R-speak — including broad- and narrow-band all-harmonics, broad- and narrow-band odd-harmonics, resonant broad- and narrow-band, and formant, for a wider range of potential sounds. Original DX synths lacked a filter, whereas the FS1R includes a very good one, and until late in their run, older FM-equipped synths had little, or nothing, in the way of effects. Again, the FS1R is well endowed in that department.

But it's at the Operator level that the FS1R reveals its complexity and power, especially in the creation of voice-like timbres. In order to accurately emulate the workings of a human vocal tract, Yamaha have provided two sets of formant Operators, eight 'voiced' and eight 'unvoiced', that work side by side in pairs — so you could say that the FS1R is actually a 16-Operator synth. The voiced formant Operators, which are basically oscillators, mimic the larynx, producing the basic sounds, or vowels. Speech needs consonants, however, which brings us to the eight unvoiced Operators. Essentially noise generators (which can be used as such when synthesizing percussion or sound effects), the unvoiced Operators allow the FS1R to imitate consonants.

The FS1R manual says convincing speech can be emulated using three to five formants, so there are evidently enough to be going on with in the FS1R! The synth can even be made to talk (or sing), using so-called Formant Sequences — more on this later.

A La Modes

The FS1R powers up in Play Mode, from which you can select and audition its Performances. There's no separate Voice mode as such: Voices are accessed and edited from within Performances. In practice this is quite elegant and logical, but it may

YAMAHA FS1R £699

pros

- A genuinely different form of synthesis in Formant Shaping.
- Unique, powerful sounds.
- Helpful real-time control knobs.
- DX7 compatibility.
- Four outputs.
- Internal power supply!

cons

- Using the filter cuts polyphony by half.
- User Formant Sequences can't be created anywhere yet, and even if they could, saving them inside the FS1R would cut the Voice memory in half.
- The operating system can be confusing, and the manual doesn't offer enough help.

summary

Despite the odd niggle, the FS1R is an exciting synth you really should hear. Hats off to its designer for developing Formant Shaping and taking a new and very fruitful look at FM.

SOUND ON SOUND

YAMAHA FS1R

► feel strange at first to those accustomed to how other synths work. It has three edit Modes, Performance, Voice and Effect, plus a Utility Mode, for global housekeeping chores such as display contrast, master tuning, and global MIDI options. To audition, or change, individual Voices, you need to access Part Assign Mode, wherein Voices are assigned to Performance Parts (four per Performance), and basic Part parameters such as MIDI receive channel, volume, pan, effects send and note shift are set.

At The Operator & Voice Level

In Voice Edit mode, parameters are divided into two groups — Operator and Common. The former are available for each Operator, while the latter apply to a Voice as a whole. The upshot is that there are lots of parameters!

- **Operator parameters:** Each Operator in an algorithm can be modified by a set of synthesis parameters. The exact parameters vary depending on whether you're editing voiced or unvoiced Operators, and on which 'spectral form' is chosen for the voiced Operators. All Operators, whether voiced or unvoiced, have frequency (pitch) parameters, an amplitude envelope generator (with 'hold' parameter for delaying onset of the envelope), frequency EG (which produces a filter EG effect), and various sensitivity parameters that determine how Operator amplitude and formant frequency respond to velocity, amongst other parameters.

All *voiced* Operators have detuning, key sync and a range of level-scaling parameters. One use for the latter would be to split groups of Operators into virtual 'keygroups' in a Voice, enabling a single algorithm to apparently produce different sounds at different points on the keyboard.

Unvoiced Operators are cut back to one level-scaling parameter, which alters their volume response either side of middle C. This is a shame, because there would have been scope for creating percussion sets with up to eight voices had level scaling been as comprehensively implemented as for voiced Operators.

Formant Operators are a special case, though they do have access to standard voiced-Operator parameters. It's possible to think of a formant Operator as a mini synth, combining an oscillator and filter in one unit, and its sound is shaped by parameters which include centre frequency, level, bandwidth and the amusing 'skirt'. This last parameter determines the shape of the flare at the bottom of a formant's bell-shaped response curve — higher values produce a wider skirt!

Unvoiced Operators don't have quite as many parameters as voiced, but they do have the same bandwidth, resonance and 'skirt' parameters, and can even be made to resonate to self-oscillation. During the review, this latter feature was used to provide a couple of excellent sub-oscillators that, whilst almost inaudible when solo'd, added weight and body to the main sound.

- **Common parameters:** Additional modifications can be made to an algorithm as a whole, using the

so-called Voice Common parameters. Included in this set of parameters are two LFOs, a pitch EG, and a filter. The latter is in addition to the filter-like parameters available to each formant Operator, and is more like a VCF on an analogue or S&S synth. It's rather well-specified, with low-pass (12dB, 18dB or 24dB per octave), high-pass, band-pass and band-reject options, plus cutoff frequency and resonance controls, and even comes equipped with its own EG. Using the filter does have one unfortunate side-effect, however: bafflingly, it cuts a Voice's polyphony in half.

At The Performance Level

Performance editing parameters are organised, as are Voice parameters, in two groups — Common and Part.

- **Performance Common** parameters treat all four Parts in a Performance, and include individual output assignment, controller assignment (whereby various control sources, including the front-panel knobs and various incoming MIDI controllers, can be used to alter parameters in real time), and the choice of Formant Sequences (FSeqs).

FSeqs are what allow the FS1R to 'talk' or 'sing' recognisable words or phrases. This is achieved by sequencing the frequency, fundamental pitch and level for each voiced/unvoiced formant pair. Only one FSeq per Performance is possible, so Voices will never say or sing anything too complicated, although the presets manage phrases such as "I Love You", "Yamaha FS1R" and "Are you ready?". A nice touch is that playback speed of phrases can be increased or decreased, and even sync'd to MIDI clock. And since the sound of formants isn't pitch dependent, speed and pitch can be varied over a wide range without altering the basic

MIDI Control

The FS1R responds to incoming MIDI note data, velocity, pitch bend, mod wheel and aftertouch, and has a comprehensive system for routing MIDI controllers to FS1R parameters. Per Performance, up to eight parameters can be tweaked over MIDI, using up to eight of the following as control sources: the four knobs (which also respond to and transmit MIDI data), mod wheel, aftertouch, foot controller and breath controller, pitch-bend, and four MIDI controllers of your choice. Assignments can be switched off for each Part in a Performance, which is great if you want the filter cutoff altered for one Part, but not the others, for example. The manual is rather confusing about MIDI control — you learn much more by just doing it. A section of the display aims to assist in keeping track of which controllers are active and which controllers are assigned to which Parts; in practice, this does help, but the graphic is quite small, so it's necessary to peer closely to get an idea of what's assigned where.

Favourite Sounds

With over 1400 Voices and nearly 500 Performances on offer, you could spend a long time just checking out the FS1R's presets. Here's a necessarily small selection of our favourite Performances.

- **Performance A 074 Solstice:** an amazing wave-sequencing-like effect that sounds as though it couldn't be possible with FM. Upon examination, we found that each of the Operators had been treated as a single oscillator, with its envelope delayed to fit into the resulting pattern. Simple when you know how it's done, but quite remarkable. We asked Yamaha whether a rhythmic Performance like this could be sync'd to MIDI clock, and the answer was no — but perhaps in a future update?
- **Performance A 006 Hollywood:** probably meant to have a Jan Hammer/Miami Vice feel, this Performance is another eye-opening example of what can be done with the FS1R. It sounds almost like a complete track in itself, with a drum part made using an FSeq and a chugging, menacing 16th-note pad sound.
- **Performance A 009 Platipus:** convincing
- **Performance A 030 Power Key:** powerful, distorted FM electric-piano type sound with a real Roxy Music-for-the-'90s edge. Use sparingly for best effect.
- **Performance A 066 Furry Bell:** pretty, delicate bell sound at higher pitches, with a soft halo of echoes.
- **Performance A 121 Drum Kit 1:** surprisingly solid kick, lovely, bouncy snare, and open and closed hi-hat simulations.
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- **Ladies & Gentlemen,** may I have your attention please?: this cute, wistful synth voice isn't actually a preset, but is part of the synth's 'Vocodrone' Demo. If this demo is selected and then demo mode exited, the Performance used in it remains in the edit buffer, whereupon it (and its constituent Voices) can be saved in the user memory.

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best
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YAMAHA FS1R

- ▶ timbre of the sounds — try *that* with your sampler! FSeqs can also loop, with Performance B 013 Shooby Do a prime example: it sings 'shooby do wop', with the 'wop' bit looping if a key is held down. This Performance also illustrates a nifty triggering option, where the FSeq is triggered by the first key press; as long as one of the first keys pressed is held down, the loop will kick in, and you can play tunes within the FSeq without retriggering the phrase.

Unfortunately, FSeqs are a silver cloud with a grey lining: there are 90 preset FSeqs, which provide a wide range of actual phrases, fun gibberish, laughing and, surprisingly, arpeggio and drum patterns, but there are only six memory positions for your own FSeqs. And it gets worse: there's no way of creating your own FSeqs on the FS1R. A software editor — whether from Yamaha or a third party — will offer the only solution, and none is available yet. And if you *could* save your own FSeqs, doing so would halve the user Voice memory — you'd have space for only 64 of your own Voices instead of 128. This takes some of the shine off what may be one of the most exciting aspects of any new synth of recent years. If there's a way to fix this with a software or hardware update, Yamaha should be urged to try to find it. We hear that there's a development tool which turns WAV or AIFF files into FSeqs, and it would be fabulous if the public could have access to that — imagine, you could sing or say something and have it transformed into an FS1R synth voice!

▪ **Performance Part** parameters: Even from within Performance Edit, it's possible to tweak many of an individual Voice's parameters (for example, LFO speed, filter cutoff, resonance and EG depth, EG attack, decay and release times). However, when you change, say, LFO speed for a Voice within Performance Edit mode, all you're actually doing is adding an offset to that Voice's stored LFO speed value. The Voice itself will sound as though it's been edited, but remains unchanged — only the offset value is stored as a Performance edit. This is excellent and means that you can tweak away to your heart's content at Voices in a Performance, secure in the knowledge that you won't have screwed up that Voice or its appearance in any other Performance.

An easy way of tweaking a Performance without venturing too deeply into the OS is to use the four front-panel knobs to alter a total of eight

Effects

The FS1R's complement of four effects processors is comprehensive enough, with a straightforward signal path. There's a 'send' for each of the global effects (reverb/delay and variation) from each Performance Part. In addition, an insert effect can be switched into any (or all) Parts, allowing a single Part to be treated with a different effect than the remaining three Parts. This is a good, modern,

touch, but how much nicer if there had been four insertion effects! Insert effects include some simple multi-effects, as well as various modulation, delay, and distortion options. In addition, there are some cross-patching parameters that pass the variation effect through the reverb/delay, and the insert effect through the variation and/or the reverb/delay. As mentioned elsewhere, a fully parametric three-band EQ is also counted amongst the effects; this is global for all four Parts.

parameters (four preset and four you can assign yourself) for all four Parts at once. As above, when a Performance edit made with the knobs is saved as a new Performance, the constituent voices remain unscathed.

There are a few parameters which are unique to Performance edit mode, covering pitch settings (detune, note shift), portamento, pitch bend, note assign, polyphony reserve, mono/poly mode, plus high/low note and high/low velocity values, for splits and velocity layers.

FS1R In Use

Programming and editing the FS1R is very different from programming and editing an S&S synth. For a start, there are no banks of raw samples as a basis for programming — instead there are 88 eight-Operator algorithms. You don't know what any of the algorithms are going to sound like until you play through them, and a few suggestions in the manual for what each might lend itself to would have been nice. The display does attempt to help, but the graphic it uses to display algorithms is so small it's practically invisible unless you're all but on top of the synth.

Of course, when programming a bass-type sound, say, you'd start by tweaking a bass preset, and realistically many people will start their own sounds from one of the 1400+ factory presets. DX7 *aficionados* will like the fact that the FS1R has almost complete compatibility with 6-Operator FM synths: you can send, via MIDI, a patch from a DX7, for example, and the FS1R will convert it to an identical-sounding patch in the new synth. A lot of the preset Voices actually come from the DX7's library. It's also possible to program sounds from DX7 sound charts, finding an algorithm that has an equivalent layout to the DX algorithm and turning off the unwanted Operators.

The FS1R isn't the friendliest synth to program. Changing parameters from the front panel can be a bit tricky — the buttons are small, the display isn't ideally suited to the synth, and the many parameters are organised in a hierarchy that's often three levels deep. However, there is an alternative to pecking at the tiny buttons, since the four knobs can scroll through Performance Parts or Voice algorithm Operators, navigate menus, select from lists of parameters, and change their values. And there are nice touches: individual Parts in Performances and individual Operators within Voices can be muted or solo'd in order to fine-tune

Documentation

The main user manual is surprisingly thin at 88 pages. There's also a separate data list giving the FS1R's MIDI implementation and listing preset Performances, Voices and FSeqs, plus effect parameters and a handy list of controllers, for use when assigning MIDI and knob controllers. The FS1R's documentation is completed with an algorithm card.

The manual isn't one of Yamaha's best, suffering from a less than comprehensive index and a few organisational problems. A few more explanations of the parameters wouldn't go amiss: those with FM experience may know how to use Level Scaling of Operators to create timbral splits, but you wouldn't necessarily be able to work it out from the manual, for example.

Swotting Up On FM

When the DX7 was first released, it was known as much for being hard to program as it was for offering a completely new synthesis system. In retrospect, it's not quite as difficult as it once seemed. After all, FM happened at the dawn of parameter access, before we'd all got used to doing without dedicated knobs and buttons, which probably helped to give it a reputation for inscrutability it didn't fully deserve.

Part three of Paul Wiffen's Synth School series (*SOS* September 1997) goes into great detail regarding FM synthesis. If you want more, check out the digital synthesis chapter of *SOS* contributor Martin Russ's *Sound Synthesis and Sampling*, available from *SOS* mail order.

information

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an edit, a Search button quickly finds themed Voices or Performances within named categories, and the Play button provides a quick audition of whatever you're editing. The display, though obviously borrowed from the MU family, provides some help: the bottom strip shows MIDI channel, category setting and volume level, amongst other useful information.

But any OS shortcomings the FS1R has are mitigated to a huge extent by the sounds it can produce. It really does sound like no other synth — both lush and digital at the same time, without being thin or cold. If you were to compare its character to anything, in some ways it's rather like the super-expensive digital synths of the '80s, such as the Synclavier and PPG Wave. Loads of presence, loads of depth, a big sound that's bright without being strident. Some of the factory presets knock you backwards on first hearing (the 'Favourite Presets' box gives a personal 'best of' selection), without being gimmicky. The presence of unvoiced formant Operators introducing a noise element even allows drum-like timbres to be produced from a synth that has no drum samples.

Some might say the Formant Sequence presets *are* gimmicky, and no doubt they'll be appearing all over chart records within a very short space of time. But they're great fun, reminding of Kraftwerk and Electric Music, in the way that something that's not quite human, but not quite electronic, seems to be speaking and singing. The FSeqs almost give the FS1R a personality, and will become much more than a gimmick when some way for users to create their own is introduced.

Remember, too, that the FS1R's formant Operators are not just confined to voice-like timbres — they can make almost any type of sound feel more 'real', partly because the formant component of an FS1R sound is completely independent of pitch. Thus sounds using formants will play much more naturally at the extremes of the keyboard than sample-based sounds.

Conclusion

Genuinely novel synthesis systems are increasingly hard to come by. The last big new thing was physical modelling, and its main task these days seems to be recreating decades-old analogue technology. The FS1R isn't *completely* revolutionary — it features a development of 15-year-old technology, after all — but it does manage to offer a sound and method quite unlike any other synth on the market. Even for those who don't want to do in-depth programming the FS1R has lots to offer; there are tons of quality presets, which can be easily layered into new Performances and then tweaked with the front-panel knobs, all with no real knowledge of FM needed. And though programming enthusiasts will probably find that the FS1R requires a bit of effort to come to grips with, the results should more than repay their time and trouble. Formant Shaping, in particular, is a serious, exciting achievement on the part of this synth's designers and a breakthrough at any price, let alone at £699. Looks like FM's back to stay! **EOS**

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20 tips on...

using microphones

If your music involves acoustic instruments or voices, the ultimate quality of your recordings depends entirely on your microphones and what you do with them. The good news is that a well-positioned cheap and cheerful mic can often outperform a poorly-positioned thousand-pound microphone. Also, how you look after your mics, and how you rig your studio, can make a lot of difference to the smooth running of the session. Looking after your mics and positioning them carefully is the key to capturing great sounds.

1. Some microphones have very characteristic 'sounds' — presence boosts, very full bass or whatever. These characteristics can be helpful in specific applications, but generally restrict what you can do with the microphone. Better to choose a very neutral-sounding mic, and use positioning (or equalisation if you must) to create the necessary sound character.

2. Capacitor and electret mics don't like dust, smoke or humidity, all of which will affect the sound quality whilst in that environment and, in the case of dust and smoke, progressively and permanently degrade the microphone diaphragm. Decent mics are expensive so it pays to look after your investments. If you suspect the performance of your microphone is not as good as it once was, consider returning the mic to the manufacturer or a specialist company for servicing and to have the diaphragm cleaned.

3. Always handle mics with care — not style! Put them away when not in use, don't drop them, and never slam the lid on their boxes or you could split the diaphragm. Ideally, keep your microphones in a closed foam-lined box after use and store them somewhere warm and dry. If you don't want to keep packing and unpacking your mics, do as many professionals do and leave your mics on stands at the side of the studio with appropriately-sized freezer bags over them to keep the dust out. The pros also leave them plugged in to the console at all times, so that they are phantom powered and therefore stay warm, thereby avoiding humidity problems.

4. Dynamic mics tend to have less dynamic ability, with a 'softer' top end, than capacitor or electret mics, but are far more capable of taking abuse from loud instruments or rough handling. So in applications where a 'warmer'

or 'fatter' sound is required (eg. on drums or a thin-sounding vocalist), or in front of very loud sources, a dynamic mic is often a good choice.

5. Capacitor and electret mics tend to be more sensitive, sound 'faster' and generally more neutral, and so make a good choice when you are trying to capture subtle nuances in a sound. Small-diaphragm capacitor mics are generally more neutral and accurate than large-diaphragm mics, which generally tend to exhibit a warmer and fuller nature.

6. Electret mics can often be powered either by an internal battery or phantom power. Given the choice, phantom is the preferred way to power the mic, firstly because it avoids the problem of a battery running flat part way through the best take, and secondly because the head-amp inside the microphone will have more headroom and less noise. If your mic must be powered by a battery, remove it when not in use, so that the battery contacts are wiped clean by the action of inserting and removing the battery. The mic draws such a small current that any corrosion on the terminals could degrade the performance of the head-amplifier. Allow electret and capacitor mics to warm up for a few minutes before any critical listening.

7. And talking of head-amplifiers inside capacitor and electret microphones, these are generally designed to cope with a 'normal' range of sound pressure levels. If you place the microphone very close to a loud sound source, this head-amp can easily be overloaded, producing distorted sound. Many capacitor mics either have switchable attenuators or special attenuating modules which can be inserted between the capsule and preamp body. If in doubt, use the attenuator — better low level, which can be corrected at the console, than a distorted sound, which cannot!

8. Don't forget to shut the faders on the console or to mute the speakers when you reposition microphones, re-plug, or switch phantom or battery power on to them. Anyone waiting in the control room while you sort out the studio will be very unimpressed (not to mention

It doesn't matter how good the microphone, put it in the wrong place and you might as well be using cocoa tins and string.

Hugh Robjohns shares some of his top tips...



Pop shields are a cheap and invaluable aid when recording vocals.



Phasing is crucial when it comes to drum miking, particularly if you're combining mics above and below a snare drum.

deafened) by the thumps, pops and bangs, and it can be very embarrassing on your return to find the charred remains of the woofer cones hanging out of the monitor speakers!

9. When adjusting the position of a microphone on a boom stand, never force the clamps, because they will quickly lose their ability to hold position. Better to loosen all the clamps, allowing complete freedom of movement to position the mic exactly where you want it. Then tighten everything up again, starting at the column, followed by the knuckle and boom arm. If your stands are in good condition, you won't need the strength of a gorilla — just a firm twist will be sufficient to make sure the stands don't start drooping halfway through the session.

10. Possibly the most important thing to remember about using a boom stand is to ensure that one of the three legs is positioned directly below the arm. This guarantees that it will be stable and prevents it from toppling under the weight of a heavy mic. You can make life much easier for yourself if you don't wrap the mic cable around the stand like a boa constrictor. A single turn up the vertical part

of the stand, and another along the boom is quite sufficient to look neat and tidy whilst making it much easier to adjust the stand should you need to reposition the mic. Coiling the spare cable under the mic stand allows the stand to be moved to a new location easily, and makes it much easier to trace cables back to the connector panel on the wall or multicore breakout box if you need to re-plug or replace a faulty cable.

11. It is important to isolate microphones from physical shock (especially omnidirectional mics) as subsonic and low-frequency noise will reduce headroom significantly. Be aware that few nearfield monitors are capable of revealing what is going on below about 60Hz, so if you see peaks on your meters which don't seem to correspond to the sound, suspect LF rumbles — often from a tapping foot! Ideally, isolate the mics with purpose-designed shockmounts, but placing each leg of a microphone stand on dense foam pads can help a lot too.

12. The usual reason for using any kind of directional mic is to gain separation from an unwanted sound source. Remember this when placing the mic, because what you aim the

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► **thing away from** is far more important than what you point it at. Think about the polar response in three dimensions and position the mic so that the unwanted sound approaches its least sensitive angles. These are directly behind on a cardioid, to the sides on a figure-of-eight, and on the edges of a rear-facing cone for a hypercardioid.

13. At a given price, an omnidirectional microphone often has a more neutral sound and a more extended bass response than a directional one. However, because it has no ability to discriminate against unwanted sound sources, it must be positioned at less than around half the distance of any directional mic for the same amount of spill or room sound. So if you are happy to close-mike a source, don't discount using an omni, which will often sound less coloured than a cardioid, for the spill penalty will probably be negligible. Don't forget that many (cheaper) omnis tend to become quite directional at high frequencies, so try to keep the main sound source on-axis.

14. All directional mics exhibit some degree of proximity effect (bass boosting, which becomes stronger the closer the mic is to the source). This can be used to advantage if you want to warm up a sound in a more natural way than with EQ, but beware putting mics close to a moving source, because the character of the sound will vary as they move. Dancing vocalists and swinging guitarists are often uncontrollable!

15. The ultimate quality of your recording is partly dependent on the quality of your microphones. Following the principle of rubbish in, rubbish out, the better your mics, the more accurate your recordings can potentially be, and the more subtle detail they will contain. Top-quality professional mics typically cost between £500 and £1000 — which adds up to a significant proportion of most project and home studio budgets. Pros might use ADATs and 02Rs too, but a key reason for the high quality of their recordings is the quality of their mics....

16. Where you place the mic is the single most important and creative aspect of recording music. Take the time to experiment and the care to get it right. I can never stress enough how important it is to go into the studio and listen to the sound source from all directions before thinking about how, and from what angle and distance, to best capture that sound with a microphone. Moving a microphone as little as an inch can radically alter the sound it captures. Getting the mics in the right places doesn't guarantee a great recording, but get them wrong and you'll never achieve that nirvana.

17. Always try repositioning or replacing a microphone before reaching for the equaliser. It might take a little longer, but the results are superior. Equalisation is intended for creative modification of a sound, not for creating it — that is what you choose and position mics for! Reducing spill by thinking about the positioning of the mic and the appropriate selection of polar patterns while you are rigging is actually far quicker than having to set up noise gates. It also sounds much better, and is usually more effective and reliable. Don't forget that you can often minimise spill at source by thinking about how to position the instruments in the studio, so that unwanted sounds always arrive on the dead axes of the microphones (see tip 12).

18. The best way to check adequate separation between the mics is by listening to each instrument on the mics in front of all the others. The spill should be at least 12dB below the typical level of the mic's own source. If not, reposition the mic, choose a different polar pattern, reposition the instruments, or introduce screening. If that doesn't work, you will have to try EQ or possibly gating! After the session, try to figure out what went wrong and improve on it the next time!

19. If you really are stumped about where to put a mic, a handy rule of thumb is to place it as far away from an acoustic source as the longest dimension of that source. So in the case of an upright bass, for example, try to locate a good-sounding positioning about four feet away. Most acoustic instruments need space for all elements of their sound to gel and take on their correct proportions. Miking too close will tend to emphasise the mechanical noises of fingering, bowing or valve clicks, as well as distorting the balance of the fundamental and harmonics.

20. A common problem when recording vocalists, particularly if they are more familiar with live performance than studio work, is of that they can get much too close to the microphone, causing popping, sibilance, excessive bass boost, and creating humidity problems. Very large foam windshields might help, but a separate pop shield (the nylon stocking on a wire frame idea) mounted four or five inches in front of the mic is better. An alternative technique is to rig a microphone for the vocalist to 'eat' with a second mic positioned something like eight inches further back and six inches higher. Normally you would record only the sound of the distant (normally a decent capacitor mic), but if you rig a conventional live-performance dynamic model as the close mic and mix in some of that mic's signal, you can achieve a more interesting and slightly aggressive sound! **ES**

“The good news is that a well-positioned cheap and cheerful mic can often outperform a poorly-positioned thousand-pound microphone.”

Bonus Tips On Drum Miking!

- Positioning a bass drum mic can be awkward on a stand, and if the kit creeps across the floor it make come into contact with the stand introducing mechanical shock into the mic. Instead, if the front skin has a hole, try laying a mic on a cushion inside the drum, but experiment with positioning fore and aft, and side to side, to get a good sound with the right combination of body and beater click. If an individual drum sounds great when solo'd but poor when the other mics around the kit are faded up, this could be down to phasing problems; try reversing the phase of the nearby microphones. This can be particularly important when combining mics above and below the snare, for example.
- For a rock drum sound, try balancing the close mics first and add the overheads to improve the clarity of the cymbals. For a live or jazz drum sound, use the overheads for the main balance and add close mics for a little extra focus. In both cases, take care to match the panning of the close mics to their stereo positions defined by the overheads.

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NEMESYS GIGASAMPLER

sample and hold

Anyone who has ever tried to replace real instruments with sampled versions will know just how much memory they tend to use. Many professional musicians find themselves filling the entire 32Mb (or more) of a hardware-based sampler with a single acoustic piano, and often find themselves using two or three samplers running simultaneously. The problem is that many acoustic instruments sound odd if transposed by more than a few notes, which means that lots of samples are needed to reproduce the full range of the instrument. This in turn means that each sample has to be shorter to fit in a certain size of RAM. Continuous sounds have to end up with shorter loops (giving a bland sound), and long one-shot sounds have to have their end portions looped to achieve realistic decay times.

Nemesys Music have designed *Gigasampler* to avoid these memory restrictions altogether, by directly streaming audio from hard disk as required — so the only restriction on sample length is the size of your hard drive (up to 18Gb apparently!) Another advantage of this technique is that loading times are greatly reduced, since rather than having to load sounds completely into RAM, they are always available, and RAM is only used for the buffers needed when running the software.

As long as you have enough space available on your hard drive, *Gigasampler* looks like a very

NEMESYS GIGASAMPLER v1.5 PC SOFTWARE SAMPLER

Imagine a sampler with almost unlimited memory that doesn't cost a fortune, and runs on a PC using a standard soundcard. **Martin Walker** installs *Gigasampler*, and prepares to be amazed.

attractive solution to a real problem, especially since it outputs audio via the PC soundcard, so no extra hardware is needed. All of the advanced functions of a typical hardware sampler are available, including 64-voice polyphony, 16-channel multitimbral MIDI operation, resonant filters, envelopes, LFOs, and looping.

An extensive sample library is provided with the package (including a 1Gb Yamaha C7 grand piano, and samples from *Steve Stevens' Guitars*, *Bob Clearmountain Drums 2*, *Ultimate Strings*, and *Will Lee Bass*), and an extra bonus is provided in the

NEMESYS GIGASAMPLER £599

pros

- You need never run out of sampler space again!
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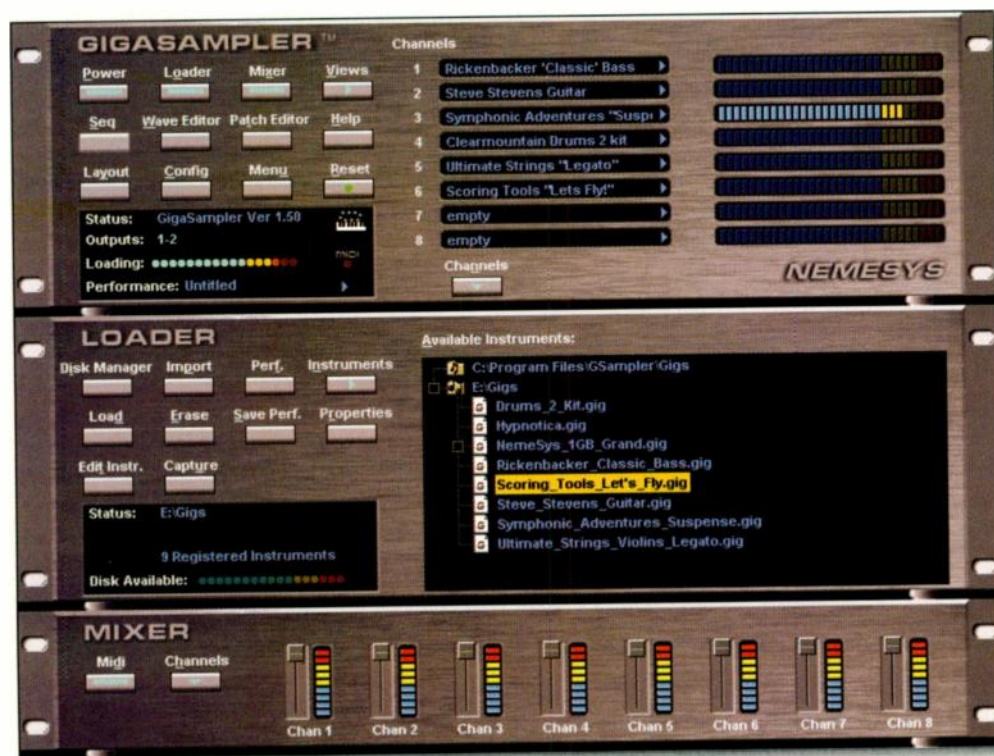
cons

- Realistically needs a powerful PC and a huge hard drive.
- More expensive than most MIDI + Audio sequencer software.
- Tricky to run on the same PC as hard disk recording software.

summary

An inspiring piece of software which overcomes a fundamental limitation of traditional hardware samplers — but a large investment of time and/or money may be needed to get the most from it.

SOUND ON SOUND



It looks just like a rack of sampling gear, but this is the *Gigasampler* main screen, showing the main Console, Loader, and Mixer modules, currently loaded with 150Mb of sounds, and ready to go.

form of the *S-Converter* utility, which allows any Akai S1000 or S3000 format CD-ROM to be read directly, using either a SCSI or EIDE CD-ROM drive. In addition, SMDI sample transfers are available over SCSI, as well as SDS sample transfer over MIDI, for those who already have hardware samplers that support these standards. Since the initial *Gigasampler* 1.0 release some months ago, Nemesys have been beavering away on version 1.5, which is reviewed here. The program now runs under Windows 98 and features multi-output support with the Aark 20/20 soundcard (more on this later), as well as various other new features.

Installation

As you might expect, taking advantage of such a product needs a huge amount of hard disk space, and a minimum of 2Gb is advised (see box for other hardware requirements). You can choose between Full, Compact, and Custom installs, which differ mainly in the number of instrument sounds that are installed. The program files are best installed on one drive, with the instrument (.gig) files stored on the fastest drive you have for best performance. You will not really achieve the full potential of *Gigasampler* unless you have a vast acreage of available disk space, and with hard drives currently only costing about £40 a gigabyte you would probably benefit from adding another drive specifically for use with it.

However, the most important thing to note is that *Gigasampler* needs a soundcard with native Microsoft DirectSound drivers, or one specially designed to be *Giga-compatible*. Make no mistake, unless your soundcard is such a beast you will not be able to run the program — judging by comments on the Internet, some people have ended up having to buy a second soundcard to do this. Emulated drivers will not work — for instance, my Event Gina didn't even show up in the list of available outputs, since it doesn't yet have DirectSound drivers available.

The Nemesys web site has a page which lists specific recommended options: these include the Turtle Beach Pinnacle, Aardvark Aark 20/20, and Creative Labs AWE64 Gold, using its S/PDIF output and an external converter like the Midiman Flying Calf. The Aark 20/20 card (reviewed in the August '98 issue), is a particularly interesting collaboration, since this now has *Giga-compatible* drivers, and provides multi-client, multi-output support, so that each of the 16 MIDI channels can be allocated to any of its 10 outputs as required. If you were thinking of buying an Aark 20/20 anyway (at £999), the addition of *Gigasampler* will give you a software-based sampler with wonderful audio quality, as well as eight analogue and two S/PDIF outs.

However, the beauty of DirectSound is that its outputs are available to different applications simultaneously — you could for instance allocate four of them to *Gigasampler*, and the remaining six to *Cubase*. The main disadvantage of this would seem to be that DirectSound can only currently be used for playback in *Cubase*, which is fine during mixdown, but not during recording.

For optimum sound quality, I used my AWE64 Gold with *Gigasampler*, but connected its S/PDIF output to the S/PDIF input of my Event Gina (with S/PDIF Input Clock selected), and then enabled direct monitoring for this input.

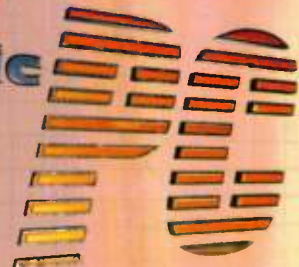
Getting Started

Gigasampler's main screen departs from the normal Windows format to mimic a rackmounting hardware sampler. I am always a little sceptical of this approach, since you lose the

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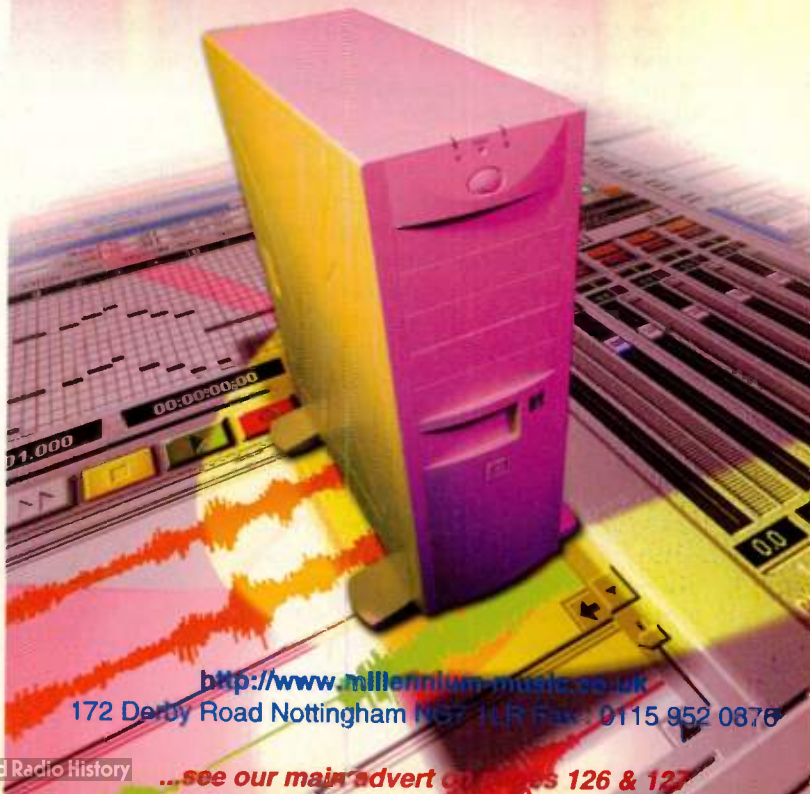
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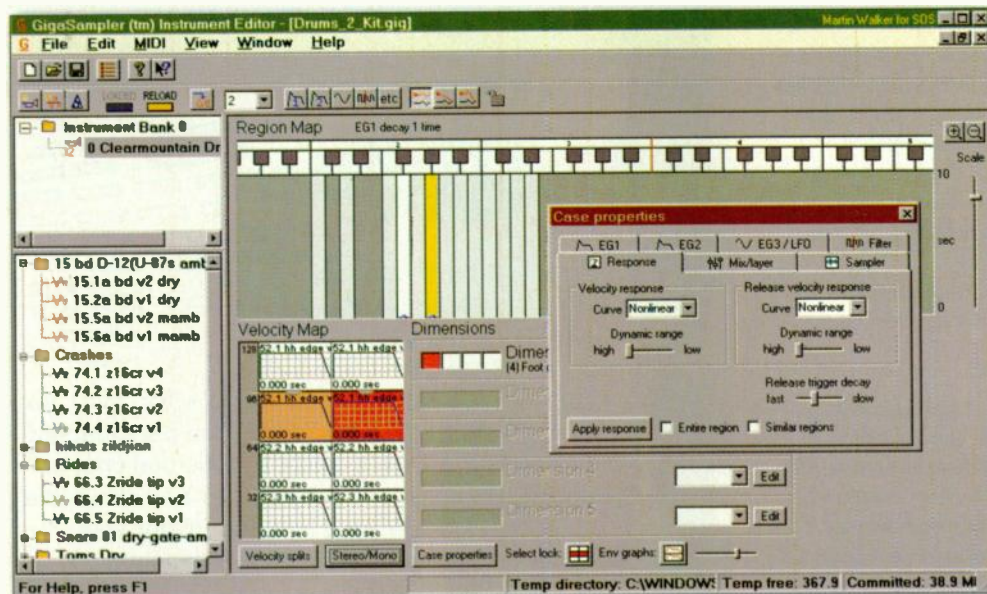


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NEMESYS GIGASAMPLER



The Instrument Editor provides access to a host of parameters, including the Wave Pool, velocity mapping and response, filters, envelopes, and LFO.

▶ instant familiarity of the Windows interface, and this can initially make finding your way around more difficult. This one, however, is well designed, quick and easy to use after the first couple of minutes, and has the advantage of not taking up too much screen space if you run it alongside a sequencer.

There are three main sections: the Console, the Loader, and the Mixer, and both the Loader and Mixer appear as extra 'rack units' that can be shown or hidden as required, by clicking on the appropriate buttons on the Console. The Mixer simply shows a fader and meter for each MIDI channel (the Channels button toggles the display between channels 1 to 8 and 9 to 16) so that the relative output levels of each instrument can be adjusted.

The Loader coordinates disk storage and instrument selection — the biggest difference between *Gigasampler* and most hardware samplers is that the sounds are streamed direct from a hard drive as required, but of course this does mean that the sounds must be on the drive first. This seems obvious, but if you already have a library of Akai format CD-ROMs, these will need importing first before you can access them (*Giga*-compatible sound libraries can be streamed direct from CD-ROM, unless the library is split over more than one disk). Nevertheless, once on your hard drive, sounds will take far less time to access than they would loading into the RAM of a traditional sampler.

Using the Import button on the Loader module, you first choose from three formats of instrument. The sounds on the supplied CD-ROMs are all in *Gigasampler* format — 200Mb on the install CD-ROM, 650Mb connected with the famous 1Gb piano, and a further 600Mb of demos from various other collections. *Gigasampler* Multi-Disk format can span several CD-ROMs, and Akai S1000 and S3000 formats launch the *S-Converter* utility (more on this in a moment). Once you have selected a destination drive and directory, you click on Import and choose an instrument. Since importing speed is largely dependent on the speed of your

CD-ROM drive, it's possible to get much faster import speeds than with current Akai samplers, which can have difficulty working with drives greater than about 10x speed.

Other buttons on the Loader module include Save Perf. (Performance), which saves information on multitimbral sets of instruments (and mixer and configuration information if required), and Perf., which allows you to view them. Disk Manager lets you profile your drives (ie. scan them for *Gigasampler* instruments), as well as Adding, Deleting, or Changing GigaWorkSpaces, the drive and paths where files are stored. The Status window shows the default workspace, the number of registered instruments available, and a bar display showing the amount of disk space used.

Once you have registered instruments sitting in your hard drive, you can view them in the main Available Instruments window of the Loader. To load one of these into an available MIDI channel on the Console, you select it and then click on the Load button, or double-click on the selected instrument. A right-click with the mouse gives more options, including More Information, which brings up a specific instrument help file (if available) with note ranges, details of any MIDI controllers, special effects, and so on.

Once you have loaded a selection of instruments, and mixed their levels, you can hide the Loader and Mixer sections, leaving just the Console on display. The Status window of this section shows the version number and which available soundcard outputs have been allocated, and the Loading bar display shows how much of your RAM has been used for buffers. There is also a MIDI In LED to show that your keyboard data is being received, and a MIDI Loop icon, which animates when MIDI communications are active.

Sound Editing

Various other applications can be launched from the *Gigasampler* Console to perform specific duties. The Seq button launches your choice of ▶

An Ever-Expanding Range

Just as we were going to press, Nemesys sent me brief details of the imminent release of *Gigasampler LE* (Lite Edition), which as its name suggests is a cutdown version selling at a cheaper price. In essence, the main engine is identical, providing the same 32-bit audio processing and huge sampling capabilities, but with a maximum of 48-note polyphony rather than 64, without the Audio Capture feature, and only supporting two hardware channel outputs (this only currently affects Aark 20/20 users).

The projected low price of £169 in the UK also reflects the fact that the bundle is much smaller, with the omission of *Sample Wrench*, the Gigabyte piano, and the *S-Converter*. These will still be available separately, as will upgrades to the full version of *Gigasampler*. I personally think that this version should sell and sell at the price, since it still provides what most people need without significant limitations, although the *S-Converter* option will still be an essential purchase for anyone with an Akai-based sample library. To this end, a third version of the program is being released too, which comprises *Gigasampler LE*, but does include *S-Converter*.

Specification

- MIDI: 16-part multitimbral.
- Polyphony: up to 64 notes.
- Supported sample rates: 32kHz, 44.1kHz, 48kHz (dependent on soundcard).
- Audio processing: 32 bit.
- Filters: low-pass/band-pass/high-pass with dynamic resonance.
- Envelope generators: EG1 (AHDSR), EG2 (ADSR), EG3/LFO.
- Looping: yes (if required!)

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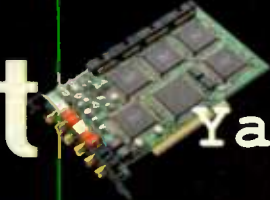
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NEMESYS GIGASAMPLER

► sequencer software, the Wave Editor button launches *Sample Wrench XE* (more about this later), and the Patch Editor button launches the supplied *Gs.exe* editor for turning a clutch of WAV files into an instrument.

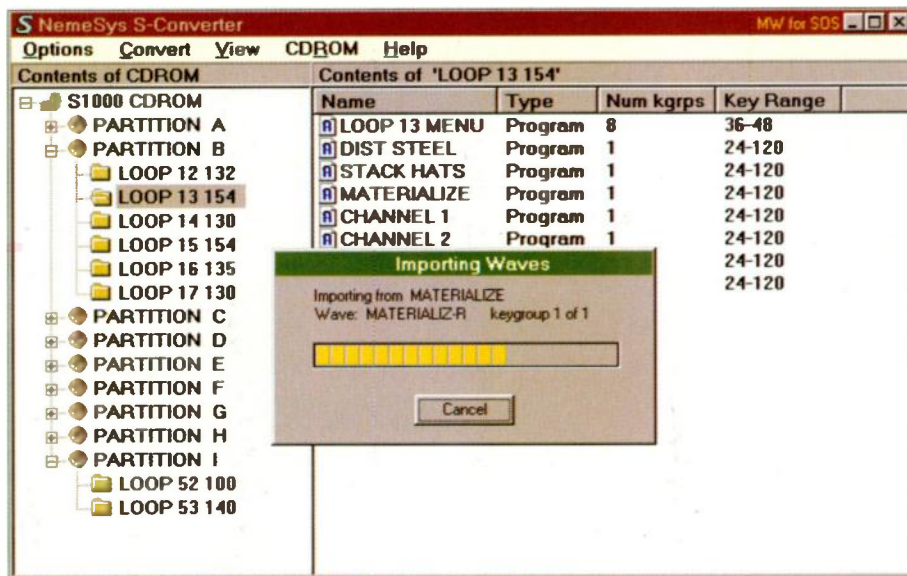
This Patch Editor provides access to every parameter you can think of, and a whole lot more. A sizeable part of the printed manual is taken up with explaining the intricacies of Drag and Drop Mapping, Layering and Crossfade Layering, Resonant Filters, and Envelopes. One particularly interesting feature is Dimensions, which allows different sets of samples to be triggered depending on the status of controllers such as the mod wheel and MIDI controllers. For instance, this allows you to have separate sample sets available to a piano with the sustain pedal up or down, or to switch between different sounds depending on the position of the mod wheel. Up to five Dimensions are available to an instrument, and can give great flexibility of expression during a performance.

Thankfully there are a variety of AVI tutorials on the CD-ROM to help you get started, since although the manual is thorough, it's a work of reference rather than bedside reading. Having explained everything in detail, Nemesys also make life far easier by introducing you to the Wizard Tool. This allows you to drag and drop multiple folders full of samples into the Wave Pool, and then tell the editor that there are (for instance) three velocity sets, a sustain pedal set, and a release pedal set, and that the note range is from A0 to C8. You then tell it which folder relates to which set, and a few seconds later the entire operation is finished, with the samples correctly mapped and pitch-stretched across the keyboard in the correct velocity layers.

Sample Wrench XE is a stand-alone WAV-based sample editor that provides basic but comprehensive editing support at WAV level; if you prefer, you can launch your own choice of editor such as *Sound Forge* or *Wavelab*. The *S-Converter* is launched automatically when importing Akai format CD-ROM sounds and can also be run as a stand-alone utility; this makes light work of converting an Akai program either to a set of WAV files, or to *Gigasampler* file format. The majority of the program information (such as filter and envelope settings) will be translated during the process.

In Use

After initially importing a smallish (50Mb) instrument to test things out, I made straight for the gigabyte piano. Any piano player who has played this will want a *Gigasampler* — it's as simple as that. The sound is rich, resonant and responsive, with each and every one of the 88 keys recorded in stereo, at three velocities, with pedal up and down versions (including soundboard resonance), and



there is not a loop in sight. When you hit a high note you can hear the sympathetic resonances from the rest of the instrument, especially if you hold down the sustain pedal as well. This is the closest to the real thing I have heard from a sampled instrument. Although it uses four voices per note (three velocities and sympathetic resonance), and requires a Pentium II, 64Mb RAM, and 650Mb hard disk space to operate, there is also a light version which only needs 32Mb RAM and 450Mb hard disk space. As you would expect, audio quality is solely dependent on your soundcard.

One of the most important factors with any software-based synth or sampler is the latency — however wonderful the sounds, it won't feel like a real instrument if there is an audible delay between pressing a note and hearing the sound. Thankfully, *Gigasampler* comes well up to scratch in this respect, with a typical latency value of about 5ms, depending on the soundcard: this doesn't alter even when all 64 possible notes are playing. This is achieved through the use of system RAM, which is the reason for the minimum 32Mb requirement. Although memory does not restrict the length of the samples used, it does limit the maximum number of samples — 32Mb will allow 216 mono samples (or 108 stereo), and 64Mb will manage 500 mono (250 stereo) and so on.

Practical Considerations

There should be no problems running *Gigasampler* alongside a MIDI sequencer — there is even a dedicated Seq. button to launch your chosen application. However, things get trickier if you intend to run a MIDI + Audio sequencer alongside. Apart from the fact that such a complex application as *Gigasampler* takes a large chunk of computer resources and memory, you are also likely to need two soundcards — one for sampling, and the other for hard disk recording and playback (unless you buy the Aark 20/20 card). Separate hard drives for each application wouldn't go amiss ►

S-Converter makes reading and importing Akai S1000 and S3000 format CD-ROM sounds a doddle.

What You Need

MINIMUM REQUIREMENTS:

- Pentium 166MHz MMX processor.
- 32Mb RAM.
- 2Gb hard drive space using any drive with <10mS access time (full performance only achieved with 9.5mS or faster, and a 512K cache).
- Soundcard with DirectSound drivers (or Giga-compatible drivers).
- Windows 95 or 98.
- MIDI interface.

RECOMMENDED SYSTEM:

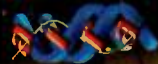
- Pentium II 266MHz processor.
- 128Mb RAM.
- 6Gb hard drive space on Ultra DMA, Ultra ATA, or Ultra/UltraWide SCSI drive.

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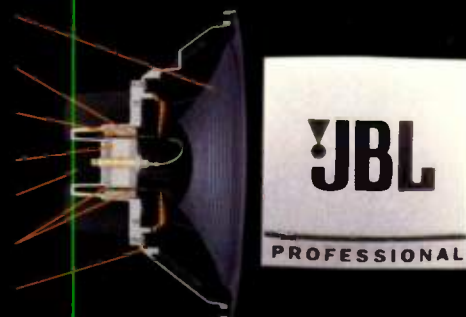
Dynamic Brake Coil

Neodymium Magnet

Aluminum Diecast Heatsink

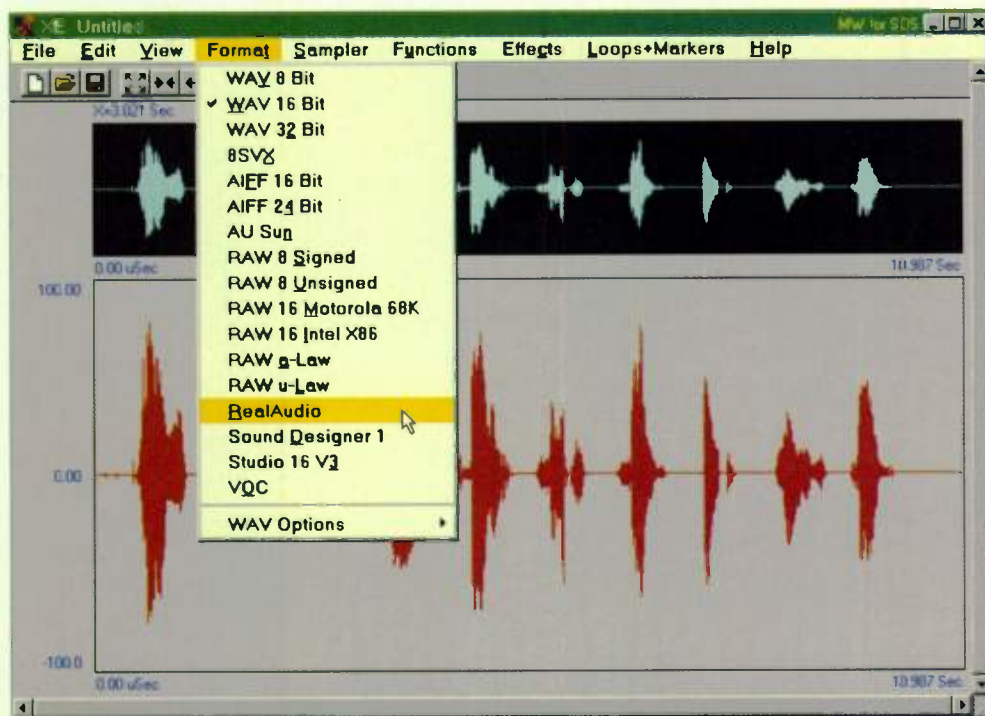
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NEMESYS GIGASAMPLER



Sample Wrench XE provides a comprehensive range of options for detailed editing at sample level.

► either, unless you are prepared to accept a lower number of notes and tracks when sharing a single drive between the two applications.

If you intend to run a MIDI + Audio sequencer at the same time as *Gigasampler* you will need a very powerful machine, and be prepared to accept compromises in both applications. In addition, to achieve the multi-output flexibility of a hardware sampler, you will again need a soundcard such as the Aark 20/20, which currently puts the price of the total package to something like £1500 on top of the computer system. Users are reporting successes with the latest versions of *Cakewalk* and *Logic Audio*, but *Cubase* is apparently causing some teething troubles with clicks and pops (this is not a fault of *Gigasampler*, but illustrates the possible problems). Users running *Gigasampler* by itself seem extremely pleased with it (apart from those who buy it blindly and find that their soundcards don't support it!).

As with Seer Systems' *Reality*, an Audio Capture facility is provided, which records the entire stereo output from a *Gigasampler* performance as a WAV file, which can then be imported into a hard disk recording system, and replayed as an additional stereo track. This is a useful facility if you decide that your machine simply isn't up to running *Gigasampler* and a MIDI + Audio sequencer at once. Another possibility would be to use a second PC solely running *Gigasampler*, when it would become much more like a stand-alone sampler, removing all possibility of software conflict.

Summary

If you need the ultimate multisampled sound that can be made only using extremely long samples,

using *Gigasampler* is probably the only way to do it — but unless you are prepared to undertake the large amount of work required to create such mammoth files, you will also have to budget for a *Gigasampler* library. East West have already created various pianos, including Steinway, Bosendorfer, and Fazioli models, where every note has been sampled separately, with up to eight stereo velocities per note — the largest is 2.2Gb. Other orchestral collections will also be available (including the *Gigasampler* version of the *Miroslav Vitous Symphony Orchestra* library). I can see this system being very attractive to film and TV composers who need the ultimate orchestral sounds. The current limit of 16 MIDI channels may be an obstacle here, although many more than 16 instruments can be loaded (subject to memory constraints), and program bank change commands used to switch between them. I suspect that many people will also use *Gigasampler* largely as a cost-effective soundcard-based sampler, using shorter sounds, or those from existing Akai-format libraries, and attempt to run it alongside their MIDI + Audio sequencer.

Gigasampler is a truly innovative piece of software that does exactly what it says on the box, providing a huge amount of sampling power for a relatively small outlay. It will be ideal for those who currently find it difficult to achieve realistic or evolving sounds using more traditional hardware sampling technology where the entire sound must be held in RAM. Nemesys are to be congratulated on a fine product that should certainly find its own niche in the marketplace, especially if a dedicated and comprehensive library of professional sounds is developed. **CS**

Protection Overkill

As you might expect, *Gigasampler* employs software protection, but while I fully recognise how important this is to the manufacturer, I am not very happy about the method adopted. Each package comes with a CD key number that needs to be entered during the installation. After rebooting, the first time you run the software it profiles your hard drives, and lets you select a suitable soundcard. However, once you finish this procedure, a screen appears explaining that you have a five day evaluation period. During this time, you must register your installation with Nemesys, either by email, fax, or phone, and then you will get a *Gigasampler* key number. One of these will be supplied 'per qualified CD Key and Registration number.'

I have come again this particular protection system only once before, and it also seems to place several innocuous looking files inside other random folders (I discovered one inside my *Wavelab* plug-ins folder for instance). Other tiny hidden files are also installed that will stop *Gigasampler* working if they are accidentally moved. You will be safe if defragmenting your drive with the standard Windows Defragmenter, but not with Norton Utilities (unless special precautions are taken). The worst of this protection method is that the Registration number is generated randomly when you install the software (I tried three times, and got a completely different number on each occasion) — if you ever have a major crash, or buy a new PC, you will need to persuade Nemesys to give you another Key number to install *Gigasampler* again. This is even worse than the dreaded hard disk install, which at least lets you move your install back on to floppy, and normally gives you two tries as well.

To give them their due, Nemesys emailed me my key number half an hour after they received my online details, and the web site does claim that they will give you a new number in case of accident, but this is still a worrying form of protection for professional musicians.

information

- E** *Gigasampler* £599;
Gigasampler LE £169;
Gigasampler LE + S-Converter
£269. Prices include VAT.
- T** Turnkey
+44 (0)171 419 9999.
- F** +44 (0)171 379 0093.
- E** sales@eastwestsounds.com
- E** sales@turnkey.demon.co.uk
- W** www.nemesystech.com

"I don't want to be sentimental about technology," reflects Daniel Miller. "I think it's a lot easier to make quite good music now than it was when I started out. But it's still as difficult to make *great* music as it ever was."

Unbelievably, Mute Records, the independent label Daniel founded and home to Depeche Mode,

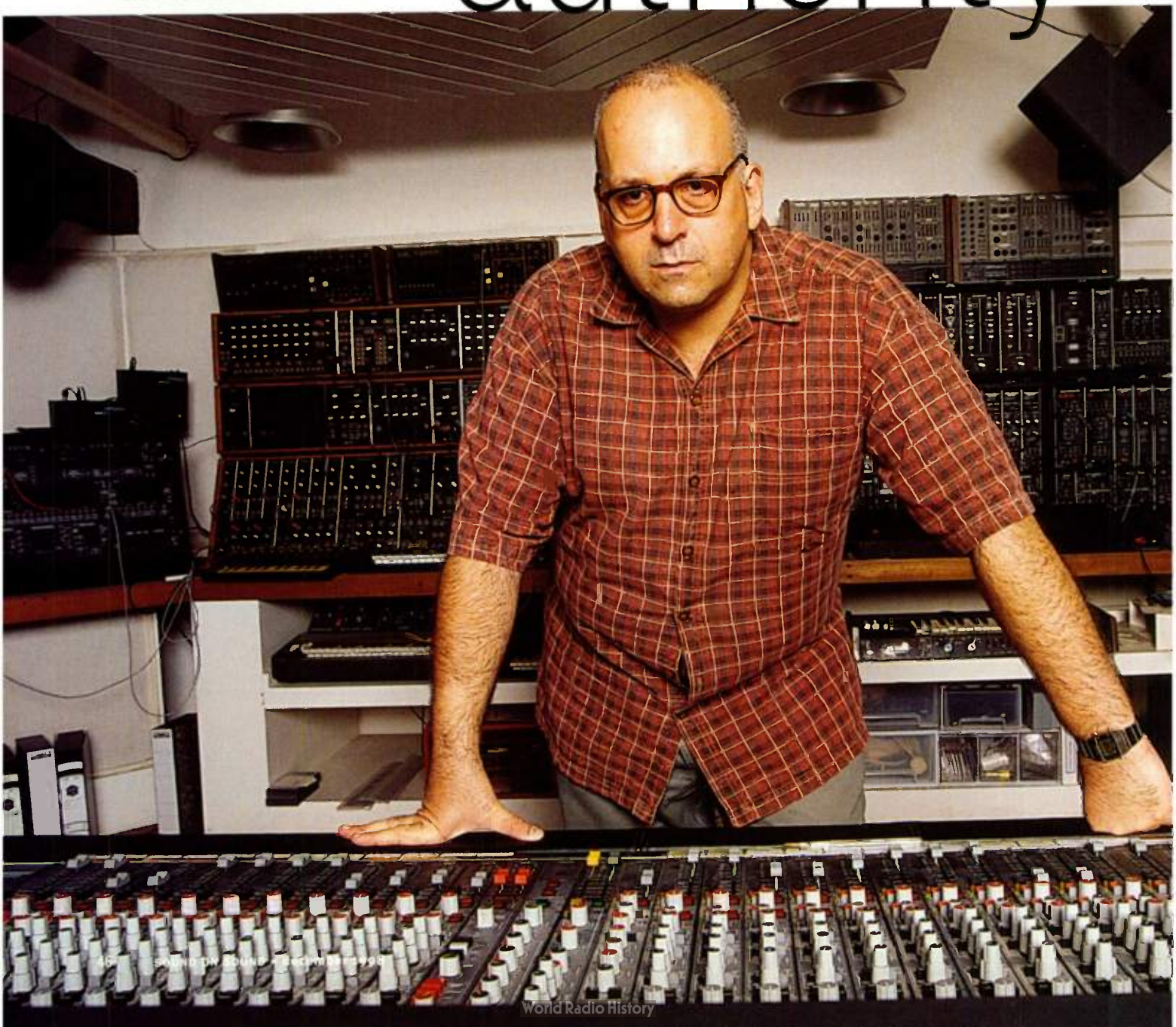
Erasure, Nick Cave and Moby amongst others, is 20 years old this year. Now one of the few genuinely independent UK record labels still in existence, Mute is far from gasping its last or selling out to a major label, like so many of its contemporaries, but continues to go from strength to strength. Mr Miller has a great deal to be proud of.

In the spirit of celebration, Daniel has invited



independent authority

**DANIEL MILLER & HIS HOME
STUDIO • MUTE RECORDS
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SOS into his rarely-seen home studio for a chat about the history of his company, and a look around the studio itself. This home facility developed in tandem with the rise of Mute and the construction of Mute's own studio (see 'The Instrument' box). Piece by piece, Daniel gathered together his own collection of classic vintage electronic equipment, of which more later in this article.

No Master Plan

Mute Records has come a long way since its formation in 1978, but Daniel is the first to admit that the success of the label was hardly the result of

Boss of the highly successful and determinedly independent Mute Records, Daniel Miller is one of the UK music industry's unsung stars.

Bill Bruce celebrates 20 years of Mute with

the man himself, looking back on such highlights as his work with Depeche Mode — and takes a rare tour of Miller's superb home studio.

any great master plan. In fact, it initially came about just so that he had an outlet for his own electronic material. As he admits, "I just wanted to do it on my own; I didn't think anyone at a record company would understand the music I was making."

The young Daniel Miller studied at film school and became a film editor after leaving college in 1971. Having always dabbled in music from school bands to DJing, he was inspired by the number of DIY records being produced in the wake of punk, coupled with the emergence of cheaper synth technology. "I always wanted to get into electronic music, so I worked as a film editor to make as much money as possible. I bought a little 4-track recorder, a Korg 700S synth, and a little mini-mixer, and that was it. When I became happy with what I was doing I decided to bring out a record. I was just going to do 500 7-inch singles, but then I went to the Rough Trade shop [legendary indie record label and distribution company] and they said they would distribute it for me. I didn't really know what that meant then, but they said I should press up 2000, and they all went fairly quickly."

In the guise of The Normal, Daniel released two landmark indie singles, 'T.V.O.D' and 'Warm Leatherette' (the latter inspired by JG Ballard's novel *Crash* and later covered by Grace Jones). Both featured skeletal, entirely synth-based instrumentation and minimal, almost chanted vocal accompaniment. These wholly electronic

Daniel Miller in his home studio.

beginnings meant that the label was initially viewed solely as a vehicle for synth experimentalists. Once again, however, this was not as the result of a conscious stylistic decision on Daniel's part — it was simply because he signed up artists whose work he liked, and electronic music was what he was into at the time. "Nearly all of the records I bought then were coming from Germany: bands like Faust, Can and Kraftwerk. I hardly bought an English or American record in those years. My real agenda was in finding acts who were unique; I didn't want to have a band who sounded like someone else."

Running the label from his home and releasing singles rather than albums, Daniel kept the nascent label's overheads relatively low, and both his releases and those by other artists he signed sold reasonably well. Indisputably, Mute benefited tremendously when interest in electronic music mushroomed at the turn of the '70s and '80s, and post-punk electronic experiments from the likes of Throbbing Gristle, Cabaret Voltaire and Robert Rental gave way to the more mainstream synth-pop successes of Soft Cell and The Human League, amongst others. Even after all these years, Daniel is ardent about the success of this music. "It was an historic inevitability," he attests. "There had been nothing like that before, and then there was this rash of singles which all seemed to come out at around the same time. They all came from a love of electronic music, cheap synths, and the inspiration of punk."

The real turning point for Mute came when Daniel signed Depeche Mode, a band initially viewed as an electronic version of the boy bands of the day, complete with neat, simple synth hooks and choirboy-like block vocal harmonies. Once again, however, Miller absolutely denies that the addition of Depeche Mode to the Mute stable represented any conscious effort at bandwagon-jumping on his part, insisting that the label became players in the electro-pop explosion of the early '80s almost by accident. But he admits the revolutionary effect the band had on his label, and the determination it instilled in him to provide in Mute the right environment for a hit singles band. "When Depeche started to break it took on another dimension. I had never had anything like a hit single, and this was the band being chased by every label in the country very soon after I started working with them. They were very young, and they had all these labels banging at their doors, so I felt a sense of responsibility to get it right for them. Also, all the majors said that Mute could never have hits, so I wanted to prove them wrong! It made me very focused."

Art 1, Commerce 1

Success can often cripple small labels, as they expand to meet the needs of their major act and then can't sustain themselves when that band falls out of fashion. Daniel clearly recognises this phenomenon: "One act like that changes the nature of a company; you have to catch up so you can service that artist. If you're smart, though, you can build up the company for the years when you can't



Bill Bruce

► expand your other acts.

"When we first had a hit with Depeche Mode we were still living hand to mouth. But I've got a shopkeeper mentality; when a lot of money came in, I put it to one side thinking it wouldn't last. I didn't go out straight away and sign loads of bands; it was important just to develop the artists I had. Besides, I ended up with two huge pop bands by default when Vince Clarke left Depeche Mode to form Yazoo, and after Yazoo came Erasure. But that was luck; after all, I didn't ask Vince to leave Depeche Mode."

Despite his self-effacing comments, there is no denying that the work Daniel put into Mute paid off, as not only did Depeche Mode become — and remain — enormously successful, but Mute grew with the band, ensuring that Depeche and its subsequent offshoots stayed with the label (see the 'Mute: Made For Mode' box). Furthermore, Daniel eventually *did* plough the enormous financial rewards of Depeche's success back into the company, carefully expanding the artist roster over time, and making Mute one of the few truly independent record labels still in existence which has successfully juggled commerce and art.

When this point is made, however, Daniel once again plays down his own business acumen, preferring to credit Mute's sound financial status to a dedicated and loyal staff: "We didn't have a financial person for ages and ages, but then as we got bigger, we got a guy who had been an accountant for Cadbury-Schweppes for years — which I liked, because I didn't trust music business accountants. When I asked him why he would want to leave such a secure job, he said, 'well, I love music and I want to be involved in it.' He's been with us ever since. I've never worked for a major label, so I'm not really in a position to judge, but I think that people get more emotionally involved with the work at Mute than they might do at somewhere like EMI."

The Way We Live Today

Throughout the '80s and into the '90s, Mute continued to grow in stature. While Vince Clarke's Erasure enjoyed a string of hits across Europe, Depeche Mode became one of the most successful British acts to conquer the United States. This tremendous upturn in the company's fortunes ensured that Mute was spared the subsequent fate



of several independent UK record labels, who have either collapsed altogether, like Manchester's Factory Records, or been at least partially bought out by major labels, like Alan McGee's Creation. Daniel confesses that times are tough for indie labels in the late '90s, but does not forecast a similar major buyout for his label, believing "it wouldn't be right for Mute". Despite the difficult climate, it's refreshing to find that Daniel still has a commitment to music designed for more than chart success, just as he had in the early days of Mute. However, he is always aware of the commercial and financial pressures involved. "When you start working with an artist you have to find out if they want to have hit records or not. And if not, obviously you do it a different way. You can't spend a lot in the studio, on a video, or on photo sessions if you want to make a record that is great but isn't going to sell a lot. Which is one of the reasons why we got our own studios in the first place — to make those kinds of records" (see 'The Instrument' box on page 54).

Despite this approach, as on every label, the boss has to make the difficult decision to drop an act at some time or other. At most major labels, profits and costs are the common determining factors, but at Mute, once again, Daniel's approach is a little different: "I have dropped bands, but not always for financial reasons," he admits, mentioning that he always takes several factors into account before swinging the axe. "One is financial, but another is artistic output. If a band is making great records but losing a bit of money, I'm not going to drop them. Another is the band's own willingness to succeed. There's nothing more frustrating than when a band makes a great record, but doesn't want to promote it or seem to want to succeed."

At Home With... Daniel Miller

Daniel has been itching to begin the guided tour of his home studio, and does so. He brims with the enthusiasm of a true devotee, even though these days he only makes music for himself, and not for commercial release. Clearly, the studio holds as many memories for him as pieces of classic equipment. "When I did my first single I was totally into Kraftwerk, and I just used this Korg 700S. I had no sequencers; it was all laid down by hand. The 700S is an amazing instrument, with brilliant sounds.

A shot of Daniel's impressive studio, containing the following gear (left to right, top to bottom): TAC Magnum mixer, EMS Synthi 100 modular synth (taking up much of the left wall), EMS Synthi AKS Suitcase synth (with optional blue keyboard on end on floor), ARP 2600 modular synth (in corner, with Roland MPU401 MIDI-CV converters hanging above it), (on right, from top) ARP analogue sequencers (x2), Moog Modular synth, EDP Wasp, Novation BassStation, (under desk) Moog Minimoog, Korg MS20, (between the Moog and Roland modulars) Technomage Life, (extreme right, from top) Roland System 100M modular, System 700, (on desk) Synton Syrinx, (just visible on right) Oberheim Xpander, (under desk) Korg 700S.

Left: The other wall of Daniel's home studio, with an amazing assortment of gear of all kinds, including (left to right, top to bottom): Latronic Notron, (in top left rack) Opcode Studio 4 (x2), Roland MKS80 with programmer, Waldorf Microwave, Akai S1000, Roland R8M, Novation BassStation rack, Korg 05R/W, Quasimidi 309, Peavey PC1600 MIDI Controller, (in next rack) Kawai K5m, Doepfer MAQ16/3, (in next rack) Akai S612, Studio Electronics Obie-Rack, (in last rack) Dbx 160XT (x2), TC Electronic Parametric EQ (x2), Fostex RDB, Alesis Quadraverb, Zoom 9050.



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World Radio History

► It's got two ring modulators, which is a bit bizarre, considering it was designed to sit on top of an organ and play little melodies, but I think synth manufacturers didn't really know what their market was then. The big Moogs were aimed at the experimental music market and the big ELP and Tangerine Dream types. The guys who came out with these first mini-synths, Korgs and Rolands... I guess they didn't know what their market was, so they built in all these extra little gadgets."

Keen to expand his synth arsenal, Daniel soon moved up in the world, buying an ARP 2600 modular synth with its optional analogue sequencer, which he uses (and enthuses about) to this day. Many dismiss analogue sequencers as primitive devices today, but Daniel leaps to their defence. "They certainly didn't seem primitive at the time; they were the highest of hi-tech, and the ARP stayed my main sequencer for years. It only had 16 note steps, but was a tremendously creative tool. I remember the first time I showed it to Vince Clarke; he was mesmerised by it, and so the ARP became crucial to the early development of Depeche Mode. In the end, though, I was desperate to get something MIDI, because the control voltages from the ARP are very unstable, and you could never get a CV-to-MIDI converter that worked properly. Now I have these two analogue-style MIDI sequencers, the Doepfer MAQ16/3 and the Latronic Notron. I waited years for someone to make a MIDI sequencer that was like an analogue one to use, and Doepfer finally did! It's great for recording straight onto the computer and manipulating later."

This last comment provides an insight into the way Daniel uses the studio today; he favours coming up with ideas via the knobular interfaces of the ARP, Notron and Doepfer, and then puts these ideas into his Apple Mac to edit. He sees this approach as a combination of the best of what analogue and digital have to offer, as he finds an all-digital synth and sequencer setup actively counter-creative at the earliest stage of the writing process. "There is definitely a problem with MIDI; it gives you too many options. MIDI instruments and sequencers are infinitely tweakable, and you don't commit yourself to basic ideas. I've got away from having so much gear and gone back to a couple of bits of gear I really love; there are plenty of people doing that nowadays. So even though you might have 32 tracks of computer-based audio recording, you've only got two monophonic synths to commit to when you write."

If this seems like a step backwards, Daniel disagrees. "You can't go backwards by limiting yourself. You're just focusing on the stuff you really use and getting the best out of what you have."

One Mute label resident certainly agrees. Vince Clarke ditched all of his MIDI sequencers in the early '90s, and has written all of the Erasure albums from 1991's *Chorus* onwards on a Roland MC4 analogue sequencer. Strangely, despite his aforementioned love of old sequencers, Daniel is not an MC4 fan. "I personally hate the MC4, but Vince loves it; he thinks it keeps great time. I think you can get too focused on things like timing. Vince knows his MC4

Daniel's Home Studio

SYNTHS

- EMS Synthi AKS suitcase synth. "It's really handy to have a hard disk recording facility with some of these old analogue synths, like this one, because the synths don't have memories and sometimes you'll never get a killer sound back a second time. It's great to twiddle away for hours onto the hard disk and then cut and paste the parts and make up loops."

- ARP 2600. "This was used on every Depeche Mode record I worked on."

- EDP Wasp. "The Wasp is really important because for a certain generation it was the first really affordable synth."

- EMS Synthi 100. "This is one of those instruments that you would drool over in synth history books. Only about 50 were ever made. This one was part of the electronic music studio at the University Of East Anglia and they weren't asking very much for it, relatively speaking. Lately, I've been doing some remixes and it's appeared on those."

- Kawai K5m.
- Korg 700S.
- Korg MS20.
- Korg 05R/W. "This is my one concession to multitimbral sound modules. It's a good sketch tool."

- Moog Minimoog.
- Novation BassStation.
- Novation BassStation rack.
- Oberheim Xpander.
- Synton Syrinx. "This is a brilliant monophonic synth — in fact one of the last monosynths — from the early '80s. It isn't a modular synth but I find it very flexible. It has three different independent filters which make it sound like nothing else."

- Quasimidi Rave-O-Lution 309. "Great name, great sound, and great real-time control. Gareth Jones (producer and remix partner) and I did an entire remix just using this and a little Yamaha SU10 sampler on his kitchen table, direct to DAT."

- Roland MKS80 Super Jupiter.
- Roland System 700 & System 100M modular synths. "It took about five years for me to track the 100M down. These were partly bought as collector's items, although the 700 was used to treat some loops on the last Depeche Mode album *Ultra*."

- RSF Kobol.
- Studio Electronics Obie-Rack. "This is effectively two Oberheim SEMs in a rack, with MIDI, and was a gift from



The obscure but fun 'wooden grapefruit' Technomage Life MIDI controller is visible on the left of this shot of Daniel's home studio. Also in shot: his Roland System 100M and 700 modular synths, Synton Syrinx, Oberheim Xpander, and his first ever synth, the Korg 700S.

producer/remixer François Kervorkian. He was raving about these when he worked on the last Erasure album and he said if he ever came across one of these he'd get it for me. It's got some really good sounds."

- Waldorf Microwave.

RECORDING

- Alesis Quadraverb multi-effects.
- ATC 100 monitors.
- Celestion monitors.
- Dbx 160XT compressors.
- Dbx gates.
- Fostex RD8 ADAT.
- Lexicon LXP15 multi-effects.
- Lexicon LXP15 MkII multi-effects.
- TAC Magnum 24-channel mixing desk.
- Tannoy monitors.
- TC Electronic TC2240 parametric EQ.
- Zoom 9030 multi-effects.

SAMPLERS

- Akai S612.
- Akai S1000.
- Boss SP202 Dr Sample.
- Yamaha SU10.

DRUM MACHINES

- Roland R8M Drum Module.
- Roland TR909.

HARDWARE SEQUENCERS

- Latronic Notron.
- ARP analogue sequencer (x2).
- Doepfer MAQ16/3.
- Roland MPU101 MIDI-CV converter (x3).

COMPUTERS & SOFTWARE

- Apple Macintosh A600.
- Bitheadz *Retro AS1* software synth.
- Koblo *Vibra 9000* software synth.
- Opcode *Vision* sequencer.
- Steinberg *Propellorheads Rebirth* software synth.

MISCELLANEOUS

- Kenton Pro4 MIDI-CV interface.
- Opcode Studio 4 interfaces.
- Peavey PC1600 hardware MIDI controller. "This is very handy for controlling my software synths."

so well he can just sit there for five minutes, banging away at it and you won't hear a note. Then he'll press play and a whole tune will pour out of it. He's got an instinct for it. I'm not nearly as much of an analogue purist as Vince is. I just like machines that are good fun and easy to use." ►

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► Unsurprisingly, given this last remark, Daniel is not a fan of digital synths, such as those which followed the success of the DX7 in 1983, as he feels that they were not just less easy to use but also contrary to the original spirit of synths in general.

"To me a DX7 isn't a synth, it's more like an organ; just a keyboard instrument. I think a synthesizer isn't primarily a keyboard instrument — it's a sound-generating instrument. One of the ways you happen to be able to use it is from a keyboard, but I've always been into different types of controllers. The designers of those digital systems were trying to fit too much into one box, and so the synths weren't much fun to use. If you wanted to get strings, brass and drums out of one instrument they were great, but none of our artists were particularly keen on that kind of stuff. It was all catering to keyboard playing... velocity sensitivity and all of that. The way you put expression into an analogue synthesizer isn't to do with how hard you hit a key, it's how you create a sound and manipulate it in real time; moving filters and envelopes as it's going. That's why everyone's so knob-crazy now,

which I think is great; the last few years have seen some really good things come out. One thing I use a lot these days is the Quasimidi Rave-O-Lution 309. It's got great sounds and memory facilities, and it's very programmable — it's just very enjoyable to use, which is how instruments ought to be."

As well as synth technology, Daniel and other Mute artists actively embraced sampling technology in the early '80s (Vince Clarke was one of the first pop artists to purchase a Fairlight, as Daniel points out). But in these days of relatively inexpensive digital and hard-disk recording does he still feel that instruments like the Synclavier and Fairlight were worth the tens of thousands of pounds they cost at the time?

"In a sense they were. The Synclavier itself was slightly erratic and difficult to use but it opened a door to a world of sound that nothing else came close to — and we were able to make big hit records which we couldn't have made without it," he admits matter-of-factly.

An Influential Player

The legacy of these pioneering Mute singles can be heard in much modern

Mute: Made For Mode

In collaboration with both Depeche Mode and Vince Clarke in all his various projects, Daniel has aided the production some of the most striking records of the last 20 years, from Yazoo's 'Only You' which fused blues with electronics, through to the multisampling and 'found sound' of Depeche Mode's 'People Are People'. He looks back on the band's achievements with pride — especially given the restrictions of the technology available at the time. "I think they set up a completely new playing field," he says. "I think there were very few people doing stuff like them.

"When I first worked with them, they'd never been in a studio before," he remembers, adding wryly, "To be honest, at that time I'd hardly worked in one either! I felt like I was a really experienced producer compared to them, but I wasn't really. I think I did help them get the sounds they needed with the very small range of technology at our disposal. I was trying to show them the possibilities open to them.

"The very first time we went into the studio was to do a track called 'Photographic' for a sampler album. A different version of that later ended up on their first album [1981's *Speak and Spell*]. I had my ARP sequencer sync'd to tape and Vince just couldn't believe it. They immediately got into it. In terms of structure and arrangement I left their ideas alone, because I thought the songs were great and wanted them to go down as faithfully as possible.

Following *Speak and Spell*, Vince Clarke, hitherto Depeche Mode's main songwriter, left the band, eventually forming Yazoo with Alison Moyet. At this stage in Mute's history, this development might well have spelt the end not

just for Depeche Mode but for Mute itself. But Daniel didn't panic. In the time between Clarke leaving and his replacement, Alan Wilder, joining a year later, Daniel became an unofficial fourth member of the group. "I just thought, 'well, let's get on with the next record'. I knew Martin [Gore, Depeche's future songwriter] could write songs. However, it did get very different when Vince left. He had been the driving force behind the band; he got them together to rehearse and went around with demo tapes. So I was more concerned about keeping the band motivated, because I knew Martin had the songs — although even I was surprised at the massive leap in his songwriting from the *Broken Frame* album to *Construction Time Again* and songs like 'Everything Counts'.

"Vince always had a clear idea of how songs were going to be, whereas Martin's songs were presented in *incredibly* raw form; usually just a Casio, a voice and a foot tap! None of us had a particularly solid idea of how those songs would end up. We were building more from scratch. So I started to have much more input into sounds and arrangements. I was trying to be original all the time.

"The first two Depeche Mode albums were all done with analogue gear, although by the time we got to *A Broken Frame* [the second album, 1982] we did have a TR808 drum machine. We used it for a few things but not for the whole kit, because we were really into using drum sounds we made on synths. We'd make our own bass drums and snares because we didn't want to sound like everybody else. We also didn't use things like the LinnDrum for the same reason; it was full of good quality sounds, but it robbed you of your identity. I suppose we were working to our own ideology."



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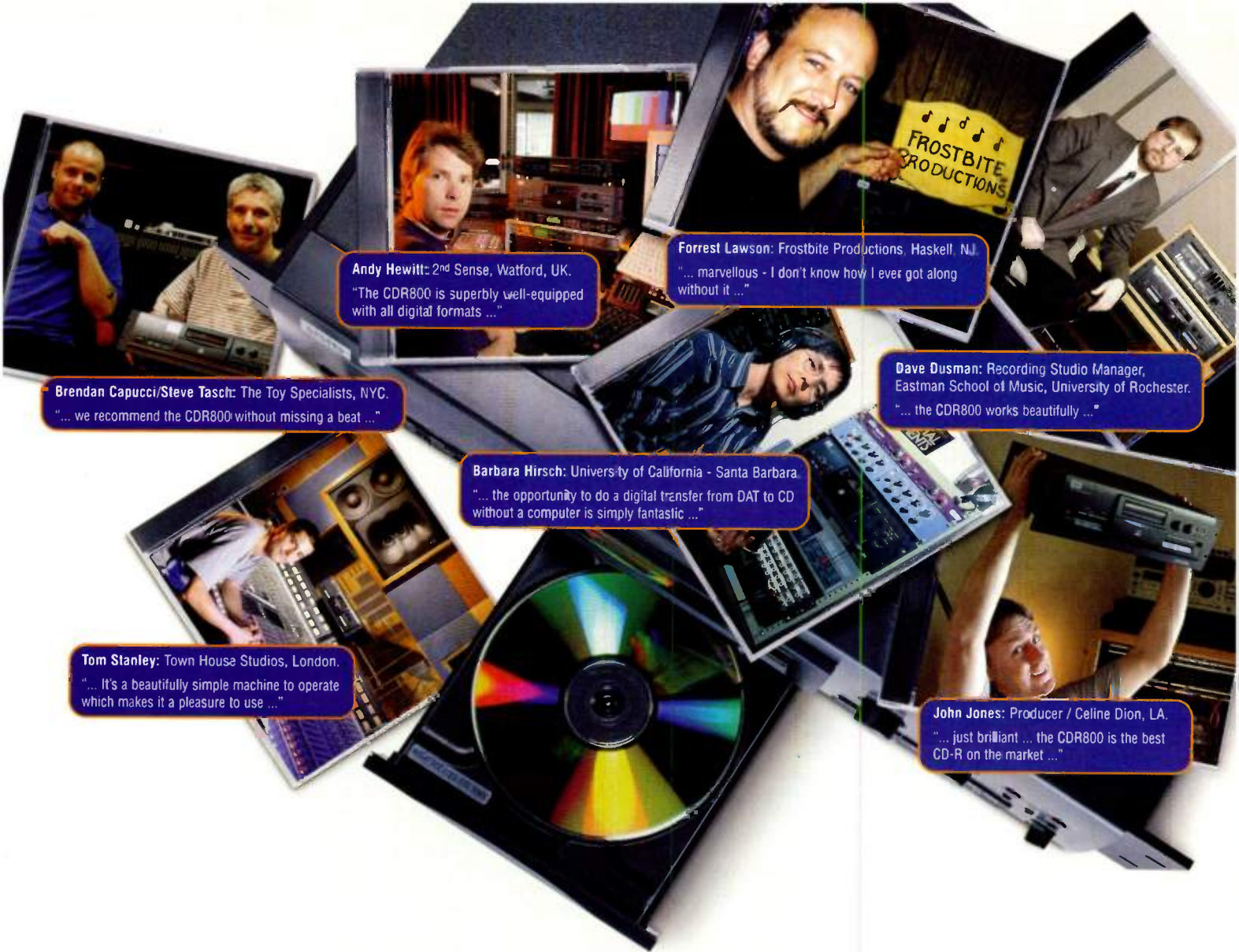
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The Instrument – Selected Gear List

The Instrument is the new name of Mute's in-house recording studio. It has been home to everyone from Depeche Mode (who recorded parts of several of their earlier albums there, and still use it as a pre-production facility) and Nick Cave to Renegade Soundwave and Nitzer Ebb. Previously, the studio has only been available to Mute artists, but it is now opening its doors to the public. Situated in North Kensington, London, The Instrument comprises a large main studio, a small but cosy pre-production suite and an audio post-production facility. Many of Mute's own fine collection of vintage synths (see extensive list below) are available to clients on request, often at no extra charge.

INSTRUMENT 1

SYNTHS/KEYBOARDS

- EMS Vocoder.
- Korg DRV3000.
- Korg Wavestation.
- Novation BassStation.
- Roland JV1080 (with Vintage voice card).

SAMPLERS

- Akai S1100 (with 10Mb of RAM).
- Emu E6400 (with 64Mb of RAM, 16-out output expansion and digital I/O expansion boards).

RECORDING

- Alesis ADAT (x2).
- Alesis Quadraverb multi-effects.
- Amek Hendrix 56-channel mixing desk.
- ATC200 monitors.
- Brüel & Kjær 4006 mic.

- Dbx 120x bass enhancer.
- Drawmer DS201 dual gate (x4).
- Dynaudio BM15 monitors.
- Eventide H3000 & H3000SE pitch-shifter/multi-effects.
- Focusrite dynamics processors (x2).
- Joe Meek compressor.
- Korg DRV3000 multi-effects.
- Lexicon 300 reverb.
- Lexicon PCM70 reverb.
- Lexicon PCM80 reverb.
- Mutronics Mutator filter bank.
- MXR pitch-shifter.
- Neumann U87 mic.
- Otari DTR7 DAT machine.
- Otari MTR12 half-inch stereo tape recorder.
- Otari MTR90 2-inch 24-track.
- Panasonic SV3800 DAT machine.
- Rode NT2 mic (x2).
- Roland SDE330 multi-effects.
- Roland SRV2000 multi-effects.
- Shure SM58 mic.
- Summit tube dual preamp.
- Symetrix Noise Reduction.
- TC Electronic Finalizer mastering compressor.
- TC Electronic parametric EQ.
- TC Electronic TC2290 delay.
- Valley People 610 compressor.
- Yamaha NS10M monitors.
- Yamaha SPX90 multi-effects.

COMPUTERS & SOFTWARE

- Apple Mac Quadra 610.
- Atari 1040ST.
- C-Lab Notator.
- Steinberg Cubase.
- Steinberg Recycle.

MISCELLANEOUS

- Syquest drive (44Mb).
- Iomega Zip drive.
- Kenton Pro2 2-channel MIDI-CV converter.
- Novation DrumStation.

INSTRUMENT 2

SYNTHS/KEYBOARDS

- Moog Minimoog.
- Moog Prodigy.
- Novation BassStation rack.
- Oberhelm Xpander.
- Oberhelm Matrix 6R.

- Oberhelm Matrix 1000.
- Roland JV1080 (with Vintage voice card).
- Roland PC200 MIDI keyboard.
- Roland TB303 Bassline.
- RSF Kobol.
- Yamaha DX7II.
- Yamaha SY35.

SAMPLERS

- Akai S1000 with 10Mb of RAM (x2).
- Lexicon Jam Man loop recorder.

RECORDING

- Alesis 3630 stereo compressor.
- Alesis ADAT digital multitrack (x2).
- Altec 436b compressor.
- Amek EQ (x4).
- Amek Einstein 60-channel mixing console.
- BSS DPR402 stereo compressor.
- Crane Song STC8 compressor.
- Drawmer DL221 compressor.
- Drawmer DS404 noise gates (x4).
- Dynaudio M2 monitors.
- Eventide H3000 pitch-shifter/multi-effects.
- Neve 33135 mic preamp/EQ (x2).
- Panasonic SV3800 DAT machine.
- Roland SDE3000 multi-effects.
- Studer A80 MkIII tape machine.
- TL Audio 4-channel signal processor.
- TL Audio EQ2 valve parametric EQ.
- Yamaha NS10M monitors.
- Yamaha REV7 multi-effects.
- Yamaha SPX990 multi-effects.

COMPUTERS & SOFTWARE

- Apple Mac Quadra 610.
- Atari 1040ST.
- C-Lab Notator.
- Steinberg Cubase.
- Steinberg Recycle.

DRUM MACHINES

- Novation DrumStation
- Roland TR808 drum machine

MISCELLANEOUS

- Kenton Pro2 MIDI-CV converter

POST-PRODUCTION SUITE

COMPUTERS & SOFTWARE

- Apple Mac 9600/350MHz (with



The programming station in Instrument Studio 1: Apple Mac Quadra 610, Emu E6400 and Akai S1100 samplers, Roland JV1080 synth, (next rack) Novation BassStation and DrumStation racks, patchbays, and an Apple PowerMac 7100.



An impressive array of vintage gear in Instrument Studio 2: (on left of shot) Moog Minimoog, (on top rack) Oberhelm Xpander, Roland TR808 Rhythm Composer, Moog Prodigy synth, Vox organ.

- 64Mb RAM
- 2Gb internal hard drive & Iomega Zip drive).
- Digidesign DPP1 Digital Pitch Processor.
- Digidesign DVerb Delay.
- Digidesign Pro Tools 24 (v4.1.1 software).
- Focusrite D2 EQ plug-in.
- Focusrite D3 Compressor.
- Waves compression, EQ, and limiter plug-ins.

RECORDING

- Cambridge Audio CD player.
- Denon Cassette deck.
- Dynaudio BM15 monitors.
- Panasonic SV3800 DAT Machine.
- MOTU MTP AV SMPTE/MIDI synchroniser.

MISCELLANEOUS

- CD-R burner.
- External 9Gb, 4Gb and 1Gb AV hard drives.
- Iomega Jaz drive.
- Technics SL1210 record decks (x2).
- Vestax 05 DJ Mixer.



► music. For once Daniel is not backward in coming forward. "I think the likes of DJ Shadow and all the Detroit techno guys were hugely influenced by our early records, although it is hard for me to say that, because I was involved so closely with them. Mind you, I have met quite a few techno producers who say that the first thing they programmed into their first little Casio keyboards was the riff from Depeche Mode's 'Just Can't Get Enough'. It's great when you find out the person who made a record you like was really influenced by a record you were involved in. I suppose everyone wants to feel they're helping to move music forward."

Mute has been the biggest thing in Daniel Miller's life for the past 20 years, making you wonder if he thinks having a life away from the record label is equally important: "I think it is important to do that," he laughs, "but I don't! I don't have a family, and I don't have any major hobbies outside of music. If you're running an indie label, it is very hard to switch off."

It's pretty obvious that Daniel Miller is in the music business for the full nine yards. At the end of our interview, he responds to a question about his attitude to retirement with a firm reply. "It depends when I drop," he smiles. **SCS**

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* Filter Sweep, Reverb, Wah Wah, Flange, Envelope Follower, Distortion, Delay, Time Stretch, Low Pass, Mid Pass, Band Pass, High Pass, Auto Pan, Pitch Shift, Multi-Trigger

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- Record .wav files
- Link to sound editor
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ALSO AVAILABLE:

Studio Pro's little brother is called Mixman Studio. At only £29.99, it incorporates the same patented real-time remix architecture as Mixman Studio Pro, but without the FX and Editing Studios. Winner of the Keyboard Magazine "KeyBuy" award, Mixman Studio enables anyone with the passion for music to interact, customize, control and perform, at a level that will amaze anyone. The powerfully simple user interface makes Mixman Studio™ the best choice for remixing on a budget.

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Studio pro

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Auto beat-matching of incoming sounds	YES	YES
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Export to REAL AUDIO® and SOUNDFONTS®	YES	NO
Import and Export Wave Files (.wav)	YES	YES

SYSTEM REQUIREMENTS: • Windows 95/98 • Pentium 133 or faster • 32 MB RAM (64 MB or more RAM recommended) • DirectX Compatible Sound & Video cards • Monitor (256 color mode recommended) • DirectX 5.0 (or later) fully installed • 25 MB Available Hard Drive Space (225 MB to install with audio) • CD-ROM Drive (protected-mode driver support).

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• Supported by the Internationally acclaimed Mixman SOUNDISC™ series - a huge library of new sounds created by MAJOR recording artists & producers or leading sample CD developers. At least 13 titles available by Christmas including George Clinton, Skinny Puppy, K-Klass, Heaven 17, Love to Infinity, DJ Dougal, DJ Bōsk, and many more coming...

• Major record labels (e.g. Warner, Tommy Boy, Capitol) are releasing albums enhanced with Mixman software & including .TRK files - for example check out "Sly-Fi", the new album by (Eurythmics) Dave Stewart.

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novation

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QSR - £475

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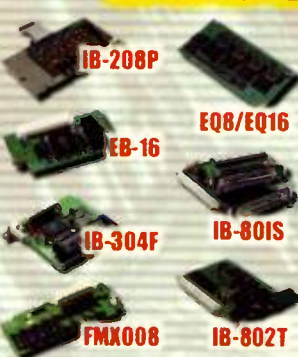
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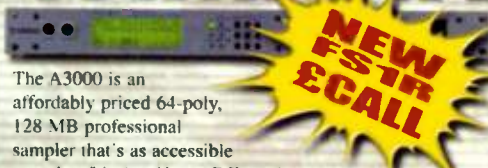
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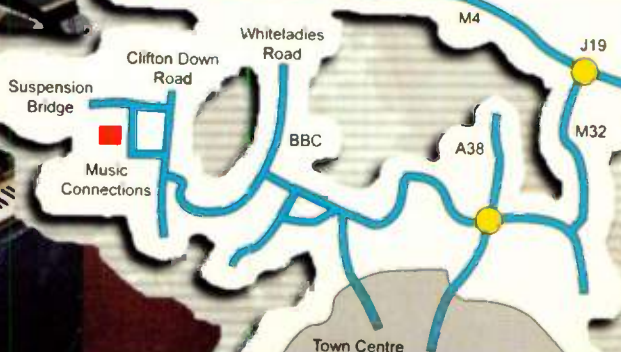


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Great Deals are available on all EMU equipment, if you would like an example just check out the price on the Darwin Hard Disk Recorder on page 8. Even better look at the amazing deals on the Orbit and Planet Phatt and the unheard of deal on the new Audity 2000, pictured opposite.



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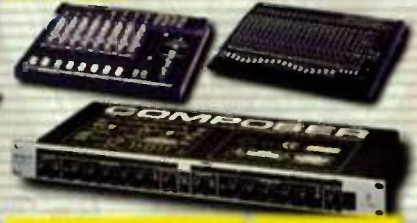
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TANNOY
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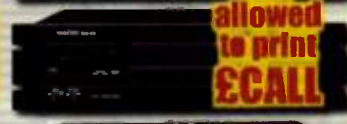
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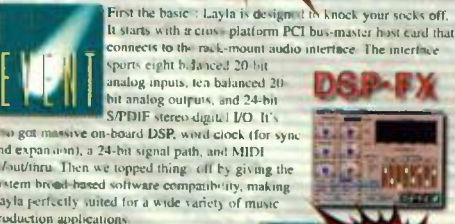
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Cubase VST

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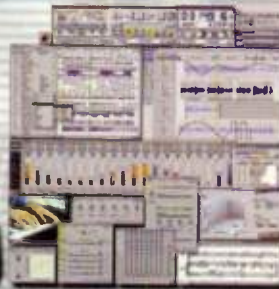
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re:sampling

Sampling has become such an integral part of recording and remixing music that it's sometimes difficult to appreciate how the first digital samplers to hit the kind of streets where ordinary folk tread were regarded with as much suspicion as they were curiosity and awe.

Unlike synthesizers and sound modules, which were ready to make music straight out of the box, samplers were regarded as potentially bad value for money — being nothing more than empty boxes which you had to put sounds into before you could get anything out. And while it was true that most samplers came with a small collection of factory disks, in terms of numbers, these hardly compared favourably to the scores of preset sounds to be found on the average synth. Hence, early samplers would be seen, professional Walkmans in hand, rushing around recording everything from major industrial accidents to duck farts just to 'fill' their samplers with some sort of sound.

Nowadays, of course, the plethora of sample CDs, plus other sources like magazine cover CDs and the Internet, mean that you can access millions of pre-recorded sounds, riffs, loops and sonic textures without ever needing to leave the comfort of your studio chair. For that reason, it's easy to overlook the basic fact that the whole point of samplers is that they *are* empty boxes, into which you can record absolutely anything you want. More to the point, it's also easy to overlook the fact that DIY sampling usually offers a much quicker (not to mention cheaper) route to getting the sound you want than trawling through hours of sample CDs. As a simple example, I was recently looking for a sample of an old country blues vocal to loop under a middle eight section of a song. After spending hours scouring record shops for something that might be appropriate, I realised it would be a simple matter to do my own Howlin' Wolf impression, pitch it down a few semitones, pass it through a EQ to simulate the narrow bandwidth of an old vinyl recording and then add in some vinyl crackle.

In the interests of promoting the DIY approach to sampling, the first part of this two part series simply looks at a few 'found' sound sources for the

CREATIVE SAMPLING: PART 1

trigger-happy samplist. It's not exhaustive by any means, but it's intended to stretch the thinking beyond the usual 'ready-made' solutions.

Speak Your Mind

- The human voice is the most expressive instrument at your disposal, so don't be afraid to use it. Legend has it that when a well-known, but now-defunct manufacturer of electronic drums was launching a new product, a technical hitch prevented them from demonstrating the product directly. So some bright spark stepped up to a microphone and did vocal impressions of what the new equipment *should* have sounded like. It's probably an apocryphal story, but the point is, if you know what sound you want, why not vocalise it? Those erstwhile crooners, the Mills Brothers — originally subtitled 'Four boys and a kazoo' — built a successful international career on close harmony coupled with vocalisations of big band instruments which they were initially forced to perform when they lost the kazoo. Yes, really.

Bottle Of The Little Big Noise

Some noises which are insignificant in real life can sound huge when pitched down and turned up.

- An obscure electronic modern opera, which I once handed over good money to see, made much use of what sounded like the door to a cavernous medieval torture chamber creaking shut. This

These days, samplers are the electronic musician's bread and butter — but they need not be used in commonplace ways. In the first part of a short series, **Nicholas Rowland** looks at ways to spice up your tracks with samples from unusual sources.

Sampling Tips 1: Is DAT A Gun In Your Pocket?

If you want to become a truly dedicated collector of weird noises, don't leave home without some sort of recording device. The truly wired (and wealthy) will no doubt want to keep a portable DAT or Minidisc recorder tucked down their trouser leg.

However, you can get perfectly respectable results using an inexpensive tape-based dictation machine, even with the built-in mic. You can always 'fix' your recordings to a

certain extent when you get back to the studio — for example, turn down the treble EQ to get rid of tape hiss, or load the sounds into your sampler or hard disk recorder and 'normalise' them to increase volume without distortion. But as it's often the imperfections in the samples which make them interesting, particularly when you start to transpose them or loop them, you don't need to worry unduly about sound quality.

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▶ earthshaking and somewhat macabre noise was, in fact, a sample of the squeaky handle of the composer's flightcase.

- Big sheets of paper being shaken or flicked from behind can be turned into thunderous noises by pitching down, turning up and routing through big reverbs. This is a variation on the old theatrical thunderboard, more famously reincarnated as the Rolf Harris wobbleboard. Try also tin foil, baking trays, flapping pillowcases and flicked wet teatowels.

- Metal garage doors are also good for thunderous noises. Persuade some local kids to practise their goal-scoring skills while you stand around with a tape recorder (but be prepared to leg it if the garage is not your own).

- Blown bottles are a bit passé these days (see the box on clichés on page 68) but, pitched down, can create some superb foghorn sounds.

Percussive textures

- Doors slamming, popping paper bags and crisp packets, drawers full of cutlery, dustbins and most components of a domestic central heating system are all you need to produce a wealth of industrial or junk percussion sounds — techno weirdsters Spooky based their entire *Found Sound* album around samples of radiators in their houses, if memory serves. And they were on to a good thing, as generally speaking, metal objects tend to sound more interesting than wooden ones when pitched down, because lowering the pitch brings out lots of gorgeous undertones. Try also capturing the sound of a squash ball hitting a court wall for an instant gated snare substitute — Todd Terry (the producer who resurrected Everything But The Girl's career with his remix of 'Missing') used a sample of a golf ball bounced around a narrow alleyway out the back of his studio as his staple snare sound for quite a while. Oh, and I'm sure I read somewhere about an album being recorded largely from samples of plant pots struck in various ways which, when treated accordingly, sounded like spooky ethnic drums. And let's not forget the fabulously splashy, distorted open hi-hats that graced S-Express' number one hit 'Theme from S-Express'. They were hissy for a reason — they were actually samples of aerosol deodorants.

- If you have kids, then raid their toy cupboards for anything that makes a weird sound. Old electronic or mechanical toys often yield some interesting results — U2 used a theme sampled from a music box at the start of track 2 on their *Zooropa* album, 'Babyface', for example (though whether the musical results are as interesting as the story behind them is a matter of taste).

The Sound Of One Hand Clapping

- Of course, you're not always going to be looking for pitched sounds, melodic phrases or rhythmic racket which can be played or sequenced into your compositions (after all, the attraction of playing Mozart concerti in dog woofs or trimphone rings, much beloved of early sampler demonstrators,



Left: It may look like just another piece of hi-tech gear, but it'll put more strange sounds into your mix than the largest modular synth...



Above: No self-respecting sample collector should leave their house without a highly portable audio recorder, such as this tiny MD Walkman, about their person.

palled fairly quickly — ie. by about 1982). Some samples are unmusical, but highly effective in a track as 'ear candy', such as snatches of famous quotes from films, or weird room ambiances sampled from the Buddhist temple you visited on holiday. The artist Scanner has made a career out of this kind of thing; he is notorious for building tracks around snatches of mobile phone conversations. Another technique I've come across for gathering such material (though you have to live in the right place for it to be effective) involves simply hanging a microphone out of the window around pub chucking-out time. Plenty of 'ambience' to be had there, I suspect. Other sources of ambient sounds are trains and railway stations — particularly any large terminus with a huge glass roof and a vast tiled floor — and any place with big machinery such as car-crushing scrapyards, real-life factories, fairgrounds and building sites. Much of the metallic racket on Depeche Mode's *Construction Time Again* album came from extended periods lurking around Brick Lane British Rail depot and various London scrapyards looking for industrial cacophony to sample, apparently. Or perhaps the members of the 'Mode were just making up an musical excuse to explain away their trainpotting activities...

Radio Daze

- Even before sampling became a technique for the masses, a tried and trusted approach among early experimenters in electronics was to get hold of a shortwave radio and then rotate the dial between stations while recording the resultant noises to tape. And what noises they were! Clicks, pops, buzzes, fizzes, static and general interference, along with obscure Ukrainian Communist broadcasts and (if you were really lucky) SOS messages from distressed nuclear subs sinking in

Sampling Tips 2: And... Stretch! (Or, Indeed, Compress)

To work out the stretch/compression ratio so one rhythmic sample loop fits the tempo of another, take your target tempo in bpm (beats per minute) and divide it by the tempo of the loop you are stretching. Certain samplers will offer different levels of sophistication in how they timestretch samples. On the 'crude' settings you can get some interesting distortion effects, particularly when dealing with larger stretch/compression values. As always, it's worth experimenting.

If you want to time-stretch or compress a

sound so that it will stay the same length but play at a different pitch you need to get out your scientific calculator. First take the pitch difference you're aiming for in semitones, then divide it by 12. Press 2 on your calculator followed by the x^y button, then the number you just came up with. This will give you the necessary compression value (if you want the pitch lower) or stretch value (if you want the pitch higher). Time-stretch or -compress the sample with this value, then play at the required new pitch. You should find it's the same length it was originally.

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► the Pacific. From this process came a lifetime's collection of percussive and ambient samples and 'atmospheres' of various political persuasions — some random examples on record include: the Orb ('Little Fluffy Clouds'), KLF (much of the *Chill Out* album), The Shamen ('Jesus Loves America'), The Grid ('Are You Receiving?')... oh, pretty much anyone with a sampler and access to a radio, really.

My feeling is that this technique is due for a revival, though a modern twist on this approach makes use of the auto-tuning on present day radios — ie. that function which scans the airwaves and then locks on to the next strongest signal. Often when idly scanning between stations on long boring car journeys, I momentarily tune in to odd snatches of conversation or bursts of noise which sound like instant sample classics. Even common or garden words, taken completely out of context, can take on a near-mystical quality — especially if they happen to come from those regular Radio 4 discussions on the history of whaling in the 19th century.

Is This An Akai I See Before Me?

▪ Less obvious, but often rich sources of obscure phrases are story tapes, recorded plays and poetry readings — of which many and various are usually available from your local library. A friend of mine used to have great fun with an old vinyl recording of famous soliloquies from Shakespeare, delivered in those rounded tones which are peculiar to English actors whenever they do the Bard. Admittedly, you might have difficulty building an Ibiza-shaking classic around "My kingdom for a horse" or "Hey nonny the roistered cuckolds" but hey, just because it hasn't been done before... In fact, my friend's trick technique was to chop out individual syllables and use the resulting recognisable but incomprehensible speech to add colour to rhythm loops, to much more interesting effect than the usual 'Yeah', 'Hey' and 'Pump, motherf**cker' that seem to be the staple diet of many modern sample CDs.

Sound Affects

▪ Consider the BBC sound effects records that were the staple of every parish hall amateur dramatic production of *Don't Look Now But I Think The Vicar's Here. Death and Horror* was always one of my favourites, involving erstwhile BBC sound technicians, no doubt wearing white lab coats, doing all manner of unspeakable things to cabbages to imitate the sound of heads being severed, hot poker inserted in tender orifices and other amusing activities.

TV, video and film are clearly also ripe for sampling, though I'd be failing in my duty as a responsible member of the technical music press if I didn't point out that sampling any such pre-recorded source is actually illegal unless you have permission from the owner of the copyright — and that even includes music which is never heard outside your own headphones.

Indeed, take note that not all sample CDs are actually completely copyright-free if you intend to

use them for a commercial recording. A few sample-clearance issues are covered in the box elsewhere on the page, though the subject is worth a whole article in its own right. The good news is that because the music industry has generally wised up to the use of samples (and particularly how they can make money from it) clearance has become a lot easier. Look for an *SOS* article on that very subject in the near future.

There is a simple way round this, however, and that is that, if you use a pre-recorded spoken vocal sample as the inspiration for a song, make sure you then record your own imitation of the phrase. Again this is not completely free of pitfalls, because if a phrase can be readily identified with another work (if, say, you used the words "You played it for her, now play it for me", from *Casablanca*) you may also run into copyright issues. But in principle, this is the route I tend to favour, as it literally makes a sample your own. If you want to make it sound as though it has been culled from a recorded source, you can always mix in some vinyl crackle, fake distortion or dodgy EQ as appropriate.

On a slightly different tack, one technique I use to generate samples for my own material is to mic up the room you're working in and then leave a DAT or tape recorder running for part or all of the session. This way you pick up a lot of extraneous noises between takes — chatter, laughter, sneezing, the odd disagreement, throwing of chairs through the window and so on. You also end up with alternative versions of vocals and acoustic instrument parts, including various ad libs between the 'real' takes. When you listening back to these out takes you often come across some real gems of sounds, noises and loop fodder which can then be fed back into the mix.

And F-F-F-Finally

As I've said, the above list is far from exhaustive. The secret of good samples is partly developing an ear for an interesting sound, and partly having the technical capability to manipulate that sound with the equipment at your disposal. But the best samples often come about purely by accident — and for that, all you need is the ability to plug in a microphone and see what happens! *SOS*

Next month, we'll look at the various ways in which you can mangle digital audio using both stand-alone samplers and hard disk recording techniques.

Sampling Lore

When any work is recorded, then the recording is copyright, over and above any copyright that may exist in the work itself. So while Shakespeare's words or Mozart's notes may no longer be in copyright, a recorded performance of those works will be copyright of the performer.

If anyone records their words, say for radio or TV, then they have a share of ownership in that recording. That means a sample of

speech (a news broadcast, say) from the radio or TV will be copyright both to the person who said those words and the radio or TV station. If it's a play, then the author will also have copyright. If it's music from a film broadcast on TV, then five copyrights could be involved: one in the script, one in the music, one in the recording of the music, one in the soundtrack and one in the broadcast. Phew!

Music and sound on video and computer games is also copyright as a sound recording, so watch it!

Sampling Tips 3: Is That A Cliché In Your Sampler?

Certain samples have been somewhat overcooked, so it's best to get them out of your system early on before moving on to the more creative stuff.

Within the Cliché Hall of Fame are:

- Dog barks (though there's still some mileage left in reversed barks — or 'skrab'. Oh, and no-one's tried cats, hamsters or guinea pigs yet.)
- Smashing glass (but has anyone tried smashing pumpkins?).
- Blown bottles (although you can get some superb foghorn sounds this way).
- Cars starting, skidding to a halt or being wrecked by a JCB.
- Saucepans.
- Stuttering vocals *à la* "N-n-n-nineteen".
- Anything from a James Brown record. Not only will you get arrested by the cliché police, you'll get sued into the bargain.
- American evangelists on radio or TV. Not so much done to death, rather done so well on the Brian Eno/David Byrne collaboration *My Life in the Bush of Ghosts* that they are best left well alone.

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BOSS DR202



beat practice

BOSS DR202 DR GROOVE RHYTHM MACHINE

The recent welter of affordable, easy-to-use dance music-making instruments has now been joined by a rhythm box from the company that has arguably been most responsible for the current bpm-driven feeding frenzy — Roland, or more specifically in this case their *alter ego* Boss. The Boss DR202 Dr Groove is one of a continuing line of 'Groove Approved' Roland/Boss products aimed squarely at clubbing DJs, pro and semi-pro remixers, bedroom-based dance music techno-heads, and in fact anyone tempted by the broad church that is dance.

Not Just A Drum Machine

Given that the instrument arrives in a box marked 'Drum Machine' I think Roland are selling the

Dedicated rhythm machines are very much back in fashion, and the new Boss DR202 offers an impressive specification at a budget price.

Chris Carter investigates its qualifications.

DR202 a mite short: this is a drum machine, but it's a lot more besides. A quick rundown of the specification sheet reveals all — see the 'Basic Spec' box for details.

Though not quite as small as some earlier Boss 'Doctors', with a footprint of 10 x 8 inches the

DR202 is small enough to chuck into a DJ bag or holdall, and will run on batteries for up to eight hours — long enough for an all-nighter in a field. The top of the plastic case is pretty well crammed full of those nice rubbery function buttons and performance pads, and a row of eight knobs along the top deal with modifying the audio signal. Unlike the diminutive Dr Sample (reviewed back in *SOS* January '98), which has 18 flashing backlit translucent buttons, the Dr Groove has only five flashers, none of which are the drum pads. This is a shame, but probably a good thing from the point of view of battery life. Lack of velocity-sensitive instrument pads is also a big disappointment, although it does respond over MIDI.

The LCD display is a standard 'dark grey on light grey' 32-digit affair with no back light, making it almost invisible on a dimly-lit stage. Connections are basic but adequate, with a pair of phonos for the stereo output, MIDI In and Out (switchable to Thru), a headphone mini-jack and a standard quarter-inch footswitch jack socket (programmable). External power is supplied by a standard Boss 9V wall-wart PSU.

Dedicated Pads

For a budget unit, the DR202 has more dedicated controls than you would usually expect to find. This is fine by me, and even though most of the editing controls are multi-function, the editing process is still quite straightforward, once you take a few a cursory scans through the instruction manual.

When switched on, the DR202 defaults to Pattern mode, which allows you to start playing back some funky beats immediately (more on programming patterns themselves later). The pattern name and number is shown in the top half of the LCD, and selecting a new pattern using the left/right cursor keys and the data wheel is simplicity itself (using the shift button allows even faster scrolling). If you select a new pattern while another one is playing, the lower half of the LCD shows the next pattern to be played (see box for a list of preset pattern styles).

While a pattern or song is running, you can play along on drums, bass or an external MIDI source such as a sampler or synth using the 13 instrument pads. These are marked with a C to C scale and the names of a basic drum kit: Kick 1, Snare 1, Open HH, Hit 1 and so on. By default, the pads play the bass and drum voices from whichever kit is programmed into the current pattern, but you can change to other preset and custom kits while patterns are running.

The Bank Of Interaction

If that isn't enough interaction for you, there's also the option of twiddling a few knobs. The Volume and Low Boost knobs do exactly what they say, and next to these are the four unassumingly-named 'Realtime Modify' controls: Cutoff frequency, Resonance and Decay. These really spice up the sound and are what set the Dr Groove apart from most other run-of-the-mill drum machines. What we have here is a bank of 14 digital filters (13 for the percussion sounds and one for the bass) with an

Instrument selector knob to determine which VCF/voice combination is currently being modified by the control knobs: bass and drums, bass only, drums only or each individual percussion voice.

Having 14 filters at your disposal is pretty awesome, and the preset kits don't really demonstrate the extremes to which this instrument can, and probably will, be taken. Add the ability to record *any* VCF knob movements into a pattern in real time, and you begin to appreciate what a capable little monster the DR202 is. An 808 or 909 kit with each percussion voice, and the bass, modified by a sweeping resonant VCF, mmm... music to my (bleeding!) ears. However, it's not all plain sailing if you want to indulge in 'hands-on' modifying over a pattern with previously recorded knob twiddling, as you and the Dr Groove then fight over who has control of those fabulous filter sweeps.

Tempo & Tapping

Patterns will always play back at the tempo in which they were programmed, whether in Song or Pattern mode, but the tempo can be changed at any time by pressing the dedicated bpm button. With either a User or an edited Preset pattern the LCD shows two values, a fixed 'recommended' bpm (the Pattern bpm) and an adjustable bpm parameter. Once in this mode, you can enter a new tempo using the data dial (to the nearest 10th of a bpm) or use the Tap button to change the bpm 'on the fly'. I found the Tap method frustrating and sometimes not too accurate: the Tap bpm rate is calculated from the first four beats you tap out, at which point the display changes to indicate 'TAP bpm'. If you get carried away and continue tapping away after the first four taps, however, the LCD tries updating the tempo for each and every tap, which can result in the tempo drifting erratically by as much as 8bpm.

Very Effective

The last two knobs control effect parameters for the Reverb/Delay and Flanger, their function changing from kit to kit depending on what type of effect is programmed. If the effect is delay, the Rev/Del knob adjusts the feedback level; if it's reverb it controls reverb level, while the Flanger knob always adjusts the flanger output level. If either control is turned clockwise beyond the Off position, the LCD changes to show the current effect parameter value, whereupon pressing the right-hand cursor button scrolls the display through the various effect parameters for the current kit, which can then be adjusted using the data wheel.

There are eight reverb types, from halls to rooms, each with adjustable decay time and level and two types of delay, panning delay and stereo delay. The delay time can be set in milliseconds (5-450ms) or in bpm-related time divisions (10 settings from half-note triplets to sixteenth note triplets).

Although the effects features are limited, they sound fine within the scope of a typical dance-based rhythm. The effect parameters can be changed in real time while a pattern or song is playing, but adjustments can't be recorded to a

BOSS DR202 £299

pros

- Affordable and easy to use.
- Hundreds of great dance patterns and styles.
- Plenty of dedicated buttons and real-time control knobs.
- Some unique features.
- Portable (and with a decent battery life).
- Very very groovy.

cons

- Pads not velocity-sensitive or backlit.
- Real-time effects control not recordable.
- Slightly frustrating MIDI spec.

summary

So chock-full of groovy goodies it hurts. 256 drum and bass samples, 3-track pattern sequencer, external MIDI control, real-time control of multiple VCFs, digital effects, groove templates and literally hundreds of authentic dance patterns and kits. Exceptional value for money and little to complain about.

SOUND ON SOUND

BOSS DR202

- ▶ pattern, as with the VCFs, and any changes are lost if you select a new kit, as it's impossible to perform a save while a pattern or song is playing.

Recording A Pattern

As with most pattern-based drum machines, you can record rhythm patterns in real time or step time. You don't need to specify which track to record to as drums, bass and external MIDI are allocated automatically.

Real-time recording is the default mode, and can be activated only by first selecting a User pattern. This can be either an empty location, an existing pattern, or one of the preset patterns copied into an empty User location. Pressing the REC button puts the Dr Groove into Record Standby mode, sets the REC button flashing at the current tempo and starts the metronome ticking. At this point various options are offered: Name (eight digits), Measure (1-8), Beat (1/4 - 4/4 time), Quantise (nine resolutions from 8ths to 384ths). You can also practice tapping out rhythms along with the metronome until you are ready to go for a take, a which point you hit the REC button (or use the footswitch option). And that's basically it. Adding and overdubbing bass lines or external MIDI notes is done in exactly the same way, as track allocation is handled automatically. Step-time recording (also used for editing patterns) involves slightly more effort. For this you need to select the Step time option while in Record Standby mode and use the +/- step buttons to move backwards and forwards through a pattern, tapping the instrument pads at each step. Editing options available within Step Time mode include changing the kit or effects, deleting and inserting notes, adjusting gate time, inserting portamento values, inserting drum rolls, shifting instrument timing, muting individual instruments (without deleting them) and copying and deleting patterns. If an external source such as a MIDI keyboard is used to input drum or bass data the Dr Groove will record (in real or step time) note velocity for bass and percussion instruments and portamento data for the bass.

Kit In A Box

The DR202 includes 128 preset rhythm kits, each containing 13 different percussion sounds and one bass voice. Kit styles include Hip Hop (27 types!), Drum & Bass, Techno, House, Jungle, Electro, Ambient, Acid Jazz and Funk, and there are even a couple of Industrial kits. Of course there are plenty of Roland TR Rhythm Composer kits and a few traditional Rock, Pop and Latin kits.

64 user kits are available, with various programmable parameters for each of the 14 voices. These include instrument type (from 256 available), level, pitch, pan, effect send and cutoff, resonance and decay for VCF control — not a bad line-up. Effect parameters for the Reverb/Delay and Flanger are also set within a kit. Kit construction basically involves tapping a pad, selecting a voice for that pad, adjusting the parameters for the voice and moving on to the next pad. Kits can also be named and copied.

I must say I sometimes found the limit of 13 percussion instruments per kit a slight hindrance for creating really adventurous custom setups, but nevertheless some pretty decent kits can be put together quickly and easily if you can't find one from the 128 presets.

Song Time

Once all your rhythm patterns are assembled, you can think about putting a song together. This is achieved in a similar manner to step-time pattern recording, but with fewer options to worry about. Press the Song button, select an empty song location from the 19 available, give it a name, hit the REC button and use the data dial to select from the available Preset or User patterns. Then it's just a matter of stepping through the song using the +/- step buttons, selecting a pattern for each step. A Song tempo figure (from 40 to 250bpm) can be programmed to override the pattern bpm's, and patterns can be inserted into or deleted from an existing song.

Arsenal Of Sounds

The Dr Groove includes a full complement of 207 drum, percussion and SFX samples and 49 bass samples, including essential dance stalwarts such as the TR707, TR808 and TR909 and acoustic, electronic and distorted kick drums, snares, cymbals, blips, clicks, vinyl scratches (which the manual quaintly refers to as 'plastic scratches'), reversed percussion, and even the ancient Roland CR78. Bass samples include sawtooth, square and sine waves, electric and acoustic bass guitars, various SH101 waves and of course a selection of TB303 samples (notice the emphasis on Roland instruments anyone?).

But what does it sound like, I hear you say? Well... pretty good, actually. With the right kit, and some judicious use of the Low Boost control, the Dr Groove can really kick you in the guts. On the whole the sound is more 'budget' than 'pro' and some samples lack a little presence and 'oomph'. But it doesn't really matter that these samples don't sound like they're being produced by a top-of-the-range 16-bit sampler, especially in this price range. Dance music is more about feel and ▶

Basic Specification

- Instruments: 256 (207 drum, 49 bass).
- Rhythm Kits: 128 Preset, 64 User.
- Rhythm Patterns: 400 Preset, 100 User).
- Songs: 20 (1 Demo, 19 User).
- Effects: Flanger, Reverb/Delay (8 Reverb, 2 Delay).
- Real-time modify VCF controls (for each instrument and bass), real-time mute and solo controls.
- Maximum polyphony: 24 voices (shared between drums and bass).
- 3-track pattern sequencer.
- Sequencer resolution: 96 ppqn.
- Tempos: 40-250 bpm.
- Programmable Roll function (68 types).
- Groove quantise templates (20 types).
- Connections: stereo output (phono), headphone (mini jack), MIDI (In and Out); foot switch (quarter-inch jack).

Pattern Book

The Preset rhythm patterns are divided into 11 styles, which in turn are subdivided into various hybrid variations and tempos. According to Roland, "every genre of groove music is represented in these Preset patterns — all with street-level authenticity thanks to their legitimate DJ and dance music programmers". Who these authentic programmers are Roland don't (or won't) say, but they sound pretty damn good nevertheless.

Preset Patterns include:

- | | | | |
|----------------------|------------------|---------------|-------------|
| • Hip Hop | • Funk | • Trance | • Jazz |
| • Hip Hop East | • New Jack Swing | • Nu-NRG | • Acid Jazz |
| • Hip Hop West | • Abstract | • Hardcore | • R & B |
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GATE METER
Above and below Threshold indicators.

BYPASS LED
Channel is bypassed when this is depressed.

LINK STATUS
Shows stereo or 2-channel mono operation.

GATE RELEASE SPEED LED
Shows fast/slow Release status.

COMPRESSION METER
Shows gain reduction/ amount of compression taking place.

COMPRESSION RATIO
Sets the amount of compression/gain reduction.

LINK LED
Channel is bypassed when this is depressed.

INPUT/OUTPUT METER
Shows output level, also input level in "bypass".

CHANNEL 1

CHANNEL 2

PEAK LIMITER LED
Shows Limiter activity.

BOSS DR202

► emotion than sound quality, and the arsenal of sound-shaping tools, patterns, styles and overall grooviness of the DR202 compensate for any minor failings in the sound of the raw samples.

Grooves On A Plate

If you've had any experience of constructing rhythms using a software sequencer, you've probably come across groove templates before. The DR202 has 20 on offer, and they do the same thing, essentially quantising the timing and accents of a pattern to a preset rhythmic template. This is done so that it's not the actual content of the pattern that changes, just its rhythmic feel, and the pattern can be returned to its original state at any time. In the Dr Groove, templates can be used only on User patterns or Preset patterns copied to a User location, and are applied using the dedicated Groove button. Depending on the complexity of the rhythm, the process can be a little slow, as the groove template is applied to all three tracks in a pattern. Also, the DR202 insists on applying a groove template each time you select a new one from the list — no fast scrolling to the end or middle of the list, you have to step through each template and wait for it to be processed before you can move on to the next.

These foibles aside, however, groove templates are an invaluable tool for breathing new life into plodding or uninspired rhythms, and although the 20 templates here are uneditable there are enough to accommodate most dance styles.

Flam Rolls

The Dr Groove roll function is a little special, and unusual. It offers 68 pre-programmed drum roll patterns, including regular fill-ins and flams and also complete rhythmic phrases and dynamically filtered rolls. This latter bunch are the type you regularly hear in drum & bass tracks, which consist of ultra-fast rising or falling (in velocity and/or pitch) rolls, some of which use the VCF bank for even greater effect. Only two parameters are used: Type and Speed (from 00 — a slow tick-tick-tick — to 127 — blindingly fast warp speed), and these are programmed as part of a Kit. The Roll button can also be latched to allow individual percussion sounds to keep repeating *ad infinitum* while you play other non-rolling pads.


MIDI

The Dr Groove has a full, if slightly frustrating MIDI implementation. SysEx loading and dumping of all the internal

kits, patterns and setups is catered for, as is setting MIDI channels for bass, drums and external MIDI In and Out. It also responds to and transmits MIDI Volume, Pan and Control Change data for each track, Program Change for selecting Kits, Portamento data for the bass, all the VCF real-time controllers, effects levels, and internal or external MIDI sequencer control of Start, Stop and Continue. The bass and external sequencer tracks will also respond to MIDI modulation and pitchbend, which is great for expressive bass lines, though it's disappointing that the sequencer tracks will not record either modulation or pitchbend. The instruction manual doesn't give any specification for sequencer memory other than the maximum number of measures per pattern — eight — and the maximum number of patterns per song, 999. I tested it by recording a busy eight-bar rhythm pattern containing drums, bass and some MIDI sequences and chords, copying 100 patterns into a song, and copying the song 19 times, and the available memory still read 60 percent, so whatever the memory allowance is, it appears to be more than adequate.

The Doctor Of Groove

There aren't many rhythm machines around in this price bracket with quite the same unique features as the Dr Groove. If you add the feature-bursting but similarly priced Dr Sample to the equation you have, in effect, a mini workstation complete with stereo sampler, synth, drum machine, multi-effects and a MIDI sequencer for approximately £599, and I'll bet good money that dealers will start offering special bundle deals on the two as a 'dance workstation on a budget' package. Roland see this as the ideal combination, and supply details of how to link the two Doctors together and run the built-in (and sync'able) demos in tandem, to great effect I might add.

Combinations aside, at its very reasonable asking price of £299, the Dr Groove would be ideal for gigging dance musicians working out ideas on the road, DJs wanting near-state-of-the-art grooviness and portability, or someone starting out with a bedroom-based dance rig. With so many instantly accessible and usable bass and drum patterns and styles available at the touch of a few buttons, even pros wanting to bang out top-notch dance rhythms quickly and easily while those creative juices are flowing need look no further than the Boss Dr Groove. The bottom line is that it can be highly recommended for anyone producing dance music. 

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D I S T R I B U T I O N

ATC A7s

ATC make some of the most accurate studio monitors in the world, but their smaller speakers are also very popular with discerning hi-fi users, so they have developed the two-way A7, a small passive monitor primarily intended for hi-fi use. The A7 employs a compact but massively-built bass/mid driver, the centre section of which looks very much like an ATC soft-dome mid-range unit.

Whereas ATC's larger SCM10 has a very steady low-frequency rolloff, the A7s have a character somewhere in between that of the SCM10 and what you'd expect from a conventionally ported



class atc

hi-fi cabinet. The result is a little more bass in the 80Hz region, where most pop music concentrates its LF energy, balanced by a slightly steeper rolloff below this frequency. Overall, the frequency response extends from 60Hz to 20kHz within +/-6dB and from 100Hz to 14kHz within +/-2dB.

Handling the high end is a 25mm Vifa soft-dome tweeter, but whereas the SCM10 tweeter uses a conventional magnetic structure combined with ferrofluid cooling, the A7 uses a smaller, lighter Neodymium magnetic assembly augmented by a finned heat sink. Ferrofluid cooling is not used in this tweeter. The passive 2.5kHz crossover uses a similar circuit topography to that in the SCM10, though to save cost, the rear terminal panel is a plastic moulding and the crossover is mounted directly onto the back of this. The cabinets are finished in real wood veneer, not plastic foil, and are very nicely made with a high standard of finish. Each monitor weighs 7.5kg. For surround applications, ATC also build a centre speaker based around two of the same bass drivers plus a single tweeter in a 15-litre cabinet. A tower version of the A7 is also available.

With a nominal impedance of 8Ω, the A7s are around 3dB more sensitive than other ATC models, at 83dB at 1W at 1 metre. Recommended amplifier power is between 50 and 300 Watts per channel. However, these are very revealing speakers, so it is important to use them in conjunction with a good quality amplifier that won't distort at high signal levels. The maximum continuous SPL is 103dB, more than loud enough for nearfield monitoring, and though the A7s are not magnetically shielded as standard, a shielded version can be supplied at a nominal extra cost.

Performance

Though designed for the hi-fi market, the A7s are accurate enough to be used in discerning nearfield monitoring applications, and the depth of sound

ATC A7 PASSIVE MONITORS

they produce belies their compact size. They don't quite match the transparency and confidence of the more expensive SCM10s when pushed really hard, but they have the same general family sound, and at more realistic levels, they're incredibly clean and revealing, especially on difficult acoustic material. They have the same ability as the rest of the ATC range to present a three-dimensional soundstage, and even though these are the least expensive speakers ATC make, it would be wrong to consider them a poor relation in any way. What I really like about ATC monitors is how smooth well-recorded material sounds, particularly voices, and if you make an error when mixing, they'll let you know straight away. The sound isn't hyped-up in any way, so on first listening, some competing monitors may sound more impressive, but after a while, you realise that the ATC A7s are showing you what's really there. You can monitor on these speakers for extended periods without feeling fatigued, and because of their compact size, they will fit into virtually any compact studio or edit suite.

In Short

While the A7 still can't be classed as cheap, it does bring ATC quality into the affordable range, and despite its small size, the bass extension is quite adequate for use in small to medium-sized rooms without the boxy side effects of less sophisticated designs. Don't let the fact that this speaker is designed for the hi-fi market put you off either, as the A7 is engineered to the same standards as ATC's other products. If you're after a really good small monitor, the A7 won't disappoint. **SOS**

Paul White tests ATC's smallest and least expensive monitors to date, and finds that they still have the pedigree family sound.

ATC A7 £750

pros

- ATC quality at a lower price point.
- Extremely accurate and revealing, with the same family sound as the rest of the ATC range.
- Beautifully engineered and finished.

cons

- You can't get away with using an indifferent or underpowered amplifier as the speakers won't mask the flaws in the amplifier!

summary

An affordable (if not exactly cheap) and compact monitor that's accurate enough for the most serious of applications.

SOUND ON SOUND

information

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50 CHRISTMAS IDEAS FOR MUSICIANS

It's that time of year again. Pretty soon, someone is going to ask you what you want for Christmas. And your mind, as usual, is going to go completely blank. The result will be a stocking stuffed with three-packs of M&S pants, woolly scarves, gold-initialled, marble-finish ballpens that cease to operate by Boxing Day, and stinky stuff for bath and bod that's guaranteed to repel any member of the opposite sex at 50 paces. A no-no!

What's the answer? Well, read on for no less than 50 musical ideas that could turn your Christmas day into a winner and make your hols a festival of fun. Auntie Mavis can get you a super music biz book instead of a steam-train book, your Mum can brighten up your life with a pair of headphones instead of a pair of slacks, and if the woman or man in your life wouldn't know a MIDI lead if it slapped them in the face, just leave this article lying about with your desired gifts circled casually in red...

- **Master Your Sequencer** with Stephen Bennett's *Fast Guide to Emagic Logic*, £14.95 plus postage or Simon Millward's *Fast Guide to Cubase VST*, £16.95 plus postage. Both are published by PC Publishing and available from SOS Mail Order.
- **Go Direct:** MTR's D13 GT active DI box, featuring phantom power, ground lift, 20 or 40dB of attenuation, isolating output transformer and switchable 10dB output gain, costs £67.56 from Studiospares.
- **A Good Reference:** The *Soundcheck II* test CD, available from various outlets including SOS Mail Order, features all the test signals and reference recordings you need to make sure that your room and recording equipment are working at their best. The CD alone costs £28.99, while the CD plus built-in mic and spectrum analyser for use with the CD's 1/3-octave tone bands (to measure the performance of your recording room and monitors) costs £73.50. (Add £1.50 UK, £3.95 Europe or £5.50 rest of world postage.)
- **Burnish Your Bay** with Studiospares' Jackfield Burnisher (£18.74) which keeps the contacts of your jack or bantam patchbay in perfect, tarnish-free condition, while an integral hole

There are loads of handy gadgets out there to make a musician's life more fun, and every one of them is more desirable than socks or aftershave.

Derek Johnson & Debbie Poyser present you with a few ideas...

allows contact cleaner to be passed straight to the right spot.

- **Easy On The Eyes:** Tandy's computer filter screen is anti-static, anti-radiation and anti-glare, and costs just £19.99 — perfect if you spend a lot of time staring at the computer in your studio.

- **Carry On Gigging:** BCK's 61-note KB455 Keybag padded keyboard gig bag, £32.99, should be a perfect fit for a Korg M1, and will also suit various other 61-note keyboards. The Keybag range is available in 12 other sizes, with a deluxe double-thickness version on offer in two popular sizes.

- **Buy The Book:** *Recording & Production Techniques* by Sound On Sound's own Paul White allows you to take advantage of Paul's many years of recording and audio experience and his friendly and comprehensible way of conveying technical information. It costs £12.99 from SOS Mail Order. (Add £2.50 UK, £5.50 Europe or £8.50 rest of world postage.)

- **Rack Up Your 'Board** with Studiospares' rackmount computer keyboard tray, £60.51, compatible with any standard 19-inch rack, and occupying 2U of space.

- **Blinding Binding:** Red, leather-look SOS binders, at £10 for a pair (or £5.95 each if bought singly) from SOS Mail Order, let you keep your collection in top shape. Each binder will hold six of the current fat SOS's or up to 12 of the slimmer ones from earlier years. (Add £1.50 UK, £3 Europe or £4.50 ROW postage per binder.)

- **Stage Hand:** The Ultimate Support one-hand mic stand looks sleek and sexy, and can be raised and lowered with just one hand on stage because of its special clutch assembly. £65.74 from Studiospares.

The essential *Recording & Production Techniques* by Sound On Sound's editor Paul White.



Neato's CD labelling kit may be just the thing to add that 'professional' finish to your home-recorded demos.



Steinberg/
Propellerhead's
ReBirth RB338
provides TB303,
TR808 and TR909
sounds for both
Mac and PC owners.

- **Labelled With Love:** If you're lucky enough to have a CD writer in your studio, Neato's CD labelling kit (starting at £35) comes complete with a set of circular labels, an applicator to centre the labels, and a set of Mac/PC templates for popular graphics programs. The similar PressIt system costs around £41 from HHB.

- **Shake The Room:** The Zoom Studio 1201 Digital Reverb/Multi-Effects will cover many day-to-day studio processing needs for just £99.95. Check local hi-tech retailers or contact Exclusive Distribution for stockists.

- **UK Subs:** Keep on top of everything in hi-tech music with a year's UK subscription to the world's best music technology magazine — *Sound On Sound* — for just £36, a saving of 60p per issue over the newsagent price, plus 10% off all *SOS* books for subscribers. Overseas subs are available too — see the far right column on page 2 for details.

- **Shock Treatment:** Mic shock-mounts traditionally cost almost as much as the mic, but AKC's H30, at £34.66 from Studiospares, is the most cost-effective elastic shockmount you'll find, and it works perfectly.

- **Know The Biz Inside Out,** with *All You Need To Know About The Music Business* by Donald S Passman, £19.99 (plus £3.50 UK, £5.50 Europe or £8.50 ROW postage), and *Networking in the Music Business* by Dan Kimpeel, £11.95 (plus postage). Both from *SOS* Mail Order.

- **Protect Your Mics** to and from gigs with the Canford Microphone Shoulder Bag, £42.38. It has foam compartments for eight mics, a full-length side pocket, and smaller end pockets for mic clips, DI boxes, and so on.

- **Happy Birth Day:**

Steinberg/Propellerhead's *ReBirth RB338*, for both Mac and PC on the same CD-ROM, could be your big pressie, at £149 — which is a lot cheaper than the two TB303s, TR808 and TR909 it replaces. Check your local hi-tech retailer or call Arbiter for stockists.

- **Take Cover** and prolong your keyboard's life with a Keycover transparent keyboard anti-static dust cover, which also protects from accidental spills. Prices range from £6.99 (mini-keyboard size) to £9.99 (88-note keyboard) from BCK, and seven sizes are available.

- **Be A Vintage Synth Expert** with *The A-Z of Analogue Synths*, by Peter Forrest, Vol 1 (A-M) £14, Vol 2 (N-Z) £16 (plus £1.95 UK, £5.50 Europe, £8.50 ROW each postage), or Mark Vail's *Vintage Synthesizers*, £12.95 (plus £3.50 UK, £6.95 Europe or £9.50 ROW postage). Both are available from *SOS* Mail Order.

- **Computer Love:** Iomega's Zip affordable removable hard drive has taken the computer world by storm. The Zip Drive Deluxe kit, around £200 from Mac Warehouse, comprises a Zip Drive, eleven 100Mb cartridges and a mini carrying case. Other computer retailers will offer similar bundles.

- **Bodge Job:** Studiospares' Bodge Plugs, in different varieties, save you the trouble of making up leads when you're in a hurry, by allowing you to attach bare wires to sprung clamps. Available in male and female XLR, jack plug, jack socket, phono plug, phono socket, bantam plug and BNC female varieties, at between £10.51 and £14 each.

- **Make Friends With A Snake:** *SOS* Mail Order can supply a 3-metre, 8-way,



Ever wondered why the quality of PC audio recording systems is generally so poor? - One word: Jitter! Now here's the solution: The Aark 20/20 from Aardvark, the makers of the professional digital master clock generator, the AardSync II.

This is a multichannel system with eight 20 bit A/D & D/A's plus SP/DIF i/o - 10 simultaneous channels of record and playback. The software includes standard Windows drivers to fully support Sound Forge, Emagic, SEK'D, Cool Edit Pro, Cakewalk, etc... Plus custom ASIO drivers for Cubase VST. Then the control panel includes comprehensive routing and mixing. **It's simple to use, quick to install, and the audio quality will blow you away!**



The Aark 20/20 comes complete with HOST PCI card, 10 channel AD/DA/digital i/o interface box, interface cable, control panel software and Samplitude Basic by SEK'D, multichannel audio editing CD-ROM. - That's everything you need to turn your PC into a high quality multitrack audio recording studio!

It's in stock now, and will cost you well under eight hundred pounds. Ring us and we'll tell you where you can get one today.



▶ jack-to-jack snake that's perfect for connecting an outboard rack to a mixer, for just £27.90 (plus £2.50 UK, £5.95 Europe or £9.95 ROW postage). Also available in phono-to-jack and phono-to-phono varieties.

▪ **Racked Without Pain:** Storage capacity for 40 DAT tapes is available for just £15.21 at Studiospares, with their DAT storage racks, which can be free-standing or wall-mounted and are made from hard-wearing black polyethylene.

▪ **Case The Joint:** Argos' video/photographic case, £19.50, is compact, sturdy, shiny and lockable, and is perfect for dragging about gig necessities such as leads, spare strings, batteries, tuners, mics and tools.

▪ **Get Testy** with EMO's E445 cable and lead tester, which checks out the functioning of balanced and unbalanced jack and XLR leads and could save you a lot of messing about, for just £58.75 from the HHB catalogue.

▪ **Let Your Fingers Do The Twiddling:** Keyfax's Phat Boy puts MIDI hardware control at your fingertips and is brilliant for users of PC soundcards or faceless MIDI sound modules that don't have physical controls. And it's the cheapest hardware MIDI control unit yet, at £149.

▪ **All Tooled Up** with Tandy's 14-piece computer toolkit, including anti-static IC inserter, tweezers, four demagnetised screwdrivers, nut drivers, parts tube, and more, all in a practical zip-up case, for £13.99.

▪ **U Know It Makes Sense:** Studiospares' Stackrack accommodates an amazing 18U of rack gear for £75 and has remained a best-seller since 1985. It has an overall depth of 38.5cms, which extends beyond most equipment, providing protection for plugs and sockets. Its rear uprights can be secured to walls or other furniture for greater security, and it's finished in black epoxy resin. It's supplied flat-packed with 20 equipment-fixing screws.

▪ **Doctor That Disk:** Symantec's *Norton Utilities* for Mac or PC is the essential tool for the modern computer musician: it fixes or optimises sick hard disks, protects against software crashes and retrieves lost files, all with an idiot-proof user interface. It's carried by all good computer retailers and costs around £80-90.

▪ **Let There Be Light** in your rack with Studiospares' Fluorescent Racklight, a 1U box that slots into your outboard rack and sheds bright fluorescent light where you need it (especially good on stage), at £43.41.

▪ **Gig Gadget:** Canford's Roadie Rench, £18.42, is a kind of Swiss Army knife for gigging musicians, featuring various hexagonal keys chosen to suit musical instrument fittings, Philips and slotted screwdrivers, and a heavy-duty string cutter.

▪ **Atari Answers:** Floppyshop's *Sounds & Stuff: The Atari Musician's Toolkit* is an ideal resource for Atari users and won't break the bank at just £25 (plus £2 UK, £3 Europe, £4 ROW postage). Go mad with synth editor/librarians, MIDI tools, sequencers, sample editors. a huge collection of



sound samples, and more.

▪ **Get Ahead** with a pair of decent studio headphones. AKG's K240DFs cost £78.72 from Studiospares, have a semi-enclosed design and are comfortable enough to wear for hours. Also available in a K240M version, with slightly curtailed frequency response, for £70.38.

▪ **Disc Deal:** Media specialists Downsoft offer a box of 20 TDK CDR74 professional CDRs, suitable for pro CD recorders and data recording, at £25.62. Those with consumer-type CD recorders will want TDK CDRXG74 CD blanks, at £68.15 per box of 20.

▪ **Be The Chairperson** in Argos's 'Home Office Swivel Chair', featuring smart grey upholstery, deep padded seat and back, gas lift, back height adjustment, and back angle adjustment. It costs £58.99 and is great for home studios.

▪ **Foot Fetish:** Many synths offer volume pedal and/or continuous controller pedal inputs, and by plugging in a volume-style pedal — such as BCK's VP3 Volume Pedal, £17.99 — you can control

If you're fed up with mousing around on a monitor and want to get your hands on some real controls, check out the low-cost Phat Boy hardware controller.



The Kenton Pro Solo is a versatile single-channel MIDI-CV converter and works with almost any monosynth (see page 82).

Stocking Fillers

- **Tandy Rubber Feet:** protect your surfaces from being scratched by metal gear cases with a strip of eight large rubber feet for £1.59, or 12 small feet for 99p, from Tandy.
- **DAT Inlay Cards:** you're sure to need these at some point if you have a DAT machine, and they're just £3.26 per pack of 20 from Studiospares. CD Inlay cards are also available, at £12.69 per pack of 100.
- **BCK Keyclean:** this hygienic, deodorising cleanser is specially designed for cleaning modern hi-tech materials and comes as an anti-static foaming aerosol cleaner for even badly soiled surfaces (£4.99) or in the form of a tub of handy anti-static wipes (£4.99).
- **Security rackmount bolts** cost £3.26 per pack of 25 from Canford and deter thieves from removing equipment from racks. They have button heads so that they can't be gripped with pliers, and they're stainless steel to resist shearing with a hammer and chisel. A special fitting tool (£7.26) is needed to remove the bolts, as their recesses have a centre pin that makes the insertion of a conventional key impossible.
- **The Penguin Rhyming Dictionary**, £8.99 from good book stores, is a must for dedicated songwriters.
- **P&R Audio's Patchbay Ident stickers** (£2.20

per pack) come in packs of two sheets each, ready printed with useful legends and ideal not only for patchbays but also for use with leads and stage or wall boxes.

- **Maplin's VW89W Cassette Head Cleaner & Demagnetiser**, £2.99, contains a special cleaning tape and also incorporates a revolving magnet which quickly demagnetises tape heads as well as cleaning them. The cassette is supplied with a bottle of head-cleaning fluid.
- **Berol's Detective ultraviolet marker**, £3.11 from Studiospares (or check good stationery supply shops) allows you to invisibly mark your valuable gear with your postcode. The ink shows up clearly in ultraviolet light to help identify your property after loss or theft.
- **The Mouseclene kit** from Maplin consists of a tub of 25 impregnated cleaning wipes and a handy mouse holder to ensure that your mouse is always in top working order. Mouseclene (FC21X) is suitable for cleaning internal and external surfaces of all mouse/tracker ball systems, ensuring smooth cursor movement at all times. The price for all this hygiene is just £7.
- **Keep your CD-ROMs and/or sample CDs** thoroughly organised with Tandy's **Wallet Organiser** for 24 CDs. For just £9.99 this useful holder keeps discs clean, protected and all in one place.

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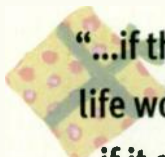
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▶ volume and/or any other assignable parameter without having to take your hands off the keyboard.

• **Going Solo:** A cheap and simple solution to adding MIDI to an ancient monosynth is Kenton's Pro Solo MIDI-CV converter (£99.99). The Pro Solo will work with virtually any monosynth — it can transmit a CV based on the volts/octave or hertz/volt systems, and outputs either a +5V trigger or an S-Trigger, as required by some Moog synths. It's also equipped with an auxiliary CV out (for filter or dynamics control, if the attached monosynth can take it), and is fully programmable.

• **Bay Watch:** Deltron's Swiftpatch modular patching system comes either as a complete patch panel furnished with 24 balanced modules featuring two jack sockets each (£58.63), or as an

 “...if the woman or man in your life wouldn't know a MIDI lead if it slapped them in the face, just leave this article lying about with your desired gifts circled casually in red.”

empty panel (£11.16) into which you can slot modules yourself (£11.86 for a bag of six). Each module can be half-normalled by simply rotating it — no soldering or unscrewing is involved.

The system is carried by several mail order companies, including Studiospares and Canford.

• **Spike Free:** The Rendar Lineblock mains filter, £22.31 at Studiospares, is a 6 Amp device designed to be quickly and easily wired into a mains lead to protect against power surges and spikes that can create clicks in audio and corrupt computer data — just the ticket for home-based studios.

• **Carbon Unit:** The CO2, from Midiman, converts between co-axial and optical S/PDIF digital audio, for just £45 — perfect if your PCI audio card or digital desk has a co-axial output and your DAT machine has an optical input, for example. It can also be used as a digital booster for long cable runs.

• **Well Strung:** Even if you've so far managed to rescue your guitar when it slips sideways from its usual position leaning against the wall, the worst is bound to happen at some point. Avoid the anguish of putting a scratch in your lacquer with a practical, good value ACS 25 acoustic or ECS 25 electric A-frame guitar stand from Studiospares. They cost around £15 each, and have non-slip rubber feet, a durable black finish and foam-rubber coated arm and back supports.

• **Split Personality:** feed a headphone output to

up to eight pairs of headphones with P&R Audio's HS8 headphone splitter, £35. Now all the the band can be back-seat drivers during the mix...

• **Tape That:** Ten of HHB's high-quality DAT65 65-minute DAT tapes weigh in at £59.93. That should keep you going for a bit, but if you can persuade a caring relative to shell out for 20 DATs, HHB will take 10% off the price.

• **Make Light Work** with a mini Maglite torch for poking around on darkened stages and behind gloomy outboard racks. Its high-intensity beam can be adjusted from floodlight to spot, and it has a free-standing 'candle' mode for when both your hands are otherwise occupied. Anodised inside and out for corrosion resistance, it's the Rolls-Royce of miniature torches and costs a miniature £16.39 from Studiospares.

• **Stay Tuned:** Everyone needs a decent tuner, and Korg's DT3, around £39.99 from instrument retailers, is a neat, stylish chromatic model with a built-in mic and quarter-inch instrument jack socket. It displays tuning in cents or Hz via a neat LED-based display that emulates analogue needle-type displays very nicely and will be visible even in low-light conditions. A flip-up stand on the back angles the unit for ease of use.

• **Clean Living** with Maplin's battery-powered ZA83A baby vacuum cleaner, £11.99, ideal for removing dust and fluff from between keyboard keys and mixer controls. It comes with two heads — a long-reach nozzle and a brush — and an easy-empty dust compartment.

• **MIDI Thru & Thru:** For MIDI systems that have grown beyond one synth and one sound module, or a computer and a synth, but not quite to a size requiring a full MIDI patchbay, a Philip Rees V4 MIDI Thru Unit, £19.95, could be a tidy alternative to chaining MIDI equipment together via Thru sockets — this also avoids any chance of data corruption or MIDI delays that chains of more than three or four MIDI instruments can be prone to.

• **A Stand That Delivers:** Gigging keyboardists will love the Ultimate Support DX48B Deltex two-tier keyboard stand. It features clips for concealing leads, has a load capacity of 22kg per tier, and looks the total business. It does cost £122 from Studiospares, but is built for a lifetime of on-the-road use.

• **Hit Kit:** Maplin's affordable electronics tool kit is presented in a cloth tool-roll and contain side cutters, a pair of long-nosed pliers with wire cutter, a light-duty flat blade screwdriver, a crosspoint screwdriver, a desoldering tool, and a soldering kit comprising CS iron, stand and pack of multicore solder. The whole lot, which is ideal for anyone who plans to make up their own leads or do simple repairs, costs just £32.99.

• **Testing Times:** The Studiomaster MA36 MIDI tester, £30.43 from Studiospares, is a neat little box which analyses a MIDI signal and identifies its MIDI channel plus the presence of all kinds of MIDI data types via the LEDs on its front panel. It's dead easy to use and is invaluable for tracking down gremlins in your MIDI system. **SOS**

Contacts

- T** **Arbiter:**
+44 (0)181 202 1199.
- T** **BCK:**
+44 (0)1992 524442.
- T** **Canford:**
+44 (0)191 415 0205.
- T** **Downsoft:**
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- T** **Korg Brochure Line:**
+44 (0)1908 857150.
- T** **Mac Warehouse:**
Freephone 0800 181332.
- T** **Maplin: The Maplin catalogue is available from WH Smith. Orders can be placed on 01702 554000.**
- T** **Midiman:**
+44 (0)1205 290680.
- T** **Neato:** 0990 561571.
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SOS can send a mail order flyer featuring a full range of books and other products on request.
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+44 (0)171 482 1692.
- T** **Tandy:** 0990 134935.
Tandy's catalogue costs £1 from Tandy branches.

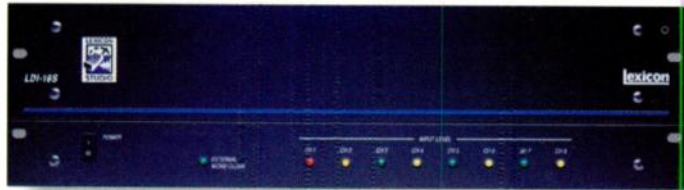
Mail-order buyers should bear in mind that postage will be charged in addition to the prices quoted here (except where postage charges are stated). Call for copies of mail-order catalogues from companies such as Studiospares, Canford, HHB, P&R Audio and Downsoft on the numbers above. Argos catalogues can be found at any branch of Argos.



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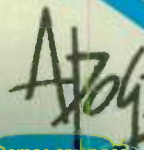
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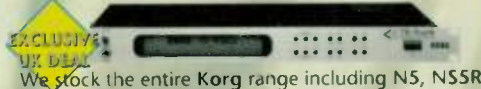
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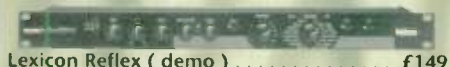


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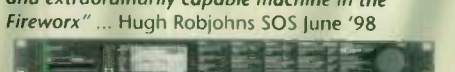
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RECORDING THE HONEYZ

What price chart longevity? These days, even singles by established groups seem to rocket into the top 40 chart, say into the top 10 or 20, hover in geostationary orbit for a week or so, and then drop off the chart like a dysfunctional Soviet space station. This current trend makes the stellar achievement of 'Finally Found', the recent single by all-female R&B act The Honeyz, all the more remarkable; particularly so if you consider that it was their debut single. A smooth gospel-tinged ballad decked out with crystalline multitracked block harmonies, 'Finally Found' shot into the singles chart at a very respectable number five in the last days of August, reached number four two



The Honeyz
(l-r): Naima,
Célena,
Heavenli.

tracks

PRODUCER STEVE LEVINE • RECORDING THE HONEYZ' 'FINALLY FOUND'

weeks later, and finally dropped out of the top 40 in early November, having clocked up 10 weeks on the chart, half of those inside the top 10.

However, train the investigative *SOS* radio telescope on the story of the single's creation, and its subsequent success becomes far less of a surprise. The Honeyz (comprising lead singer Célena Cherry, London-born German speaker Heavenli Abdi, and the French-born Naima Belkhaiti) may be a bright new act, but they have some well-known music business figures directing their fates. Management is provided by 1st Avenue, the company responsible for that other reasonably successful R&B female collective, Eternal, and their solo spin-off Louise. And in the studio, The Honeyz' producer is none other than regular *SOS* interviewee and digital evangelist Steve Levine, who has been responsible for the recording of the group's debut album, *Wonder No. 8*, due out at the end of November.

A Bedroom Studio With A Difference

Steve Levine declares himself 'pleasantly surprised' with the relatively long-lasting chart impact of the debut Honeyz single. It's important to realise that the track, and indeed the majority of the forthcoming Honeyz album, was crafted and recorded in Steve's home studio.

SOS has visited Steve's studio before (see the December '96 issue), but it's worth recapping some of the details. Long a fan of digital equipment, Steve tries to keep as much of his

recording chain digital as he can, but feels that you can only get the best out of such a system if analogue signals entering the digital domain (for example vocals and acoustic instruments) are recorded to as high a spec as possible.

Consequently, although his setup is based around four Alesis ADAT XT digital multitracks, an Emu EIV and Yamaha 02R and 01V digital desks, the mics and preamps at his disposal comprise some of the finest (and most expensive) analogue gear around — of which more later. Steve: "That's the kind of signal path I like; you go straight from this very expensive analogue input stage into the 02R, and then digitally on to the ADATs."

So, why the preference for digital gear? As Steve explains, it's all to do with getting jobs done quickly and efficiently. "I've always had leading-edge equipment like this, but it's just so that I can concentrate on the *real* work. Non-technical people look around and say to me 'You're running some kind of science lab here' — but in fact it's completely the opposite. If you like, I've got the very latest technology to ensure that technology doesn't get in the way. Take the 02R, for example. When you're working on a project like The Honeyz album, with multiple songs in various stages of completion at any one time, that desk's project snapshots are invaluable. One time, I was doing a bass overdub on one track when the girls turned up unexpectedly to do vocals on another track. I was up and running in seconds, ready to record. And so we got the start of something."

The Honeyz are a new R&B act, but behind the smash success of their debut single 'Finally Found' sits a familiar figure — Culture Club producer Steve Levine. **Matt Bell** dissects the track, and finds out how it was put together in Steve's compact digital home studio.



In The Beginning

It's nearly a year and a half since 1st Avenue initially approached Steve offering work with The Honeyz. Without a recording deal at that point, the girls had already worked with several producers, but the results had been largely unproductive. Steve picks up the story: "Despite all their previous work, they didn't really have any proper studio vocal experience; it felt like they'd only been given the odd half an hour here and there to put down their lead vocals on pre-recorded backing tracks. Fortunately, we all hit it off immediately, and began working on some tracks; some we co-wrote together, and some were rearrangements of existing material."

Amongst the existing songs were the rudiments of what later became 'Finally Found'. The girls had attempted to record the number with one of their previous producers, but with little success. According to Steve, he never heard that recording, but was treated to a live vocal-only demo of the unpolished song in his studio — in other words, Célena and Heavenli sang the basic idea to him. "From that, we worked out chords and an arrangement, and the song took shape. We eventually returned to it several times while making the album, re-recording Heavenli and Célena's lead vocals, because they changed the lyrics and the melody after we had recorded the track. That's another great freedom of the home setup, of course."

Track Building

First of all, Steve recorded a basic piano backing track, bringing in crack session keyboardist Darius Zickus to play a set of Steve's own Fazioli piano samples from his

Emulator IV. This performance was recorded over MIDI into Steve's Mac-based sequencer. At the same time, Célena sang a guide vocal into the hard disk recorder he had at the time, a 4-track Yamaha CBX (he has since upgraded to a Mac system based around an Emagic Audiowerk8). When the piano chords were later altered, it was a simple matter to re-record a section of the original piano MIDI file while keeping the majority of the track the same. Likewise, as the ideas for the vocal line changed, so sections in the hard disk recorder were replaced by new group vocals.

Steve: "We always had the piano and vocal to work with, so we were always working to melody — although that's rare these days, and I certainly didn't do it with all the tracks on this album."

"We then did a rough take all the way, recording the vocals onto ADAT and on into the computer, and Darius spent perhaps half a day refining his piano part in the sequencer. I then put a lovely room reverb on the piano from the under-rated Yamaha ProR3 on board my 02R."

With the basic chordal backing complete, Steve brought in his regular drummer and percussionist, Terl Bryant, to add rhythm parts. Terl played in a MIDI drum part from a drumKAT percussion controller, and Steve used this to trigger drum samples Terl had made on a previous visit. "The hi-hats and ride cymbal were recorded here, while the snare was a combination of one Terl recorded here and a few other samples from my CD-ROM [*the East West's CD-ROM of Steve's personally collected samples*] which I had manipulated in the EIV. There's also a Novation Drumstation with an internally distorted snare and a bongo. But the essence of the groove came from Terl's drumKAT performance.



Steve Levine at home with his cherished 02R.

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RECORDING THE HONEYZ

► On top, Terl then layered real percussion — congas — which I chopped up and made into loops in my EIV. Finally, there are some real fingersnaps going through the distortion algorithm on a Zoom 1204, which I really like.

"Next, we overdubbed the bass. That was interesting, as everybody fiddled around with it! I had some initial discussions with the bassist I use, Francis Hylton, and we decided to go for a bass line with a dub feel. We tried electric bass, but it just didn't fit sonically. So Francis played a dub bass line into the sequencer from my Novation BassStation, using a custom patch. There's quite a lot of real-time performance on that; bends and sliding notes.

"Subsequently, Darius and I, along with the girls, edited what Francis had done in the sequencer, trying different notes in a couple of places. That's the great flexibility of having real performances as MIDI files, of course. Finally, right at the end, Paul Meehan, who did the programming on the album, changed some more notes, and so did I. So the bass line was really a case of 'all hands on deck!' But the essence of the bass, its basic rhythmic feel, is what Francis played."

With the bass line in place, the backing track was completed with the addition of a filtered synth wash from Steve's Korg Vastation, and an acoustic guitar track.

Honeyed Vocals

Steve Levine has built much of his reputation as a producer on his ability to extract stunning vocal performances from artists. "The vocal is so incredibly important on a track. In engineering terms, I can get the sound in a few seconds, because I set up mics for vocal recording all the time. I have three or four mics and I know fairly quickly which one I'm going to use, and where. It's not just all about sound though; it's getting a good performance. I think I know now how to get good results from people, and I can instinctively tell when a vocal is right. The irony is, I'm not a singer myself — I can't sing to save my life!

"With The Honeyz, my mic of choice was the Neumann TLM170. It was either that or the Sanken CU41, but I think that suits male voices or lower-range female voices better — that was what I used to record Boy George and The Beach Boys in the '80s. Anyway, for The Honeyz, I put the TLM170 straight into my Focusrite 215, then my Summit Tube EQ or my custom-modified dbx 165A compressor. Occasionally, I used a bit of George Massenberg EQ as well. As I said, it's an expensive chain, but I think that's what gets results.

"There were quite a lot of vocals, because apart from the 'Finally Found' vocal hook, there is a whole block of 'oohs' in the background. Célena did those all herself; it's four-part harmony, tracked many times. However, if you listen, you can hear all their voices at different times. Célena did the verses, and Heavenly did the little bridge that goes into the chorus, the second half of the verse. The very high voice on the chorus, in the

harmony block, is Naima. We tried everyone out on the different sections, and would decide who got to do the different vocal parts depending on who had the most suitable tone for a given part."

At The Mix

When it came to mixing 'Finally Found', Steve had built up a total of 72 instrumental and vocal tracks. To simplify matters, he transferred 48 tracks to a Sony 3348 digital multitrack and retained 24 vocal tracks on his ADATs, with the lyrics and background 'oohs' separate for greater mixing control. Few out-and-out effects processors were used at the mix, Steve being a fan of printing tracks to ADAT complete with effects as recording proceeds, although a lot of Focusrite outboard — compression and EQ — was used at the mastering stage. Reverb and delay (from an Eventide H3000 and TC Electronic 2290) were therefore added to the vocal tracks as they were recorded, as was some processing courtesy of the Mac-based Waves *TrueVerb* plug-in: "I like my ADATs to be pretty much ready for the mix; I prefer to get a picture of how the finished track's going to sound. And I still believe that sequencing everything live to the master is not as tight as having it printed to tape first. I've got Emagic's latest Utor8s with Active MIDI Sensing, but it's still tighter to print it."

Please Let Me Wonder

Following the major success of 'Finally Found', Steve is looking forward to the release of The Honeyz album in late November, believing it will put The Honeyz on the map as artists with plenty of scope for development. "They're all very attractive girls, very bright and articulate, and they now have an awareness of the record-making process that they quite clearly didn't before. Towards the end of the recording, Célena was here with me doing the vocal comping, and commenting on what was technically wrong with each take.

"I really think we're still only scratching the surface of what they're capable of. Having said that, I have to say that the album contains some of the best work I've ever done." **SOS**

A Hard Drive's Gonna Fall

Steve has stuck with his ADAT XTs for many years, and despite the ever-falling prices of hard drives, shows no sign of abandoning digital tape yet. But surely, for a man so in love with random access recording, this is the logical next step?

"I know everyone's going over to hard disk — and I am as well to an extent — but I still believe that when you're working with singers, the BRC with ADATs is a very hands-on system. They're very portable — and if you run out of tracks, you just put in another tape and you've got eight more! With hard disk and a computer, you end up with billions of files — and I *still* don't think computers drop in and out properly. You can set up a program to punch in on a certain bar and then out again, but that takes a few seconds to do. If you've got someone raring to sing, you need to punch in and go! With the BRC, I always have every bar on a locator, so I can go back to any song section instantly."

Auto-Tune, Not Auto-Pilot

Steve is a big fan of software plug-ins, particularly Waves processors. One of his other favourites is Antares' *Auto-Tune* pitch correction utility. However, he believes many people are seriously over-estimating its abilities.

"When I first got a Fairlight, some people seemed to think it was a kind of magic box — as if you just pressed a button and out came a smash hit. In reality, you had a few megabytes of sample RAM, 8-bit quality, and you still had to play the bloody thing! Those same people now seem to think that *Auto-Tune* will polish a turd. It won't. If the vocal is *slightly* out in places, you can go in and fix it, but you still have to tweak it manually. It does have an Automatic mode, but I don't think it's that great, to be honest. And if something is more

than a semitone out of tune to start with, it will sound *terrible*. But some record company people seem to think you can just haul in any Herbert off the street and use *Auto-Tune* to turn him into Luther Vandross.

"Another thing about *Auto-Tune* is that if you use it on everything, great things like double-tracking stop working, because both the tracks are too similar. Finally, mere mention of it sends shudders down an artist's spine; they think they're not professional. That ad with the vocalist with the bag on their head is actually pretty accurate... If I'm going to use it, I'd much rather do it with an artist present, so they can see exactly what I do with it. I use it to enhance, but I don't spend hours with it, because it's actually much quicker to just sing it again!"

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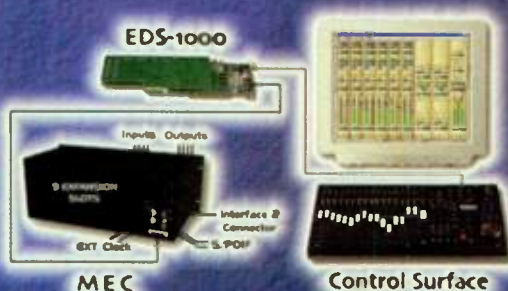
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MEASURING PC HARD DRIVE AUDIO RECORDING PERFORMANCE

Once you move beyond an entry-level PC (as I just have — see the box on page 100), it becomes even more important to optimise your system if you are to achieve its maximum potential. You may have the fastest SCSI drive in the world, but this doesn't automatically ensure a blistering MIDI + Audio performance. This depends also on both operating system and audio software settings, as well as setting up the hardware correctly.

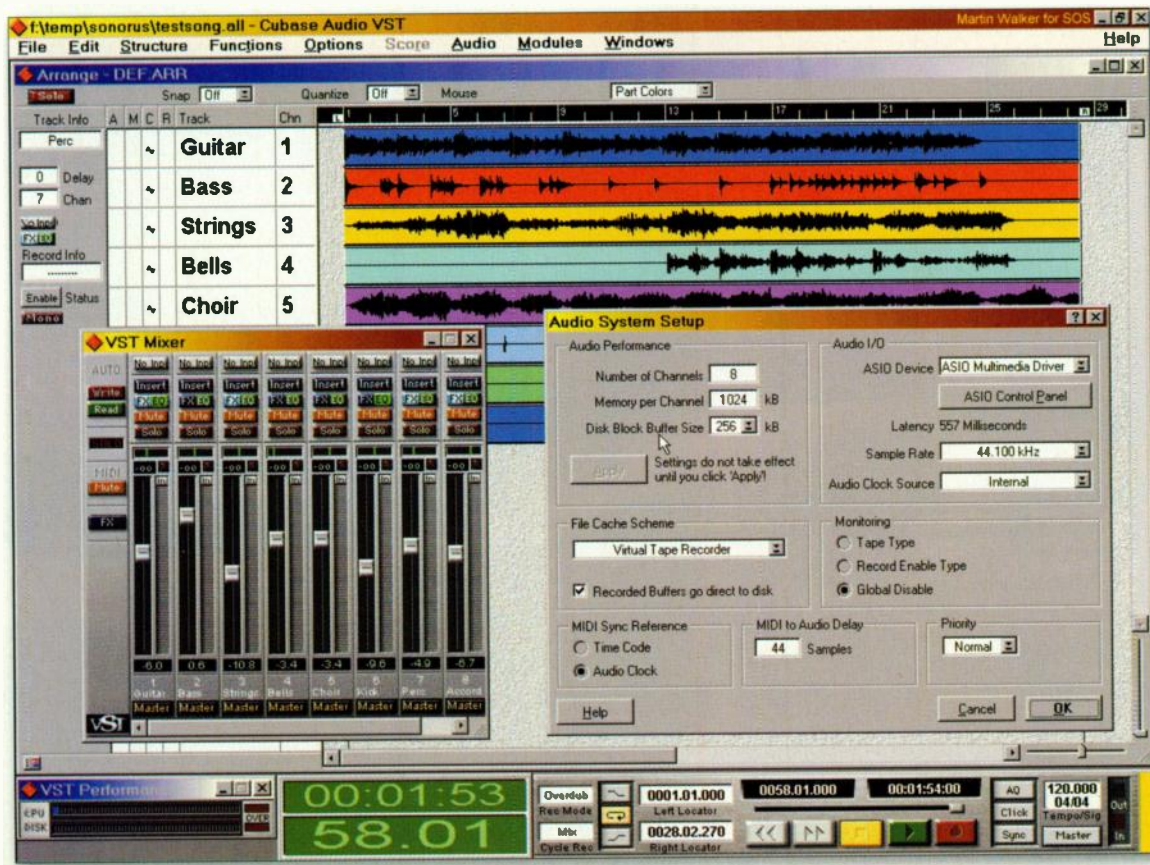
When measuring hard disk performance for audio purposes, it is the sustained data transfer rate of the drive that is important, but manufacturers rarely give this. Access Time and Spin Speed are often quoted, but frequently only a burst transfer rate is given (which of course is a lot faster than the sustained rate). Even when you do have such figures, however, it can be tricky to work out how many audio tracks your system is capable of giving you, because many other things affect this number. Any of you with a SCSI drive and a copy of Adaptec's *EZ-SCSI* will have the *SCSIbench* utility (see opposite), which allows you

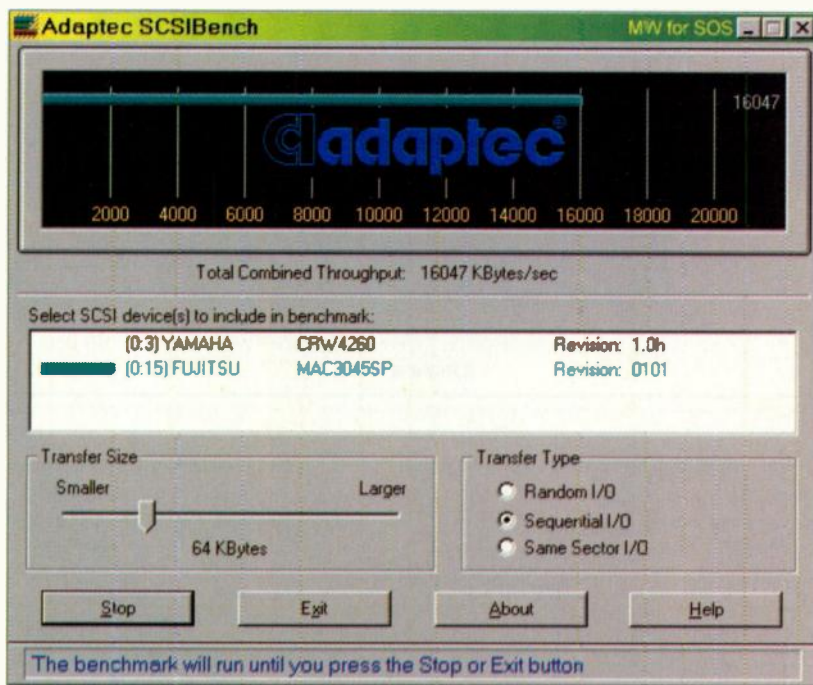
What's the best way to set up your PC's hard drive for digital audio recording? Useful statistics can be hard to come by, so **Martin Walker** runs his own tests.

to select Same Sector, Sequential, and Random reads during drive speed tests. As you might expect, continually reading the same sector from any hard drive will give far higher results than when moving the read/write heads as you go (Sequential), and the slowest speed will be when leaping about all over the drive (as you would if it had a lot of fragmentation, for instance).

To give you an example, after I had set up tests for a 64K transfer size, the Ultra Wide SCSI drive in my new machine gave a reading of about 15Mb/sec for Sequential reads (this is the most useful figure). For Same Sector I/O, however, this leapt to about 31Mb/second, and for Random I/O it plummeted to about 4Mb/second, due to the

Ever wondered what this insignificant little box (and similar settings in other audio software) actually alters? Read on, and see just how important the correct settings can be to get the maximum number of audio channels from your software.





Sustained transfer rate is highly dependent on the type of transfer. Hard disk audio recordings use largely sequential I/O, due to relatively large file sizes, but real-world figures will be highly dependent on the transfer size, which can often be set inside Audio software.

large amount of read head movement in between each actual read. The random figure also varies hugely as you change the transfer size, since this determines how often the heads have to move to a different location, and therefore the proportion of the total time spent actually reading information. This, as we will see later, is the clue to the performance of hard drives in audio applications. Before that, though, let's consider three factors which contribute to hard drive performance: your choice of FAT (File Allocation Table), your PC's internal buss speeds, and whether or not buss mastering is used.

A FAT Chance

Those of you with either Windows 98 or the most recent Windows 95B (OSR2) release have the option of formatting your drives with either the FAT16 (File Allocation Table) or FAT32 file systems. To find out which version of Windows 95 you have, open Control Panel/System. On the

General page, under Microsoft Windows 95, you will either see 4.00.950 (the original release), 4.00.950a (with the service pack update), or 4.00.950B (for OSR2). PCs supplied with Windows 95B or Windows 98 will probably already have their hard drives formatted with the newer FAT32 system, which has the advantage of using the space available on a large drive in a more efficient way, by using much smaller cluster sizes (normally 4Kb). The cluster is the smallest unit of storage available, and a 1-byte file will still occupy a single cluster.

By contrast, with the worst case of a partition of 1 to 2Gb in size, a FAT16-formatted drive would use a single 32K cluster to store this 1-byte file. Over the contents of a typical drive, this wastage can result in dozens of megabytes of extra unusable space. FAT32 also overcomes the annoying 2Gb maximum size available to FAT16 partitions, which forces you to divide up drives larger than 2Gb whether you want to or not.

So, opting to use FAT32 will typically result in more drive space being available, as well as the option of using partitions greater than 2Gb in size. Sadly, few things in life are free, and this is at the expense of a slightly larger overhead during file reads and writes, due to the more complicated directory structure with lots more potential entries. For this reason, many PC Musicians have carried on with FAT16. However, you can force larger cluster sizes with FAT32, either using a command line when reformatting your drive from DOS, or far more elegantly with the third-party application *Partition Magic*. The benefits for huge audio files are that larger clusters mean fewer read/write operations, and you are also likely to get less fragmentation to take care of.

There have been many mentions of the pros and cons of using FAT32 on the Net, but many of these have been anecdotal, so in the interests of proper scientific research, I carried out some tests on an empty drive with my new machine to see what I could establish. Assuming that we keep our drives well defragmented, the main FAT overhead is likely to be the number of read/write operations carried out during the course of a read or write. ▶

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PC HARD DRIVE PERFORMANCE

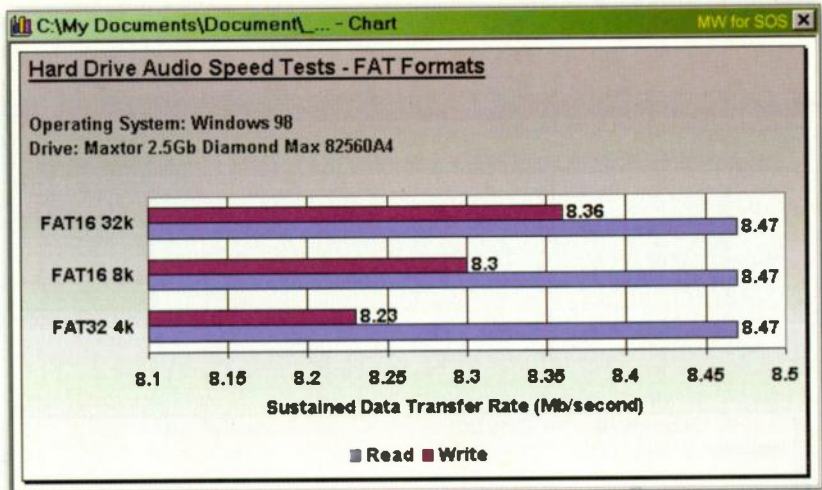
► After some hours of testing, I came to the conclusion that the problems have been exaggerated. I measured absolutely identical performance when reading multi-channel audio after formatting my drive in turn as FAT16 with 32K clusters, FAT16 with 8K clusters, and then FAT32 with 4K clusters (see graph, right). This may be because I was using Windows 98, which may have further optimised file operations, or it may be that my Pentium II 300MHz machine minimises the different overheads, which might show up more on a slower machine. The write speed did vary slightly, but before you race off to reformat your drives, notice that the difference only works out to 1.6% (hardly worth bothering about).

To check that Windows 98 was not the saviour, I ran two more sets of tests with Windows 95, and Windows 95B (this time both with no buss master support, since this is not available for the original Windows 95 version — see later). Again, there were no worthwhile differences — although there were repeatable differences in read and write speeds, they amounted to less than one per cent. I think we can safely assume that in terms of file read and write speeds, the choice of operating system seems less important than the choice of FAT format type, which itself seems pretty minimal as long as you have a fast machine. I suspect that the FAT16/32 arguments might change if a huge number of small files were being accessed, but hard disk recording tends to open only as many files as there are audio tracks, and these are all large. It still makes sense to use larger cluster sizes if possible, as there is bound to be a slightly greater overhead on a cluttered drive, but on the basis of my results I have formatted my audio drives with FAT32 and 16K clusters.

Bus Times

One widely misunderstood area of hard disk transfers concerns the data transfer rates relating to different busses inside the computer. A Fast SCSI buss can move data at 10Mb/S, a Wide one at 20Mb/S, and an Ultra Wide one at 40Mb/S, while the latest Ultra DMA EIDE transfers can take place at 33Mb/S. However, this doesn't make any of them inherently better or worse for data transfer, since whichever buss happens to be carrying the data, the limiting factor will normally be the sustained transfer rate of your hard drive, which will probably be somewhere between 5 and 15Mb/second.

Let's say you have a 10,000rpm Ultra Wide SCSI drive, which provides a blistering 15Mb/second capability. The fact that the Ultra Wide SCSI buss offers a maximum speed of 40Mb/second won't make your single drive go any faster, but you will normally be able to run several drives simultaneously on the same buss, which can be used by RAID arrays (see 'Spreading The Load' in the December '97 PC Musician for more details). If you have a Fast SCSI drive, upgrading to an Ultra Wide host adaptor card won't make it go any faster



— again, the limiting factor is the drive itself.

Similarly, the fact that the latest Ultra DMA EIDE drives have a maximum transfer rate of 33Mb/second is largely irrelevant for our purposes. Sometimes the maximum burst speed of a drive can momentarily reach much higher values than its sustained rate, but for hard disk recording it is always the sustained figure that is important, since we rely on this to keep a steady flow of audio data to and from the soundcard.

In fact, an occasional cache-boosted surge for a fraction of a second can cause other problems. Since the SCSI host adaptor card is plugged into the PCI buss, if transfer rates attempt to shoot up to the maximum 40Mb/second, then the SCSI host adaptor can block the PCI buss (the maximum rate of which is only 33Mb/sec). If you are using a PCI buss mastering soundcard (such as those from Event, or the Korg 1212), you may experience occasional clicks and glitches, due to there temporarily being no PCI bandwidth left for the soundcard to operate. For this reason, Steinberg recommend reducing the maximum transfer rate of the SCSI buss to a lower setting like 10Mb/second (from the SCSI BIOS). Even 10Mb/second is sufficient to achieve the maximum 32 simultaneous tracks offered by VST. This is no doubt also the origin of the Buss Throttling tweak for S3 graphics cards, since PCI graphics cards can also grab the entire bandwidth of the PCI buss unless told otherwise.

Buss Mastering

There is little point in repeating the EIDE-versus-SCSI argument here, except to say that although the latest EIDE drives are extremely fast, the fastest (and the most expensive) drives still tend to be the SCSI models, and in particular those running at 10,000rpm. However, a fundamental factor with both types is that drives will take a large chunk of your available CPU power unless buss mastering is being used. SCSI host adaptor cards are available with and without buss mastering — in the Adaptec range, for instance, this is the reason why the 2940 model (in its various incarnations) is the most popular.

However, for EIDE drives, most modern PCs have this facility built in. The first motherboard chipset to offer this facility appeared in late 1995,

I tried formatting one of my drives using various FAT types, but judging by the figures I measured, FAT32 isn't the ogre it's made out to be. Read speeds were identical for all three types I tried, and write speeds only varied by 1.6% — nothing to worry about there!

“You may have the fastest SCSI drive in the world, but this doesn't ensure a blistering MIDI + Audio performance.”

- multitrack audio application has to open and read various large files (one for each running track). The most accurate results will be obtained from these utilities if you make sure that no other applications are being run at the same time.

Probably the most easily available disk test program that fits this description is the *Echo Reporter* from Event, which is freely downloadable from their web site (www.event1.com). I have downloaded this a couple of times in the last year, and it has changed slightly during that time. The latest version, 2.01, has a more thorough system analysis (the previous one couldn't examine the IRQs on some machines), and the transfer file size has increased from 32Mb to the current 128Mb. This does mean that the latest version takes four times as long to run the disk speed test, but it should make the results more accurate and repeatable.

Another one that I've found recently is *DskBench*, which can be found in the software section of www.prorec.com. It's basic and unpretentious, and needs to be run from the drive you wish to test (for multiple drives, simply copy it across to each one — it only takes up 41K). Both this and *Echo Reporter* set up eight files, long enough to defeat any caching in place (128Mb in the case of the *Echo* utility, and 16Mb for *DskBench*). However, *DskBench* has an added feature in measuring sustained transfer rate for a single file, using a huge 256Mb file read sequentially. It also carries out its multi-file tests using various block sizes varying between 128K and 4K (see later), and measures percentage CPU overhead. The downside of this is that the tests take an age to run (the first time I ran it I thought my PC had crashed), but I found its results very repeatable, which made it easy to see the result of any adjustments. If you want to terminate the tests before they get right down to the 4K block size, you can safely use the 'three-fingered salute' (Ctrl-Alt-Delete keys) and then End Task.

Repeatability

The first few times you run any utilities like this, you will probably be disappointed at the low transfer rates measured. The reason for this is that we are not measuring maximum burst rates, and not even the maximum sustained transfer rate, but more realistic figures based on reading and writing

multiple audio tracks. However, any form of sustained transfer rate can only be measured accurately if file sizes are large, so that whatever cache system is currently being used, it will soon be emptied, and the remainder of the data transfer will be directly from the drive itself, rather than from some high-speed memory buffer. The only disadvantage of this is that due to the large file sizes, tests will take longer to run (at least a few minutes), but this is the only way that you will be able to see whether the operating system tweak you have made has had the desired effect.

However, when you are using disk speed utilities, don't expect them to give exactly the same figures every time. There are so many processes going on in any computer that there will be slight variation (probably of the order of a few percent) every time you run the test. Of course, where hard disks are concerned, a heavily fragmented drive will be significantly slower than a freshly defragmented one, so you can ensure more consistent results by running a 'defragger' utility before carrying any tests, to keep the playing field as level as possible. In fact, if you are planning to try out a selection of suggested tweaks, it makes sense to do them all in the space of a few hours. If you start by fully defragmenting your drive, and then carry out the adjustments one after the other, you will minimise the chances of anything else changing in the meantime, and then you should see the results of your tweaks more easily.

Splitting The Load

I've already mentioned that to simulate using a hard drive for multitrack audio, utility programs need to open multiple files and read them using streaming. This simply means that a small chunk of each file is read in turn and stuck in a set of RAM buffers, which then hold enough audio data to keep the soundcard going until the next batch of reads occur. As long as the buffers are big enough to ensure that the file reads stay ahead, audio playback should never stutter or glitch.

Now we finally come to the big difference between those impressive sustained transfer rates, and the reality of multitrack audio. Each time the drive read heads move from one track chunk to the next it takes some extra seek time, and this appreciably increases the total time taken. The

“Don't expect disk speed utilities to give exactly the same figures every time. There are so many processes going on in any computer that there will be slight variation every time you run the test.”

Putting My Money Where My Mouth Is

As I reported in last month's PC Notes, I have just bought a new, faster and more powerful PC, complete with a 300MHz Pentium II processor, and a separate SCSI hard drive specifically for hard disk audio recording specifically chosen for its low acoustic noise. When buying a system, everybody's needs will be different, but it is worth briefly explaining my rationale. I chose a 300MHz Pentium II as the best value for money at the time of purchase, but although this works with a 66MHz front-side buss (see September's PC Notes), I specified a motherboard with one of the new 440BX chipsets which supports the new 100MHz buss speed. I also requested 64Mb of 100MHz-capable SDRAM, with the result that as

and when future requirements and funds permit, I can simply upgrade to a 450MHz Pentium II processor, without having to change any other components.

My hard drive requirements are fairly modest (I'm ruthless about purging unwanted software, and don't indulge in games), and so chose a 2Gb EIDE drive for installing my operating system and applications. I chose Windows 98 to research last month's PC Musician feature, but also transferred across the 2.5Gb EIDE hard drive from my previous PC, and installed Windows 95 on this. Rather than use dual-booting software, I find the easiest way to swap between them is to enter the BIOS during bootup, and change the entry for my Windows 98 C: drive to 'None'. Then my

second drive automatically becomes the C: drive, and boots up into Windows 95 instead. I intend using this for compatibility testing, as well as for reviewing software and hardware that is only on my machine a short time, so that it can be purged regularly. This may seem a bit of a waste of a 2.5Gb drive, until I explain that I've partitioned it as 0.5Gb (500Mb) for the Windows 95 operating system, leaving me with another 2Gb partition for more general storage.

My main audio drive is a Fujitsu MAC3045, an Ultra Wide 4.5Gb SCSI device that spins at 10,000rpm but still remains blissfully quiet compared to many others. This may not seem very large for audio, but still provides enough space for 106 minutes of continuous 8-track recording, or 53 minutes of 16-track — fine for my purposes.

PC HARD DRIVE PERFORMANCE

► after Windows 95 first appeared, and so the original Windows 95 release did not have buss master drivers. Windows 95B (OSR2) arrived with Microsoft buss master drivers, but by then the newer TX chipset offered a new and improved Ultra DMA Mode, and motherboard manufacturers are still supplying special Intel-written drivers for best performance. These will normally be already installed if you buy a new PC that benefits from them, and most new motherboards will arrive with a floppy disk containing the relevant drivers.

As you might expect, Windows 98 includes the latest buss master drivers, and automatically installs them. Mind you, buss master operation is not enabled by default, and it is vital that you check that your drives are running in buss master mode if they support it (most modern ones do). Buss master support needs to be enabled for each EIDE drive (and any non-SCSI CD-ROM drives), and you do this from the System section of the Control Panel. Under 'Disk drives', click on the Properties button for each EIDE drive, select the Settings tab, and then make sure that the DMA box is ticked. If you don't see this box, it may be because this facility is not available on your PC, or that you have already installed specific hard disk drivers from your hard drive manufacturer. You will need to restart your PC for the changes to take effect, but the results will be well worth the wait.

If you buy a complete system, buss mastering should already be set up on your machine. Since I decided to personally install all the software on my new machine, however, the first time I ran the *Dskbench* utility (see later) it showed reasonable EIDE hard drive speeds, but colossal CPU overheads. With my Fujitsu MPB3021AT drive, Sustained Transfer Rate measured 6.3Mb/second and took 98.8% CPU time before activating buss master DMA; directly afterwards it measured 8.8Mb/second, and took 1.4% CPU time! By comparison, my SCSI drive measured about 2% using an Adaptec 2940 host adaptor card. Although its read speed was a sustained 15Mb/second, however, write speed initially measured slightly under 6Mb/second. This turned out to be because SCSI drives are normally shipped with their read cache enabled, but not the write cache. Using *EZ-SCSI's SCSI Interrogator* utility, I enabled the write cache, and the write speed immediately jumped up to 14.5Mb/second.

If you have the original release of Windows 95, the lack of buss mastering won't stop you running any real-time plug-ins on the EIDE drives due to lack of processor time, but it will limit the maximum number of audio tracks that you can run alongside plug-ins. Also, whatever the number of audio tracks you are running, there will be significantly less processor time left over to run plug-ins.

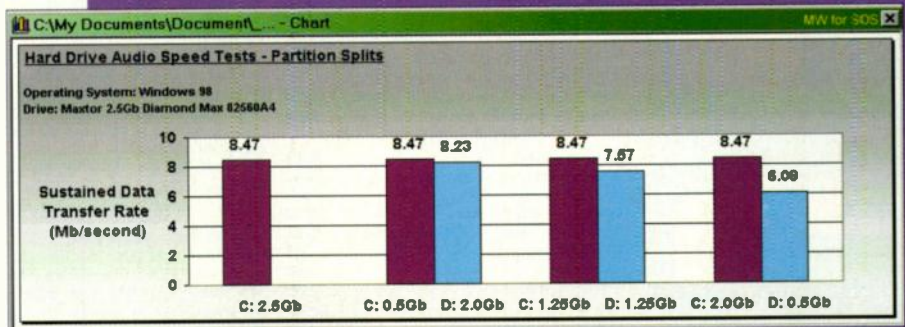
Having got everything hunky-dory with my Windows 98 installation, I temporarily rebooted under Windows 95B, and re-ran my tests. As expected, buss mastering was not enabled, so I ran

Divide And Conquer

One factor that surprises many people is that the sustained data transfer rate varies across the surface of the disk — it is fastest at the outside edge, and slowest at the inside. This has several knock-on effects. Firstly, since drives are filled from the outside in, your transfer rate will reduce as more and more files have been written to the drive. In other words, an almost-full drive will have slower performance than an empty one. Secondly, if you create several partitions on a single drive, the first will be faster than the second, and so on. Finally, bear this in mind when running speed tests. If

(as you would expect), but the inner 2Gb one was noticeably slower. I then reformatted twice more, so that I could measure a partition starting half way across the drive (by splitting it into two equal 1.25Gb partitions), and finally near the inside (by creating a 2Gb outer partition, and a 0.5Gb inner one). The results can be seen in the graph below, and they show that on my drive, the sustained transfer rate has dropped by about 10% in the middle of the drive, and by about 30% towards the inside.

The moral of all this? If you want to split your drive into several partitions, the first tends to be for the operating system, so make this small. In my case, using a 500Mb partition



it's several weeks or months since the last time you ran them, don't worry if your drive seems a bit slower — it's not wearing out, but probably a bit fuller than before!

To give you some idea of the amount of variation, I reformatted a 2.5Gb Maxtor Diamond Max EIDE drive using FAT16, measured its sustained transfer rate, and then split it into two partitions — one of 500Mb, and the other of 2Gb — and then measured again on each. The 500Mb measured identically

Above: Here I measured a fall in sustained transfer rate of 28% when moving across the surface of the drive, by re-partitioning with different splits.

ensures that the start of the main 2Gb audio partition is only about 3% slower. It also suggests that if you partition your drive into three areas, they will give best audio performance when arranged as operating system C:, audio data D:, and other data E:.

the *Bmide_95.exe* file supplied on a floppy disk with my new motherboard, and then rebooted. As expected, CPU overhead plummeted, but still seemed unusually high at about 30%, and although read speeds improved, the write speed had dropped significantly compared with its pre-buss master value. I double-checked by running *Echo Reporter* (of which more later) on the same drive using both Windows 98 and Windows 95B, and this still showed read speeds roughly the same, but write speeds lower with Windows 95B. This may be an anomaly with my system, and I will report back if I resolve it.

Speed Utilities

There are several types of disk speed utility available, and many people have one included as part of a utility suite such as *Norton Utilities* or *Nuts & Bolts*. However, while these give a fairly repeatable figure for general purposes, they are not suitable for testing out the effects of hard disk audio tweaks, since their test file sizes are unlikely to be large enough to defeat any caching systems in place. What we need is a utility specifically designed to measure a hard drive when being used like a typical hard disk recording system. To do this you need multi-file reads to simulate the way a

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PC HARD DRIVE PERFORMANCE

► multitrack audio application has to open and read various large files (one for each running track). The most accurate results will be obtained from these utilities if you make sure that no other applications are being run at the same time.

Probably the most easily available disk test program that fits this description is the *Echo Reporter* from Event, which is freely downloadable from their web site (www.event1.com). I have downloaded this a couple of times in the last year, and it has changed slightly during that time. The latest version, 2.01, has a more thorough system analysis (the previous one couldn't examine the IRQs on some machines), and the transfer file size has increased from 32Mb to the current 128Mb. This does mean that the latest version takes four times as long to run the disk speed test, but it should make the results more accurate and repeatable.

Another one that I've found recently is *DskBench*, which can be found in the software section of www.prorec.com. It's basic and unpretentious, and needs to be run from the drive you wish to test (for multiple drives, simply copy it across to each one — it only takes up 41K). Both this and *Echo Reporter* set up eight files, long enough to defeat any caching in place (128Mb in the case of the *Echo* utility, and 16Mb for *DskBench*). However, *DskBench* has an added feature in measuring sustained transfer rate for a single file, using a huge 256Mb file read sequentially. It also carries out its multi-file tests using various block sizes varying between 128K and 4K (see later), and measures percentage CPU overhead. The downside of this is that the tests take an age to run (the first time I ran it I thought my PC had crashed), but I found its results very repeatable, which made it easy to see the result of any adjustments. If you want to terminate the tests before they get right down to the 4K block size, you can safely use the 'three-fingered salute' (Ctrl-Alt-Delete keys) and then End Task.

Repeatability

The first few times you run any utilities like this, you will probably be disappointed at the low transfer rates measured. The reason for this is that we are not measuring maximum burst rates, and not even the maximum sustained transfer rate, but more realistic figures based on reading and writing

multiple audio tracks. However, any form of sustained transfer rate can only be measured accurately if file sizes are large, so that whatever cache system is currently being used, it will soon be emptied, and the remainder of the data transfer will be directly from the drive itself, rather than from some high-speed memory buffer. The only disadvantage of this is that due to the large file sizes, tests will take longer to run (at least a few minutes), but this is the only way that you will be able to see whether the operating system tweak you have made has had the desired effect.

However, when you are using disk speed utilities, don't expect them to give exactly the same figures every time. There are so many processes going on in any computer that there will be slight variation (probably of the order of a few percent) every time you run the test. Of course, where hard disks are concerned, a heavily fragmented drive will be significantly slower than a freshly defragmented one, so you can ensure more consistent results by running a 'defragger' utility before carrying any tests, to keep the playing field as level as possible. In fact, if you are planning to try out a selection of suggested tweaks, it makes sense to do them all in the space of a few hours. If you start by fully defragmenting your drive, and then carry out the adjustments one after the other, you will minimise the chances of anything else changing in the meantime, and then you should see the results of your tweaks more easily.

Splitting The Load

I've already mentioned that to simulate using a hard drive for multitrack audio, utility programs need to open multiple files and read them using streaming. This simply means that a small chunk of each file is read in turn and stuck in a set of RAM buffers, which then hold enough audio data to keep the soundcard going until the next batch of reads occur. As long as the buffers are big enough to ensure that the file reads stay ahead, audio playback should never stutter or glitch.

Now we finally come to the big difference between those impressive sustained transfer rates, and the reality of multitrack audio. Each time the drive read heads move from one track chunk to the next it takes some extra seek time, and this appreciably increases the total time taken. The

“Don't expect disk speed utilities to give exactly the same figures every time. There are so many processes going on in any computer that there will be slight variation every time you run the test.”

Putting My Money Where My Mouth Is

As I reported in last month's PC Notes, I have just bought a new, faster and more powerful PC, complete with a 300MHz Pentium II processor, and a separate SCSI hard drive specifically for hard disk audio recording specifically chosen for its low acoustic noise. When buying a system, everybody's needs will be different, but it is worth briefly explaining my rationale. I chose a 300MHz Pentium II as the best value for money at the time of purchase, but although this works with a 66MHz front-side buss (see September's PC Notes), I specified a motherboard with one of the new 440BX chipsets which supports the new 100MHz buss speed. I also requested 64Mb of 100MHz-capable SDRAM, with the result that as

and when future requirements and funds permit, I can simply upgrade to a 450MHz Pentium II processor, without having to change any other components.

My hard drive requirements are fairly modest (I'm ruthless about purging unwanted software, and don't indulge in games), and so chose a 2Gb EIDE drive for installing my operating system and applications. I chose Windows 98 to research last month's PC Musician feature, but also transferred across the 2.5Gb EIDE hard drive from my previous PC, and installed Windows 95 on this. Rather than use dual-booting software, I find the easiest way to swap between them is to enter the BIOS during bootup, and change the entry for my Windows 98 C: drive to 'None'. Then my

second drive automatically becomes the C: drive, and boots up into Windows 95 instead. I intend using this for compatibility testing, as well as for reviewing software and hardware that is only on my machine a short time, so that it can be purged regularly. This may seem a bit of a waste of a 2.5Gb drive, until I explain that I've partitioned it as 0.5Gb (500Mb) for the Windows 95 operating system, leaving me with another 2Gb partition for more general storage.

My main audio drive is a Fujitsu MAC3045, an Ultra Wide 4.5Gb SCSI device that spins at 10,000rpm but still remains blissfully quiet compared to many others. This may not seem very large for audio, but still provides enough space for 106 minutes of continuous 8-track recording, or 53 minutes of 16-track — fine for my purposes.

PC HARD DRIVE PERFORMANCE

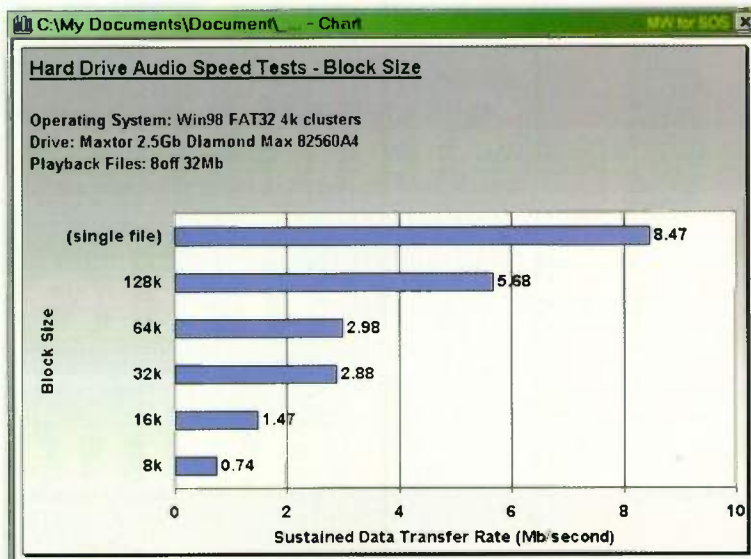
▶ amount of extra time taken depends on how often the next set of chunks is required, and this is directly related to the size of the chunks we use. Anyone who uses *Cubase* may already get the feeling that they know what's coming next — yes, this is the Disk Block Buffer Size that you can set in the Audio System window. Not all audio software provides user adjustments for this setting (*Cubase Audio 6* apparently fixes it at 12K, but there are ways to increase this), but if you understand the reasoning behind this value, you should be able to investigate and optimise whatever parameters are available in your software Preferences or Setup windows.

Echo Reporter uses a fixed 32K block size, but *DskBench* carries out its 8-track playback test with a set of different block sizes: 128K, 64K, 32K, 16K, 8K, and 4K (see the top graph on the right). Once you have studied these figures, you will realise why being able to change the block size can make a huge difference to the maximum possible number of playback channels (the associated values for this are shown in the lower graph to the right). It also explains why so many people tend to be disappointed with the figures that *Echo Reporter* reports for their drive. They are not sustained transfer rates, but simulated real-world figures for eight-track audio recording — which can then be extrapolated for different numbers of channels after the test. Hopefully this finally explains the huge variations in results using different drive speed checks, and why the only really valid ones for multitrack audio are those that use large file sizes (to overcome the effect of any caching and measure sustained transfer rates) and multiple streamed file reads, to include the read/write head seek time.

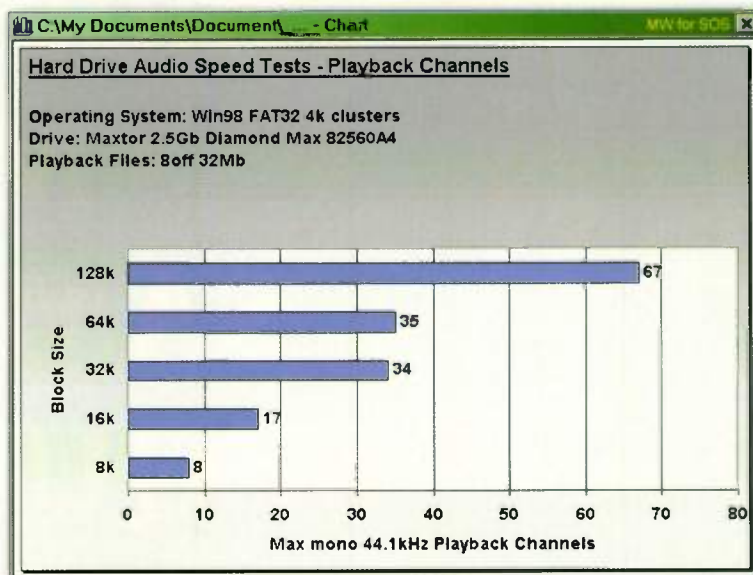
Summary

Of course, nothing in life is free, and the larger the block size used for each audio channel, the more RAM will be used for buffering. For a chosen number of audio channels you may find that beyond a certain point, increasing the block size uses more RAM than is sensible. For instance, *Cubase VST* allows block sizes of 32, 48, 64, 96, 128, and 256K, but with minimum memory per channel of 96, 144, 192, 288, 384, and 768K. If you foolishly set a 256K block size, and try for 32 channels, you will use 24Mb of RAM for the buffers alone. With a more sensible 64K (the default size), 32 channels will take only 6Mb for RAM buffers.


As you can see from the lower graph on this page, even with a 32K block size, my old Maxtor Diamond Max drive should manage the maximum of 32 mono 44.1kHz 16-bit tracks available in *Cubase VST*. In fact, 32 channels will take 88200 (44.1kHz 16-bits) times 32, which is 2.69Mb/second. So why are we all buying such fast drives for hard disk audio? Well, *Cubase* offers



There is a huge difference in Transfer Rate when reading multiple files, depending on the size of the Blocks that are read from each file in turn. Incidentally, the 64k figure does look low, but it was checked several times.



up to 32 mono or stereo tracks, and stereo instantly doubles the requirement to 5.38Mb/second. Even my new Ultra Wide SCSI drive only just scrapes through this requirement with a 64K block size, although its sustained transfer rate is about 15Mb/second. In addition, given the huge drop in drive transfer rates when reading multiple tracks, there will be inevitable extra overheads when you stop measuring with a neat single long file for each track, and enter the real world with lots of smaller track sections dropping in and out, and the inevitable few bits of file fragmentation, as well as little hiccups caused by the operating system. As soon as you attempt to record several tracks at the same time, the figures will drop even further.

The important thing is to measure the performance of your own drives, and find out the current figure for block size used by your MIDI + Audio sequencer — this should finally give you a realistic number of achievable tracks. Happy testing! 

The different transfer rates determine the likely maximum number of playback channels — the bigger the block size, the more channels the same drive is likely to achieve.

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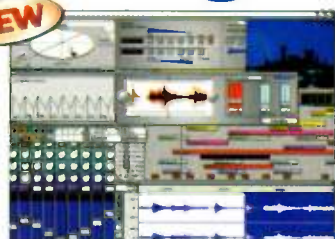
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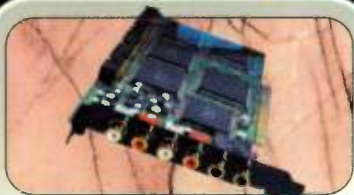
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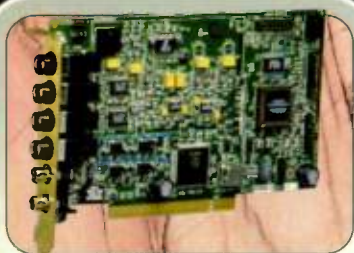
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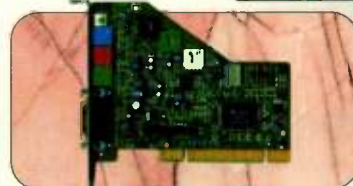
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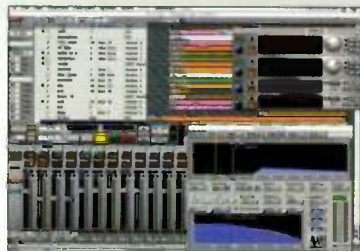
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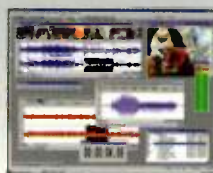


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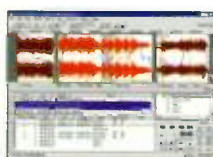


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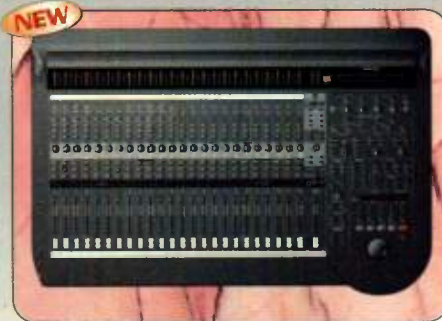
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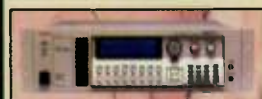
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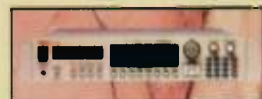
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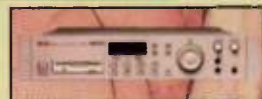


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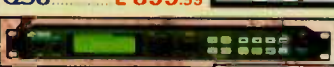
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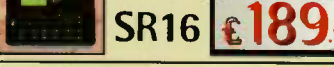
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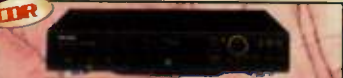


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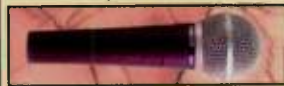
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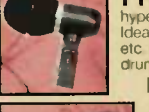


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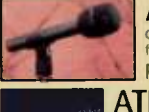
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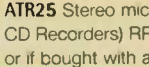
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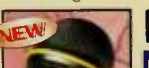
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MACKIE HUI

human interest

MACKIE HUI CONTROL SURFACE FOR
DIGITAL AUDIO WORKSTATIONS

Mackie's new Human User Interface, first previewed in *SOS* January '98, was designed to offer a hardware interface for software-driven digital audio workstations. Digidesign's *Pro Tools* 4.1 software is the first to support the device, although Mackie intend that other DAWs will eventually also be able to work with the HUI. So what is HUI for? Well, as most *SOS* readers will know, *Pro Tools*' onscreen mixer is normally controlled using your computer's mouse. The problem, however, is that a mouse is far from being the ideal device for controlling a mixing console — it is difficult to drag the faders smoothly, and 'turning' knobs on screen can be awkward, to say the least. Consequently, several hardware controllers have been developed as an alternative to software front-ends over the years, including models from Penny & Giles and JL Cooper: all of these, however, offer only a limited number of

Users of computer-based recording systems often feel restricted by the limited degree of physical control available when it comes to mixing, especially when compared to a traditional setup centred around a hardware mixer. **Mike Collins** tries out a new system from Mackie which aims to improve matters.

HUI in operation
with Digidesign's
Pro Tools 24.



controls compared with the HUI, which seeks to give the operator hands-on control of virtually all of Pro Tools' mixing and editing parameters, as well as a full set of transport and locator controls.

At first glance, the control surface looks rather like a compact digital mixer, with eight assignable faders, associated Select switches, and an electronic 'scribble strip' which picks up the channel names from your Pro Tools project and displays these handily above the faders. This feature alone won my instant approval! The faders are motorised so they move to reflect automatically the positions of Pro Tools' onscreen faders. The HUI also has a built-in meter bridge with eight pairs of dual LED 'ladders'. With mono Pro Tools tracks, only the left LED 'ladder' lights up, while both are used with stereo channels. Having these meters just where you need them is great, especially if you are using the ADAT Bridge interface, for instance, which, unlike Digidesign's 888 I/O hardware, doesn't have any meters.

For the project studio operator, however, the biggest deal with the HUI may well be that it gives you many of the extra facilities you need to run your Pro Tools system without using an external mixer. With a conventional Pro Tools setup, despite the host of mixing facilities on hand, an external mixer is normally still required in order to provide microphone inputs (the Digidesign I/O interfaces only operate at line level), and to control monitor feeds and headphone foldback mixes for musicians performing overdubs. Additionally, an external mixer will usually be the only means of creating a talkback facility for the engineer/producer to communicate with the musicians in the studio area. The HUI, however, effectively caters for all these basic requirements within its control room section which offers

three stereo inputs and three stereo outputs, plus a headphone output, as well as two high-quality microphone preamplifiers which can provide line-level feeds into the analogue inputs on an 888 or 882 I/O interface. These mic preamps are similar to those found on Mackie's professional analogue mixers and have plenty of gain, insert patching and phantom power for condenser mics. A third mic preamplifier is available which is intended for use with a remote talkback mic.

The three stereo inputs can be used in a variety of ways — for example, you might just have one stereo pair of outputs from Pro Tools and use the other two pairs to connect a CD player and a cassette or DAT recorder.

Connecting the control side of HUI to the Pro Tools system requires only a couple of MIDI cables running to and from your MIDI interface. If you are using OMS, your system configuration also needs to include the device settings for the HUI. The Pro Tools software has a HUI 'personality' file which can be selected in the Peripherals dialogue — as soon as HUI is selected as a peripheral, the Pro Tools software will start communicating with HUI, which will immediately display timecode if everything is hooked up correctly.

Getting Into The Details

Each channel strip has a 100mm, touch-sensitive motorised fader which can be assigned to control channel level, aux return level, MIDI track level or master fader level. Above each fader is a channel select switch to use when assigning groups and so forth, and a 4-character LED display where you can display the channel's name, group status, input and output source, send and insert status, or pre/post status for sends. Three buttons above this are provided for muting, soloing and enabling automation, below a Pan/Send 'V-Pot' and an associated selection switch which can also be used to choose items from scrollable I/O assignment lists or to choose send destinations. 'V-Pot' is Mackie's jargon for 'virtual potentiometer' — a name chosen to reflect the fact that these pots can perform different functions depending on the software being used with the HUI, a sensible idea given that Mackie's intention is that the HUI will control other software packages in the future.

To the left of the channel strips are several groupings of buttons. From the bottom up, the first group of eight buttons lets you control a number of frequently used keyboard commands, such as Command, Shift, Undo and Save. Above this, six buttons are provided to let you select the various windows in Pro Tools —

MACKIE HUI £3171

pros

- Makes Pro Tools much easier to use, giving you real hardware controls and faders.
- Could mean you don't need another mixer.
- Flexible monitoring options.

cons

- You'll still need lots of DSP to perform complex mixes in Pro Tools.

summary

The HUI really unlocks the power of Pro Tools' integrated mixing capabilities, but costs as much as some fully-featured digital mixers.

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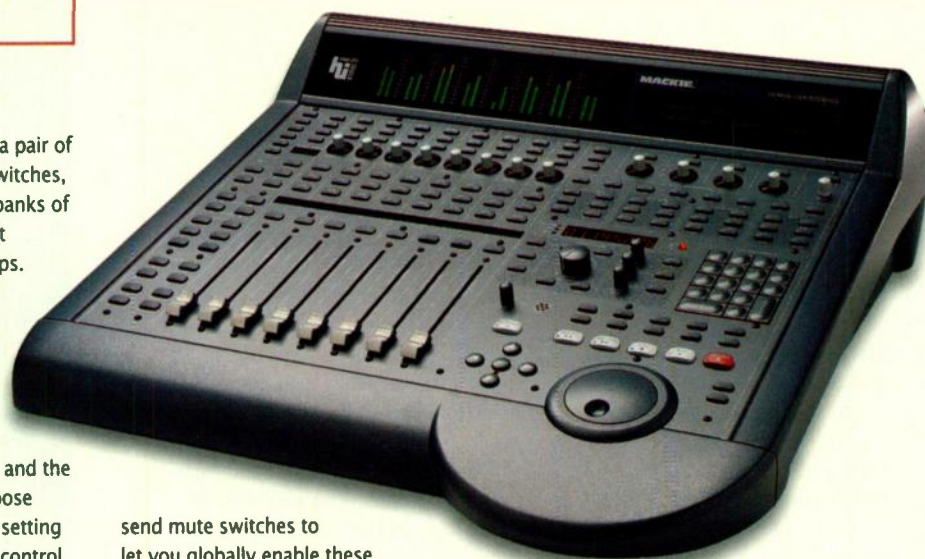
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MACKIE HUI

► Edit, Mix, Transport and so forth. Next up is a pair of channel switches and a pair of bank select switches, which you can use to bring single faders or banks of eight faders (if you are using more than eight channels in Pro Tools) up on the channel strips. The top group of control switches includes the input/output assign switches, a Suspend switch which lets you temporarily disable the automation globally (a neat idea), a Default switch which lets you set selected channels back to their original settings (another neat idea!), and the Select/Assign switches which you use to choose what a track's V-Pot will control. The default setting is Pan, but you can also assign the V-Pots to control any of up to five auxiliary sends, Mute or Shift. The last couple of switches at the top are for Record/Ready toggling (ie. to enable or disable all the tracks for recording) and for Bypass (which lets you bypass any channel inserts, whether hardware or DSP plug-ins, on any selected channels).

To the right of the channel strips are five main groupings of controls — the DSP Edit/Assign section, the Switch Matrix section, the Control Room section, the Talkback section and the Transport section. The DSP Edit/Assign block is at the top right, and sits beneath a 40-character, two-line fluorescent display which shows up to four plug-ins or up to eight plug-in parameters, and is also used to display general HUI text information. The DSP Edit/Assign controls include an Assign switch which allocates plug-ins to channel strips, a Compare button which lets you compare the current DSP parameter setting with the previous one, and a Bypass switch to disable the plug-in parameters or any plug-in assigned to the channel, as applicable. The Insert/Parameter switch lets you toggle the display between the plug-in assigned to a particular insert and the plug-in parameters for editing. A rotary Scroll control is used in conjunction with this, either to toggle the display between Inserts 1-4 and Insert 5, or to scroll through control parameter pages for the currently active plug-in. There are also four assignable rotary controls with associated Select switches, which you use to assign plug-ins and edit plug-in parameters corresponding to the HUI display and Pro Tools software screen displays.

The Switch Matrix section contains controls for global information enabling, mode selection, group creation and so forth. There are eight Function (F) keys which let you access special HUI features. F1 clears clip and peak holds from the meter; F2 activates Relay Outputs 1 and 2 which let you remotely control Play and Record functions on other equipment using HUI's Play and Record buttons; F3 lets you disable the audible click function for the V-Pots below the fluorescent display; F4 displays the version number of the HUI 'personality' file currently installed in the host computer; F5, 6 and 7 are reserved for future expansion, and F8 acts as an escape switch to cancel any assignment mode or onscreen dialogue. Underneath the F-keys are four groups of switches. The first group, labelled Auto Enable, includes fader, mute, pan, send, plug-in and



send mute switches to let you globally enable these functions. The next group of switches, labelled Auto Mode, lets you enable, disable, record or edit automation on individual channels or channel groups. Options include Read, Touch, Latch, Write, Trim and Off. Next are the Status/Group switches which are used to query automation, monitor and group status, and to create or change groups. The last group of controls lets you perform standard editing functions including Capture, Separate, Cut, Copy, Paste and Delete. Below these is a display which shows the current time location in timecode, feet or beats, or simply in minutes and seconds, and to the right of this you will find a numeric keypad which can be used to control the locate feature.

Underneath the timecode display, the Control Room section lets you control your input and output sources and the Master Volume. The input source switches choose between monitor inputs 1, 2 and 3, and a Mono button is also provided to sum all the signals via the Master Volume control. There are individual output level controls for the three stereo output pairs, along with switches to mute them individually or simultaneously, and a Dim switch is provided which lowers the monitor output level by a set amount, the default being 20dB. Below these controls is a talkback enable switch and an associated talkback level control, along with the built-in talkback mic.

Finally, the Transport controls are situated at the lower right of the control surface. Large buttons let you control Pro Tools' Rewind, Fast Forward, Stop, Play and Record functions, and switches are provided to let you set the In and Out points for punch-ins, audition the section you've selected, and set the Pre- and Post-roll amounts before and after the punch-in. Another row of switches is provided to let you Return to zero, go to the End, put Pro Tools Online, engage Loop playback, or enable the Quickpunch feature. A further set of four switches is available to let you navigate, zoom, and make selections in the waveform display — an associated mode switch lets you choose whether these switches will act as horizontal/vertical view expanders/contractors or whether they can be used to locate the cursor, as an alternative to using the tab and arrow keys on your computer keyboard. There is also a large jog wheel with a pair of associated buttons to switch this between Scrub and Shuttle modes.

“Whether you use it on its own or with another mixer, the HUI hardware controller undoubtedly makes a superb partner for the Pro Tools system.”

Demo Mode

Like most hi-tech studio equipment, the HUI has a self-demo mode which runs through the features while displaying explanatory comments. The meters light up in bright red, green and yellow; the faders whizz around; then the buttons light up while their functions are described in the display. Finally, at the end of the demo, the display cheekily announces “I need a nice home with someone like you. Won't you buy me please!”

Rear Panel

On the back panel is a standard IEC connector next to a power on/off switch. To the right of these is a pair of MIDI sockets and two pairs of Apple Desktop Buss connectors, to let you feed your computer's mouse and keyboard connectors via the HUI. A couple of 9-pin connectors are provided to allow connection to other external devices, one of which is switchable between RS232 and RS422 operation. A pair of quarter-inch jack sockets is provided for footswitches to control functions such as play or record. Six quarter-inch jacks feed balanced or unbalanced line-level signals into the monitor section, and another six quarter-inch jacks provide balanced or unbalanced line-level outputs for monitoring or other purposes. Beneath these is a single stereo headphone output jack.

At the far right of the rear panel are three microphone input channels, all with XLR sockets, +48V phantom powering and trim controls to cater for a wide (60dB) range of input signals. The first of these is intended for use with an external talkback microphone, and a 'trigger' jack input/output is also provided for activating the HUI's talkback function remotely from another console, or using a footswitch. The other two input channels are intended for microphones or instruments that you wish to record into Pro Tools. Both of these have quarter-inch TRS insert points so you can connect signal processors such as compressors across the



channels. Each of these two mic channels also has a quarter-inch jack socket which will normally be used to let you feed unbalanced or balanced signals to a Pro Tools interface. The microphone preamplifiers are definitely up to Mackie's usual high standard, and provide an excellent way of connecting low-level signals to a Pro Tools 888 interface.

Monitoring

The HUI's monitoring facilities are particularly flexible, supporting up to six discrete channels of surround sound — in stereo monitor mode, with the Discrete switch turned off, any of the three stereo input sources can feed any of the three stereo output pairs, and all the outputs can be active at once, so you could send outputs to various combinations of monitor speakers or to external recorders such as cassette machines. Keep in mind, however, that these outputs are designed for monitoring purposes only — not for mixing. When the Discrete switch is

engaged, the control room section becomes a discrete surround matrix capable of either standard 4.1 (L/C/R/S plus subwoofer) or 5.1 (L/LS/C/R/RS plus subwoofer) surround operation. With this setup, you can connect up to three pairs of stereo 'stem' outputs from the Pro Tools audio interface to the HUI's monitor inputs and feed these to the three output pairs, whereupon the level controls for the three HUI outputs can be used to trim the output levels of the respective mix stems. These surround monitoring features make the HUI particularly suited to post-production work for video or DVD which increasingly use surround formats.

The Bottom Line

There is no comparison between using a mouse to control Pro Tools and using the HUI; with the latter, everything simply works so much more efficiently. The jog wheel is much smoother in action, the faders feel much better, and if you want to hit a Solo or Mute you just have to reach out and touch the button! Also, being able to see plug-ins' parameters displayed numerically and control them using the V-Pots lets you run your session much more effectively than when you have to mouse around the graphical plug-in displays on the Mac screen.

Whether or not I would be prepared to recommend using a 'HUI Pro Tools' without an external mixer of any kind would largely depend on what kind of work it was expected to do. With the latest Pro Tools MixPlus system, which has much more DSP available for plug-ins, or with an expanded Pro Tools system with plenty of extra DSP Farms, you can now have enough signal processing available to make very sophisticated and ambitious mixes with Pro Tools alone. And if you only need to record or overdub instruments in mono or stereo, then the pair of mic preamps in the HUI should be fine.

My own setup, however, consists of a standard Pro Tools 24 system with just one DSP Farm, and will only let me use one plug-in, or just a few EQs or compressors, when I have 32 tracks of audio in a mix session — nowhere near enough signal processing for a decent mix. Consequently, I normally use my Pro Tools alongside a Yamaha 02R mixer, with 16 separate outputs connected to the 02R's 16 'tape' returns. This allows me to EQ, compress or add reverb or delay effects from the 02R without needing to use plug-ins. I also do some recording and overdubbing, and can occasionally need to record up to four or more instruments at once. However, if my work was mostly post-production and editing, with only occasional overdubs using just one or two mics, then I think the HUI certainly could be said to offer a viable alternative to using an additional external mixer, provided that you have sufficient DSP in the system to cater for all your mixing requirements. But whether you use it on its own or with another mixer, the HUI hardware controller undoubtedly makes a superb partner for the Pro Tools system, making the system significantly easier to operate for both the project music studio and the smaller post-production studio working with surround sound. **ES**

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ENSONIQ ASRX PRO

colourful pros

It's been about 18 months since the release of the original Ensoniq ASRX Advanced Sampler/Resampler, and it has gained a dedicated following, if not a particularly high profile. This new version, renamed the ASRX Pro Resampling Production Studio, includes a few brand-new features and improves on some of the original's shortcomings — the 'New ASRX Pro Features And Improvements' box contains a list of the major changes. For a full operational rundown of the original ASRX you'll need to read my earlier review (*SOS* September '97), or take a look at the list of features common to both the ASRX and ASRX Pro in the 'Common Features' box.

Devil In A Red Dress

The most immediately obvious difference is the matt-finish flame-red case, which is actually a pleasant change from the original black and makes reading the function buttons slightly easier, though for some reason Ensoniq still insist on using a very small point size and a hard-to-read colour for many of the button names. Housed in the same type of slightly industrial-looking steel case as its predecessor, the ASRX Pro is robust enough for gigging and heavy enough to survive the occasional drop by a careless roadie.

Physically, the ASRX Pro is about 90 percent as the original; as well as having the same case, it has the same knobs, pads, floppy disk, display and audio and MIDI connections. The most notable difference (apart from the colour) is the introduction of 10 new Essentials buttons below the LCD, where the Track edit buttons used to be, and the consequent rearrangement of the left-hand button bank to include the ousted Track buttons.

Essential!

The Essentials buttons allow instant access to 15 of your favourite sounds, patches or drum kits (five are called up by pressing the top and bottom buttons simultaneously). This is a very useful feature, particularly as favourite setups can be saved to flash RAM, floppy or hard disk with any songs, sequences or projects you may be working on. The Essentials buttons are also used as a numeric keypad for quickly accessing patterns and tracks when in Sequencer mode.

The rearrangement of the access buttons for Disk, Effects, Tracks and Pads into a block (on the left) is more logical and makes finding your way around while editing slightly easier, though there are still no dedicated cursor buttons, and new

ENSONIQ ASRX PRO RESAMPLING PRODUCTION STUDIO

The ASRX, Ensoniq's entry into the world of all-in-one sampling and sequencing workstations, has just received a major upgrade and a fresh lick of paint. **Chris Carter** finds out whether the improvements justify its new 'Pro' label.

users may find navigating the endless editing screens confusing using just function buttons and the Parameter and Value knobs.

Scuzzy Too

A SCSI 2 interface (a 50-way, half pitch 'D' type socket) is now included as standard, rather than as an expensive optional extra. The ASRX Pro can read Ensoniq ASR10 and EPS, Roland S770 and Akai S1000/1100 sample data over SCSI, but not program data or Akai S3000 data. Support is also included for reading standard ISO-9660 CD-ROMs containing Mac AIFF and PC WAV files. The SCSI interface also includes improved compatibility with most hard drives and removable media, including Zip and 3.5-inch optical. The Ensoniq web site includes a list of compatible drives.

More RAM, Vicar?

The old limit of only 34Mb of RAM has been almost doubled to 66Mb. This is a more realistic figure for general sampling use, but could still be considered on the low side for some of the sampling *and* resampling tasks to which the ASRX Pro is otherwise ideally suited. The ASRX Pro is a RAM-based dedicated workstation, and is very adept at fast 'on-the-fly' resampling of songs and musical ideas (from samples, ROM sounds, effects, sequences and so on) — unlike a software/hardware combination such as a computer running *Cubase VST*, which writes directly to hard disk when recording/sampling. So, because of its speed and ease of use, the ASRX Pro makes an ideal tool for remixing dance tracks, which can often involve sampling entire stereo mixes, spinning in sampled loops, breaks and sequences, resampling the whole lot, and so on. Add together all this RAM-based activity (simultaneous sample playback and resampling), however, and you begin to see what sort of strain

ENSONIQ ASRX PRO

£1499

pros

- Top-notch audio quality.
- SCSI 2 interface included.
- Flash RAM for system settings and easier OS upgrading.
- Essentials buttons speed up patch access.
- Increased RAM capacity.

cons

- Expensive, given the current low price of the original.
- No new ROM sounds or effects.
- Still only 2Mb RAM as standard.
- Stomper may disappoint.
- Inadequate display.
- No digital input/output option.

summary

The ASRX Pro excels at fast and easy sampling/resampling and song construction, and the quality of sound can't be faulted. Though Ensoniq haven't addressed all of the ASRX's flaws, the new additions and improvements are welcome and improve its versatility. A Pro upgrade for pro musicians — but at a pro price.

SOUND ON SOUND



could be put on 66Mb of RAM. Hopefully this limit can be increased with the next software revision.

Long Time Scale

Two new compositional features are Pattern Mode, for cueing sequencer patterns and triggering them in real time, and Song Mode for chaining sequences together by creating a playlist of up to

200 steps per song from 128 sequences. Both of these additions work well, particularly Pattern Mode, which is great for trying out different song structures and live jamming or improvising.

A welcome addition to the sample wave edit menu is time stretching, or 'Scale Time?' as Ensoniq call it. Only two parameters are available — Amount (50-1000%) and Quality (Low, Medium, High). Using the High quality setting retains the sound integrity impressively. In fact, time-stretching on the ASRX Pro is probably the best I have heard outside a computer environment, with very few digital artifacts at the best setting. However, the length of time taken to process even a short mono sample is unbelievable — we're talking Atari ST speed, definitely not Pentium or G3. As an example, a 2.5-second stereo loop stretched to twice its length (200%) took an incredible 46 minutes and 42 seconds to process, long enough to enjoy a leisurely walk to the shops and back — and there's no way to stop or exit the procedure once it's underway, other than turning the machine off.

Stomper

The new Stomper option is a non-real-time subtractive synthesis algorithm (created by independent programmer Hakan Andersson) which

New ASRX Pro Features & Improvements

The major new ASRX Pro features are not available as an upgrade to existing ASRX owners, owing to the obvious (and not so obvious) hardware changes. However, a new upgrade (OS v2.62) has recently been announced for current ASRX owners, giving them some of the benefits of the new machine. These are marked below with an asterisk.

Other than a small handling charge, the upgrade is free, and details of how to obtain it are available on the Ensoniq web site or from your local Ensoniq dealer.

The main new features and improvements implemented in the ASRX Pro are:

- OS and system settings stored in Flash memory.
- Sample RAM expandable to 66Mb.
- Built-in SCSI 2 connector and Improved SCSI support.
- 10 dedicated 'Essentials' patch recall buttons.
- Built-in 'Stomper' synthesis program.
- Improved tempo resolution (within 0.01 bpm).
- Improved hard disk compatibility.
- Sample time-stretch/compression.
- New Song Mode.
- New Pattern Mode.
- Input quantise.
- SCSI Disk copy/optimize.
- SCSI support for ISO-9660 CD-ROMs containing AIFF and WAV files.
- SMIDI transfer support (MIDI via SCSI).
- Faster ASR10 loading.
- Selectable MIDI out (play external MIDI from internal sequencer).

ENSONIQ ASRX PRO

- ▶ allows you to make your own 'vintage-synth-style' (sic) samples from scratch. Each sound can contain up to four oscillators (each using sine, square or saw waves) and/or low-pass filters. The sound is constructed using 12 parameters per oscillator and four parameters per filter, with familiar (and unfamiliar) parameter names such as: Waveform, Noise Factor, Start Freq, Amp Curve, FreqCurveShape, Start Cutoff and End Resonance. By adjusting these values you can build up a sound, or use one of six preset drum templates as a starting block. When you've entered all the parameters (which can be 40 or more), you press the Enter button and sit back and wait for it to be processed into a sample.

To be honest, I found Stomper a disappointment. Having previously seen the Stomper web site, I suppose I was expecting more than the ASRX Pro can realistically offer in terms of processing power and visual feedback. Part of the problem lies in the fact that Stomper is based on a Windows PC program using a graphical interface, which usually runs under the wing of a Pentium processor.

Maybe I'm missing the point somewhere, but blindly inputting numbers (none of this can be done in real-time, remember) and watching a progress bar for two to three minutes, waiting to hear often unpredictable results, removes any spontaneity from the process, and is about as uncreative as it gets. Admittedly, it can sometimes produce interesting grungy/vintage sounds, but Ensoniq need to include more preset templates (only six drums, no matter how good they sound, is insultingly few), some better documentation — and what about some example settings to point users in the right direction, or some examples on floppy disk? It also bothers me that Stomper is at odds with the rest of the ASRX Pro, which is so fast and easy to use. If Ensoniq could make programming Stomper more visual *and* speed up



the rendering process it would be a useful addition to the ASRX Pro, but in the meantime my advice is to buy a decent sample CD of analogue sounds and use the Pro's superior and faster sampling capabilities to achieve quicker and more predictable results.

The Pro's Pros

I hope this review doesn't appear too negative because, slight operational challenges aside, I am quite an admirer of the ASRX and now the ASRX Pro. It's well built, and offers outstanding sound quality, fast sampling and resampling, top-notch multi-effects and reverbs, a very well-specified MIDI sequencer and MIDI spec, decent-sized velocity-sensitive pads, easy song construction and relatively straightforward editing.

Nothing moves quite as fast as technology, however, and the sampler/workstation market is no exception — so the ASRX Pro comes across as a little dated (notably in its internal ROM sounds, which are the same as those of the original ASRX) and not quite the state-of-the-art upgrade it could have (and should have) been at this price. One of the most frustrating aspects of the original ASRX was the pitifully small display, and using this hasn't been improved by including yet more editing options to navigate in the Pro version. I imagine this is why Ensoniq have included 10 new function buttons, but a more detailed display would have been far more useful on an instrument of this complexity. It's also a shame that there's still no digital I/O option.

Watch PC Users Weep

But hey, let's not dwell too much on the minus points, because there's no denying that this is a very professional tool. I don't think I've ever used another sampler/synth/sequencer setup that's as fast, stable and easy to bash out ideas on (literally) as the ASRX Pro — you don't even need a MIDI keyboard! Familiarity is everything, and once you've sussed your way around its inner workings you'll be the envy of PC users everywhere, because while they're struggling to record and sample using buggy convoluted software, you'll be sampling, resampling, composing and laying down tracks in the blink of an eye. It's probably not the best choice for beginners or dabblers, but if you are serious about making music in the studio or on stage, and think you can live with the ASRX Pro's idiosyncrasies, I can recommend it to you. At £1499, however, it might be considered somewhat overpriced compared to the current knockdown price of £750 for the original, soon-to-be-discontinued ASRX — which, with the new software upgrade, is almost a match for the Pro. Think carefully before you decide which one to go for, but either way, I doubt you'll be disappointed. **SOS**

The rear panel now with SCSI as standard.

Expansion Options

- X-8 Audio Output Expander £166 including VAT.
- RAM expandable to 66Mb (using standard 5V EDO/non-EDO SIMMs).

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Sampling Times

With the standard 2Mb RAM fitted, the ASRX Pro offers 15 seconds' mono sampling (7.5 seconds stereo). With more memory, the mono sampling time available increases as follows:

18Mb	202 seconds.
34Mb	392 seconds.
66Mb	773 seconds.

Common Features

Features Common To Both ASRX And ASRX Pro:

- Stereo Sampling/Resampling (44.1kHz sample rate).
- MR Synthesiser (128 preset ROM voices, expandable).
- 16 track polyphonic MIDI sequencer.
- 128 sequences (ASRX: 40,000 notes, ASRX Pro: 70,000 notes).
- 32-note polyphony.
- 16-part multitimbrality.
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information

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Craig Anderton, EQ Magazine - January 1998

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Gary Escow, MIX Magazine - May 1998

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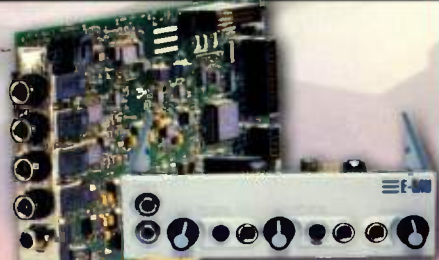
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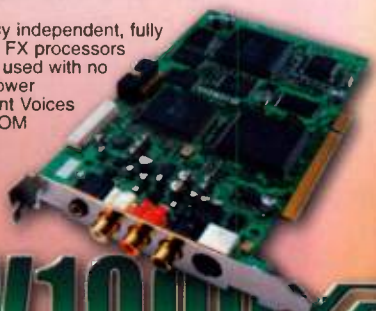
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good vibrations

Derek Johnson and Debbie Poyser explore a well-specified virtual monosynth from newcomers Koblo.

Good stuff seems to come out of Scandinavia: IKEA, The Cardigans, Propellerheads (creators of the superb *Rebirth RB338*), the Nobel Prize, Pippi Longstocking, Abba, TC Electronic (makers of top-quality signal processors such as the Finaliser and the Fireworx), Hedy Lamarr, The Moomins, Clavia (source of the excellent Nord series of virtual analogue synths), Ingmar Bergman, *Ingrid Bergman*... and now *Vibra 9000*.

Danish company Koblo are hoping to add an extra sheen to Scandinavia's hi-tech music reputation with their small family of software synthesizers. *Vibra 9000*, a monophonic virtual analogue synth, is currently top of the Koble heap, but the company have ambitious plans for the future. Their two founders, Emil Tin and Max Granlund, started out by spending three years developing a "visual real-time programming language", called Tokyo. It's Tokyo which has provided the basis for development of the *Vibra* family of software synths, and the language/operating system itself will be released next year for other developers to use. Other Koble planned products include drum and percussion synths, sampling and hard disk playback synths, mixing consoles, effects processors, multitrack hard disk recorders, testing and measuring instruments, and step and pattern-based MIDI sequencers — all in software, of course, and all running within the Tokyo operating system. Meanwhile, *Vibra 9000* is in constant development and is currently standing at v1.5.1.

Green Screen

Vibra 9000 makes an impression the second it appears on the Mac's screen (it won't be appearing on PC screens until early 1999). The reason should be clear from the accompanying screenshot: it's luminously green, with touches of high-contrast red and white here and there. The graphics are sculptured, the knobs look like little green frogs' eyes, and the result is very individual and rather cool, which is always a bonus with software.

The *really* important thing, though, is the spec, and as a monosynth *Vibra 9000* doesn't disappoint. It's a two-oscillator job, with a multi-mode filter section, three envelope generators, two LFOs, an arpeggiator, and, of

KOBLO VIBRA 9000 SOFTWARE SYNTH FOR APPLE MACINTOSH



course, a full MIDI spec. *Vibra 9000* can be played and controlled remotely by MIDI hardware or software, using OMS (the Opcode-developed Open Music System) as an intermediary. To interface *Vibra* with software running on your computer it's necessary to create a dedicated IAC (Inter-Application Communications) buss within OMS; this provides the control and sync pipeline to other OMS-compatible software. Programming and tweaking is done with the mouse, using the on-screen knobs and switches, and every knob responds to its own preset MIDI controller. The program is ideal for operation via a software mixer map or hardware MIDI control surface; our recent review of Kenton's new Control Freak MIDI control unit (*SOS* November 1998) used *Vibra 9000* in a step-by-step example illustrating this latter option.

Around 75 preset sounds come with the software and, obviously, the number of edits that can be saved is unlimited, which is one distinct advantage of running a computer-based synth. Though it's not immediately obvious how, *Vibra*

KOBLO VIBRA 9000 £99

pros

- Fully featured analogue-style monosynth.
- Varied and convincing sonic potential.
- Great graphic design.
- Includes arpeggiator.
- Reasonable price.

cons

- Needs fast computer for best results.
- Currently requires OMS to integrate with other software, which may not suit everyone.

summary

An excellent analogue monosynth emulation from a promising new independent software house.

SOUND ON SOUND

9000 patches can be selected over MIDI, using Program Change commands. At present, patches are numbered according to their alphabetical order, so if you save a new patch it'll upset the numbering of patches following it. Koblo are planning improvements in this area, including the provision of Bank Select commands.

Plans are also afoot to build in support for various PCI audio cards: Sound Manager support is already available, a Digidesign Direct I/O driver is being added to v1.6, and Koblo are working on Audiowerk8 support. They also plan a *Cubase VST* plug-in, which will link *Vibra 9000* to any software that supports the VST plug-in format.

A nice feature is that the software's output can be saved as an audio file in *SDII* format, so multiple arpeggiated parts, for example, could be imported into a MIDI + Audio sequencer and layered. This option could also be useful if your Mac isn't powerful enough for the software to be played via MIDI without delays. While we're on this subject, it should be pointed out that *Vibra 9000* does need a pretty powerful machine (especially to run at the same time as a sequencer). When we contacted Koblo to mention the delay we were experiencing between hitting a key on a connected MIDI keyboard and the *Vibra 9000* sound triggering, their response was that our 250MHz, 6500 Power Mac was too slow, and that the synth runs fine on a G3. According to Koblo, it's not a MIDI problem, but a Mac/Sound Manager latency problem, and they point out that once they have drivers in place for specific soundcards, latency should cease to be troublesome.

On paper, *Vibra 9000* is a stereo synth: everything is doubled — oscillators, filters, the lot — and the doubled oscillators are slightly detuned for "a fat sound". In practice, the audible result is of a wide stereo image over which the user has little control. A pan control moves the entire sound to the left or right of the stereo field, but that's it.

Going In Deep

What you see in *Vibra 9000* is pretty much what you get. All activity is conducted on one main page, which is divided into clearly-labelled sections — Osc (oscillator), Env (envelope), Filter, LFO, Modulation, Arpeggio, and Global. Let's take a look at those in more detail:

- **Osc:** each of the two oscillators has the same choice of waveforms, namely sawtooth, square, triangle, sine and noise. Each also has an Octave Range (transpose) knob to set a range of -5 to +5 octaves. From here on, the two oscillators differ, in that Oscillator 1 also features controls for Amplitude Modulation, where the pitch of Oscillator 2 modulates the amplitude of Oscillator 1, and Frequency Modulation (FM), where Oscillator 2 modulates the frequency of Oscillator 1. The result of the latter, as you might expect, sounds very 'FM', but can be driven to give quasi-ring modulation effects. Oscillator 2 has two additional controls: the first of these is a Keytrack knob, which at one extreme prevents Oscillator 2 from responding to keyboard pitch, causing it to play instead at a fixed pitch, and at the other extreme allows it to respond fully to keyboard pitch, with a range of response in between. The second control is a Semitone Offset knob that transposes Oscillator 2 by up to an octave in semitone steps. There's also an overall oscillator Mix control and a Detune control, for setting up the relative levels of oscillators and detuning them against each other.

- **Filter:** *Vibra 9000* offers five filter types (2-pole, 4-pole, 2+2-pole, self-oscillating comb filter, and second comb filter with negative feedback). There are also three filter characteristics — Low-pass, Band-pass and High-pass — which can all be used at the same time, and balanced with Amount knobs, to allow the creation of a slightly out-of-the-ordinary filter effect. Controls are provided for Cutoff Frequency, Resonance, Keytracking and Separation.

This last option comes into play when working with the 4-pole and 2+2-pole filters: each comprises two pairs of 2-pole filters, the former connected serially and the latter arranged in parallel. Both sets of filters have their own cutoff frequency; the Separation control alters the difference between the two cutoff frequencies, and can be used to create vocal-like timbres.

- **Env:** the three envelope generators are standard ADSR (Attack, Decay, Sustain, Release) types, with adjustable velocity-sensitivity for intensifying or reducing the effect of the envelope on a sound, and an inverse envelope option.

- **LFO:** two Low-Frequency Oscillators each have a choice of six waveforms (rising sawtooth, falling sawtooth, triangle, square, sine and noise) and a rate (speed) control, with an optional simple attack/decay envelope.

Vibra 6000

Vibra 6000 is a single-oscillator synth that should be even cheaper than *9000* (price yet to be finalised). The oscillator has its own EG, as does the filter, which is cut down but still pretty good, with controls for cutoff frequency, resonance and velocity-sensitivity, plus switches for high-pass, band-pass and low-pass operation (all three can be used simultaneously). The arpeggiator is identical to the *9000*'s, MIDI knob control and *SDII* export are provided, and there are Volume, Pan, Portamento and Bend Range controls. *Vibra 6000* also offers a choice of stereo or mono operation, with the mono option requiring just half the DSP load of the stereo.

Limited demos of Tokyo and the *Vibra* synths are available on the Koblo web site (www.koblo.com). You can also download the even more miniature *Vibra 1000*, which is totally free. The *1000*'s arpeggiator is the same, but its oscillator and filter are even more simple — a choice of three waveforms with octave setting and a decay parameter for the former, and just cutoff frequency, envelope amount, attack and decay knobs for the latter.



KOBLO VIBRA 9000

► **Modulation:** this is an 8-way matrix where modulation Sources — the envelope generators, LFOs and a handful of MIDI data (mod wheel, aftertouch, note and velocity) — can be assigned to Destinations such as various synth parameters and other Sources. Destinations include the amplitude of either or both oscillators and the pitch of either or both oscillators (for instant Pitch EG effects, using an EG as a Source), as well as parameters such as Pan, Filter Cutoff, Resonance and Separation, Low-pass, High-pass and Band-pass filter amounts, FM and AM values and the rates of both LFOs. The use of other Sources as Destinations allows some pretty complex cross-modulation patches — *à la* Sequential Pro 1 — to be set up.

► **Arpeggiator:** a simple control set creates quite complex arpeggiations. There are two pattern knobs: Pattern 1 controls the order of played notes in each octave transposition — rising, falling or rising/falling — and Pattern 2 controls the order of octave transposition — again, rising, falling or rising/falling. The Rhythm control selects a velocity-based rhythm pattern; there are 16 patterns, each 16 steps long, but as yet no user pattern definition. Likewise, there are 16 preset 'Slide' patterns, for TB303-like portamento effects. A Tempo control provides a range of 0-300bpm, although the arpeggiator can of course be clocked to incoming MIDI sync (set the tempo to 0 for this option), via OMS. Finally, the Range control transposes arpeggiations over up to eight octaves.

► **Global:** this section presents information on the overall status of the synth, and also hosts global Volume, Pan, Tuning, Portamento and Bend-range controls. A virtual LED display shows the value of any knob being tweaked, together with its MIDI controller number, and there's a bargraph-style output level meter.

The Vibe

Soundwise, *Vibra 9000* is more than satisfactory. It has a precise, almost clinical quality that is somewhat reminiscent of ARP's 2600 or Korg's MS20. It sounds analogue, certainly, but without the fuzzy, rounded edges of something like a Minimoog — though this isn't to say that it lacks power or depth, or the ability to sound really wild. The 100 presets are a varied set, though there's a slight leaning towards techno-flavoured sounds. On the whole they give a decent idea of what the synth can do, and many make very good starting points for your own programming. User-created patches, by the way, appear in a drop-down menu along with the factory presets. This menu is hierarchical, and presets can be grouped into folders, although the folders must, at present, be created and organised in the Finder rather than *Vibra 9000*.

While we're talking about programming, *Vibra 9000* makes it about as easy as it can be. You can see and readily tweak everything, just as on a hardware analogue, making it simple for even those with no synthesis background at all to produce effective patches — just tweak until you hear something you like. The user interface is friendly


and instantly comprehensible, the main drawback being knob-tweaking with a mouse: only one synth parameter at a time can be altered. The only way around this is to use a hardware MIDI controller box, and now that Keyfax's Phat Boy is around at a reasonable £150 this may be a possibility for more people — especially given that *Vibra 9000* costs just £99. The effect of complex, multi-parameter alterations could also be achieved by recording knob tweaks in multiple passes into a sequencer.

In general, there are few problems with the user interface. At present it's still necessary to define your MIDI input device at the start of every session, but a Preferences file due in v1.6 should remedy this problem. Some users may not like OMS, preferring a direct link to their software; this may happen, but depends on input from developers of other software. The version reviewed also couldn't save output as an *SDII* file — this was working fine in v1.3, but has gone AWOL in v1.5. According to Koblo, the facility is back on line in v1.6.

Playability is a nebulous concept: in the real world of hardware synths, it centres on such intangibles as the 'feel' of a keyboard, the responsiveness of control knobs, and so on. Here in the software world it's not such an issue, since the virtual *Vibra 9000* is played from your main MIDI synth, and knobs tweaked via mouse or hardware MIDI controller. However, the sluggishness of the software's response on slower Power Macs may be infuriating for some — definitely a point against on the playability front. Recording a *Vibra 9000* part into a sequencer reveals the latency (especially when the part is being arpeggiated), but it can be remedied inside the sequencer by simply moving the whole *Vibra 9000* track backwards until the notes play in sync with the rest of the sequence.

Wherever they appear, arpeggiators are fun, and *Vibra 9000's* is excellent, though it would have been nice to see some way of latching an arpeggiation and then transposing the result from the attached MIDI keyboard, in a similar fashion to Roland's SH101 and many other analogue synths. Koblo are apparently planning to add this feature to a future update. There is a 'Trigger' button in the global section, but this merely sends out a continuous middle C (great to have for testing sounds during programming, though).

Conclusion

Commercial software synthesis is still in its infancy, but is making great leaps with the increasing availability of powerful, fast computers. *Vibra 9000*, strictly speaking, is not the most comprehensive of the current crop of Mac-based software synths; that status would probably have to go to the polyphonic, multitimbral Bitheadz *Retro AS1*, reviewed in November's *SOS*, which also features built-in effects. However, *Vibra 9000* is certainly among the hippest and most fun, reminiscent in some ways of *Rebirth RB338* — and it's around two-thirds the price of the *AS1*. It's a recipe for success, and should help Koblo to bring home the (Danish) bacon. 

Other Mac Software Synths

- Bitheadz *Retro AS1*: £150. Contact Turnkey +44 (0)171 379 5148.
- *Syd*, by Jim Bumgardner: Freeware. Go to www.jbum.com/jbum/ or www.harmony-central.com/Software/Mac/
- Integral Productions *OutOfPhase*: Freeware. Go to www.harmony-central.com/Software/Mac/
- *Grainwave 2*, by Michael Berry: US\$40 shareware. Go to www.harmony-central.com/Software/Mac/
- Steinberg *ReBirth RB338*: £149. Contact Arbitr +44 (0)181 202 1199.

"Vibra 9000 makes an impression the second it appears on the Mac's screen."

System Requirements

Koblo specify a Power Mac running at 100MHz or higher with Mac OS 7.6.1 or higher, and OMS. However, as mentioned in the main text, our 250MHz machine was still a little sluggish for *Vibra 9000*, so the faster the Mac, the better.

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AKG C1000S

S is more

AKG's original C1000 was the first back-electret capacitor mic I ever owned, and the difference it made to my recordings was both obvious and immediate. Whereas dynamic mics always left my acoustic instruments sounding choked at the high-frequency end, the C1000 produced a far more open, articulate result — but at the same time, the sound remained warm and musical. That was a very long time ago and since then, the C1000 has undergone a number of small design changes.

Later versions of the C1000 were designated the C1000S, largely because a little plastic widget could be slipped over the capsule to change the polar response from cardioid to super-cardioid. My own view is that while the hypercardioid response may be better for live work, where spill can be a major problem, the regular cardioid pattern may be more forgiving in the studio, especially for vocal recording where the sound source has a tendency to move.

Construction

Cosmetically, the main difference between the latest C1000S and its predecessor is the colour. Gone is the dark grey metallic finish to be replaced by metallic champagne, which makes the body appear marginally slimmer. In most respects, however, the materials and construction seem very similar to those of the earlier model.

The main body of the microphone is machined from a very solid chunk of aluminium, while the front tube is turned from brass — this may be a budget microphone but the construction is thoroughly professional. The output signal appears on an integral 3-pin balanced XLR socket, and a dedicated stand adaptor is included as part of the package, along with a plastic carry case and the two response-modifying widgets.

One of the most useful aspects of this microphone is that it can be run either from an internal 9V battery or from regular phantom power (from 9 to 52V), making it useful for location recordings where phantom power may be unavailable. The capsule itself is fitted with a removable foam windshield that sits inside the stainless steel basket, and access to the battery is achieved by unscrewing the two halves of the microphone body. Disassembling the mic in this way also provides access to the capsule, allowing the included PPC1000 pattern adaptor to be fitted or removed. A second (and as yet undocumented) plastic widget is now provided that, I'm told,

AKG C1000S BACK-ELECTRET MICROPHONE



Paul White tries the latest incarnation of an old friend and discovers that beneath the new paint job, the traditional valves have been maintained.

tailors the high-end response of the microphone, though I was hard pushed to hear any real difference on vocals. As standard, the mic has a nominally flat response with a very gentle presence peak at around 3kHz.

When run from batteries, a regular PP3 9V alkaline battery is used; the on/off switch on the body conserves battery power when the mic is not in use. As the current consumption is less than 2mA, the battery life is usually a couple of

AKG C1000S £200

pros

- Warm, detailed sound.
- Solid construction.
- Battery or phantom power.

cons

- Plastic response-tailoring devices can be difficult to fit and remove.

summary

A good-sounding budget all-rounder, but faces stiff competition from the likes of Audio Technica and Rode.

SOUND ON SOUND

hundred hours or so. Fitting a new battery is easy, but I can't say the same for the HF-tailoring widget — it's a very tight fit over the capsule and unless care is taken, it would be easy to damage the shockmount while trying to remove it.

Unlike a dynamic mic that tends to tail off above 16kHz or so, the C1000S has a useful response extending from 50Hz to 20kHz. The sensitivity of 6mV/Pa is less than that of many true capacitor mics, but is still adequately sensitive for most recording tasks, including acoustic guitar. Though no pad switch is fitted, the microphone can tolerate SPLs of up to 137dB, which means it can be used close to guitar amps or drum kits with no problem, and the equivalent noise level of 22dB A wtd is very respectable for a mic of this type and price.

In Use

Though there are more open-sounding back-electret mics available, I've always felt that the C1000 successfully combined the warmth and weight of a good dynamic mic with enough high-end detail to allow a sound to breathe properly. In fact I have used the C1000 to record the main vocals on more than one serious album project in the past, though to be fair, I'd almost certainly use something a little more sophisticated now. The new C1000S has much the same

comfortable quality as its predecessor, and proves to be a good all-rounder that can handle vocals and acoustic instruments with equal competency. The solid construction means the mic can be used either live or in the studio, but for recording work an external pop shield is pretty much essential, as the internal foam shield is too close to the capsule to be very effective. The C1000S may not have the same transparency as a high-end capacitor mic, but for me its real strength is that it seems to combine the best aspects of both dynamic and capacitor mics in a very natural-sounding way.

Summary

The AKG C1000S represents exceptionally good value, not least because sharp competition in the home recording microphone market has forced prices down to the point where the mic is cheaper to buy now than its predecessor was ten years ago. Not only is this a good-sounding and versatile back-electret mic, it's also very solidly built and performs well on battery power if required to do so. It's perhaps true to say that because the number of low-cost quality microphones has increased so much in recent years, the C1000S is no longer the clear leader that it once was, but it still has enough going for it to merit a place on anyone's sub-£200 microphone short list. **SOS**

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moving

MAKING THE TRANSITION TO COMPUTER-BASED DIGITAL RECORDING

on up

It's not hard to see why computer-based digital audio recording can seem so attractive. If you're still relying on analogue recording media with an absolute maximum of 24 tracks (but more likely eight or 16), the merest glance at a typical digital audio sequencer, with tens of super-flexible audio tracks, virtual tracks, and a multitude of processing plug-ins, is enough to send you racing for your sledgehammer and bawling for your piggy-bank's blood. The attraction is even more understandable to high-tech musicians who already have MIDI sequencing experience, as the same basic user interface is employed to carry out digital audio recording operations. For many, the whole concept appears irresistible.

As indeed it should! Digital audio recording on computers has clearly now passed its infancy, when only the moneyed few could play the game, and reached the stage where a modest outlay can bring you track counts and processing capabilities which would have the superstars of yesteryear taking an axe to their Synclaviers and Fairlight Series IIIs in outrage. However, as we all learnt at puberty, adolescence brings its own problems and a different situation to get used to.

When I first proposed the idea for this article to the editorial team at *Sound On Sound*, I was mainly concerned with getting across some fairly specific advice on setting up a computer-based digital system, such as avoiding clicking by routing word clock correctly, striking a balance on CPU usage between track counts and signal processing, and so on (and for those who have already taken the plunge into digital audio, the second part of this feature next month will actually address some of these very important aspects of setting up a digital audio sequencing system around a computer). But thinking back to all the tortured souls I have spoken to on tech support phone lines or at trade shows who were reaching the end of their tether with computer-based digital audio systems, the ones who were in the most impossible situations did not just have a misrouted word clock, or one too many plug-ins running. Their problems ran much deeper in the choice of hardware and software and in their expectations of what such a system should do, and how quickly they should be able to achieve it. In fact, the more I thought about trying to help people deal with the transition to digital audio, the more I realised that the seeds of their happiness or sorrow are sown long before they have a hooked-up system malfunctioning in some specific way. Time and time again I found myself thinking 'if only I'd been able to speak to

Part 1: **Paul Wiffen** has been introducing people to digital audio on computers in one form or another for 10 years now, but sees people falling into the same old traps time and time again. In the first part of a short series he explains the importance of making the right decisions *before* you buy a new system.



Fifteen years ago, computer music systems like the Fairlight CMI (above) cost as much as a decent-sized house. Today, their capabilities are dwarfed even by standard desktop computers — but that extra power and complexity can make getting to grips with modern computer-based music seem rather daunting.

that person before he bought anything, to find out what he was expecting to be able to do.'

Many of the actual problems these people were having have long since been solved, but the underlying misunderstandings and incompatibilities reoccur in new and more twisted forms. By stepping back from the immediate problems and looking at the general situation, however, I have been able to formulate some guidelines which should prevent new users from wading straight into quagmires where others have



already floundered. Some of them may seem a little obtuse to start with, but bear with me and I think you'll save yourself a lot of time (and heartache!). So here goes...

You're Not In Kansas Anymore

The most important thing to remember at every point in the process of setting up and using a digital audio recording system based on a computer is that your central purchase is exactly that — a computer, not a musical instrument or recorder. It is a collection of components designed and optimised within an industry which has a completely different set of priorities to you. So if you ring up the mail-order computer supplier (whose deal on a Pentium II 333kHz with a 9Gb hard drive and 24x CD-ROM led you to buy from them) to tell them that your recordings are stuttering, don't be surprised if they have no interest in, or advice on, your problems.

When you buy a computer, you are not in the music industry any more (the Kansas in my heading). Just when you'd got used to all the pitfalls of buying a musical instrument to do what you need, suddenly you have deal with a completely different set of operational parameters. The fact of the matter is that you are probably going to have to learn a fair bit about computer

technology, (probably no bad thing at the end of the twentieth century) and the way digital audio programs use it, before you can get the best out of your system. So how can you find the Yellow Brick Road that gets you back to Kansas, that lets you take this product of another industry and make it into something which facilitates your music instead of getting in the way?

You can reduce the amount you need to learn about general computing at the outset, by buying from someone who has not only heard of hard disk recording but can supply the entire system pre-configured, including whatever software and hardware add-ons like audio cards you decide you need (see September's PC Musician for more on specialist suppliers for music). You may end up paying more for your computer than if you buy it from that mail order company whose margins are so low they go out of business, but at least they might still be there when you need help (take it from a man who bought a PC from Escom two months before they went out of business!).

Another great tip is to talk to someone who is already doing what you want to do with a computer. They may not have ended up with the right system for you (and the last thing you should do is simply buy exactly what they have, especially if they have had it for more than three months),



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▶ but there will be useful clues to help you get your ideal system together. Many computer-using musicians have now formed their own networks of info and advice, using everything from the good old-fashioned telephone to email and on-line groups to help each other through the jungle of computer-aided digital audio.

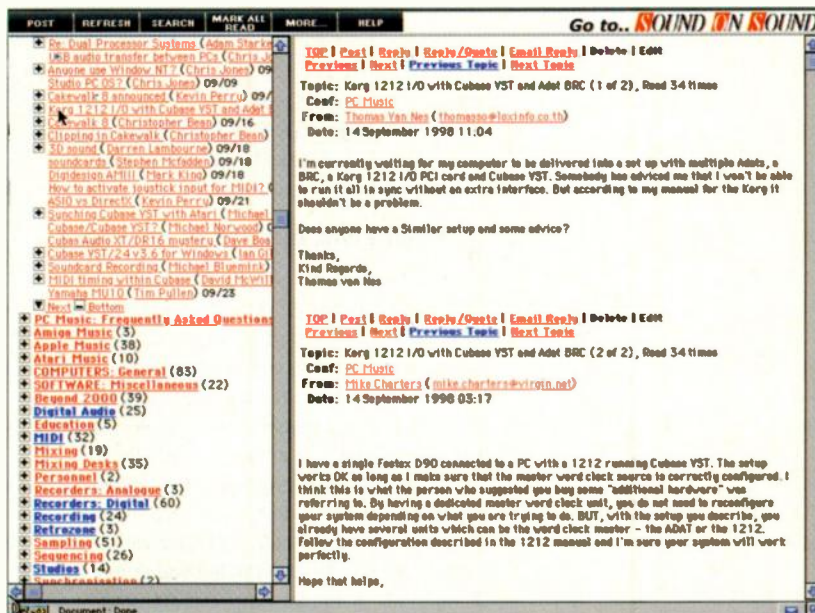
Get Your Priorities Right

Of course, there are some things you can do to reduce the risk of becoming a complete computer nerd who never actually gets around to recording anything. The first and most contentious of these is to make the decision which platform to go with for the right reasons. Here are just some of the more ridiculous reasons I have been given in the last year for their choice of platform by people with systems not delivering the performance they had hoped: "so I can get software free from the office/college/my mates," "I wanted to access the Internet and send email," "so that the kids can play games on it," and (my personal favourite) "because I wanted to publish the church newsletter on it as well." These people are storing up extra grief for themselves by increasing the risk that, having got the best level of operation they can from their music system, the next time they come back to it the installation of a game will have re-plumbed their audio routings, or a DTP package will have tied up the printer port so that the MIDI interface doesn't work.

If you relegate music-making to second or third priority when choosing your computer, don't be surprised if you don't get the best out of it for that application. The safest way to optimise your system for music is to use it for nothing else whatsoever. But back in the real world, you keep being tempted by a great-looking alternative application, for which all you need is... a personal computer. The next thing you know, the central component of your recording studio is refusing to play ball, because of an extension or system conflict.

Now I am not comparing the musical use of a computer to a marriage, where any straying with other partners such as games, Internet access or desktop publishing is punished by divorce from the primary object of desire (although many a trial separation may well result). However, I can see a case for a computer equivalent of safe sex, where you take steps to protect your installation from the consequences of casual encounters with other applications. One of the ways of doing this was discussed in a recent *SOS* article on creating separate boot drives for different applications (see the PC Musician feature in *SOS* May '98). There are many other techniques for "Safe Music Computing" which are not really within the scope of this article, but I would like to share with you the way I avoid the problem; multiple computers.

At any given point in time (in the last decade at least), I have had several computers in use, each of which has a different role. One of these will always be the main music computer, a second may be a



sort of ancillary music machine, and another will be for my journalistic activities. Now 10 years ago, I would have been the first to be horrified at the idea that I would own several computers. But back then, I thought nothing of owning several synthesizers — and now the computer is a more fundamental component of my music-making process than the synthesizer, so what's the difference? In fact, there are better reasons for buying a new computer regularly than a new synth. Once purchased, a great synth will always make the same great sounds (at least until it breaks down irreparably). The computer, on the other hand, plays a more fluid role in the music-making process. One minute it might be chopping up a sample into little bits, the next recording a solo, the next running a DSP routine, whether an effect or a mixdown of several tracks. In fact, the number of things it may be doing is increasing all the time (the next task I plan to set it is physical modelling!). The more I ask computers to do, the more powerful they need to be.

Planned Obsolescence

The technological progress of modern computing is proceeding at such a pace that last year's computer looks like an antique, and the one from five years ago a dinosaur. An article by Peter Warlock in October's *MacWorld* (published in the same position and fulfilling the same thought-provoking function as *Sounding Off in SOS*) suggested that we no longer know what to do with all the power that is soon to be delivered in the form of 500MHz or even 1GHz clock speeds. Well, he's obviously never tried to do 32 tracks of hard disk recording with four bands of EQ per track and half a dozen plug-in effects, let alone move up to 24-bit recording! I'm here to tell you that whether or not mainstream computing will require next year's computers, I'm ready for them now (in fact, right now I could do with whatever the standard spec will be in 2001). Rest assured that once you embark on the headlong rush that recording digital audio on computers is becoming, you will feel the same. ▶

The World Wide Web can prove an invaluable source of advice and contacts — just take a look at the *SOS* discussion forums...

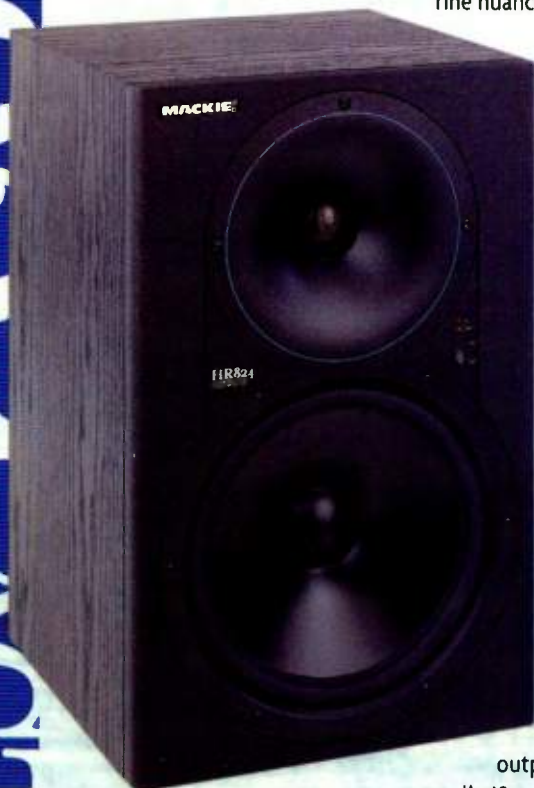
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* Electronic Musician, October 1997. All quotes are unedited.

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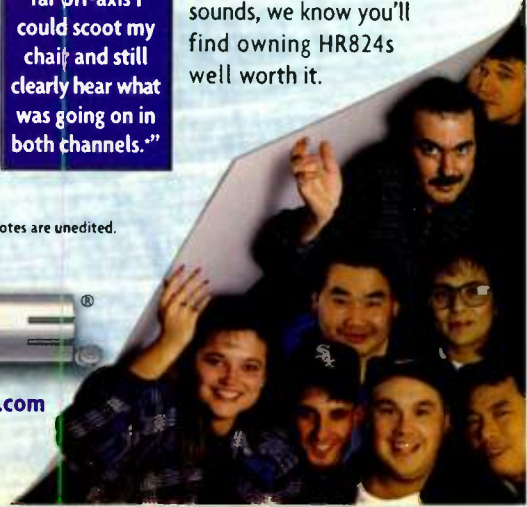
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► Each great new plug-in that you get only increases your need for power, and so does increasing the sample resolution and rate of your recordings. Be prepared for pangs of covetousness at news items in computing magazines on machines with an extra 50MHz of clock speed.

"But hang on a minute", I hear you cry, "that means you have to get a new computer every year!" Indeed it does, or in my case, every 18 months at least (looking at the average time interval between new computers I have acquired over the last decade). Think about it — how much do you spend a year on musical equipment? In my case, it tends to be three or four grand (even after I've pulled every stunt possible to beg, steal or borrow what I need). So what I do is allocate half of that outlay to my 'Not enough CPU power' Fighting Fund. Instead of 10 years ago, when all the money was spent on discrete keyboards, effects units and recording devices, I now use half the annual budget (it sounds so planned, doesn't it? It isn't, believe me!) to upgrade the computer power.

This is how I rationalise it. In the '80s, I watched the likes of Geoff Downes and Stevie Wonder spend the equivalent of the gross national product of a small African nation on a Synclavier or Waveframe, only to be told a year later that, for the paltry sum of \$50,000, it could be upgraded to the latest spec (stereo recording or eight tracks of hard disk playback or whatever it was at the time). In the '90s, I have watched producer friends upgrade their Digidesign system every 18 months to get more than four tracks per Pro Tools card, 24-bit resolution or more powerful DSP Farm boards, and each time it has cost them more than my annual budget for music gear. So I still feel like I'm getting away with something to be putting only £1,500 into the latest, most powerful CPU every 18 months. Below is a potted list of the major arrivals (all of which cost between £1200-1500 when I got them) in my computing career, complete with the must-have application and hardware add-on which forced my hand at the time (notice that every single one is a musical application!).

Needless to say, by the time I buy a new machine, the current one is worth a fraction of what I paid for it. Believe it or not, I consider this a good thing. If it were worth a significant percentage of the cost of the new machine, I might be tempted to part-exchange it or sell it privately, putting the proceeds towards the cost of the new machine. This is the biggest mistake you can make. There are much better uses for this machine than recouping a small proportion of your financial investment.

Firstly, it can continue to do the job it has been doing while I am getting the new machine broken in to the task. You wouldn't believe how often a new operating system throws up problems with a piece of hardware or software that works fine on the old machine — or how long it can take to get one platform to work as reliably as the other. For example, when I got the 8500/180 to run VST, it



The Atari ST is certainly long in the tooth, but if you're familiar with yours, you'll be able to work much more efficiently with it than you will at first with your new, super-powerful Mac or PC.

was three months before I got it working as well as *Cubase Audio 16* on the Falcon MkII, and it took the addition of a digital audio card which was only released six months after that before I could send and receive eight separate channels via ADAT Optical to a digital mixer, something which had been a staple part of my working practices with the Falcon for over a year. Sometimes the new computer never manages to do everything I did with the old. Despite the fact that Steinberg very kindly gave me a free crossgrade to *Cubase* on the Mac when I got my Powerbook back in 1993, the MIDI timing never sounded as good as on the Falcon. So when some unprintable person at WOMAD stole my Opcode multiple output MIDI interface, I took this as a sign and got an SMP11 for the Falcon. Even now, when the MIDI timing of a project is critical (or there are lots of MIDI tracks to run, which amounts to the same thing), I do all the sequencing on the Atari version of the software (and to judge by the interviews in *SOS*, so do quite a few other people), recording the result into VST on the G3 as digital audio.

It is only when the new computer is doing everything I want it to do that I look at moving the previous one (or the one before that) into an alternative computing role which has nothing to do with music. As soon as I got the Mega 2, the Mac Plus went into the study to become the computer I wrote all my articles on. That lasted until the Powerbook was relieved from running *Recycle* by the 8500/180 and now I only run *Microsoft Word* and *Quark Xpress* on that. In contrast, the two PCs were only ever used for the GM-compatible sounds of the Mediavision daughterboard and the Maestro 32 (I could never get used to the way Steinberg software runs on

"The more I think about helping people with the transition to digital audio, the more I realise that the seeds of their happiness or sorrow are sown long before their hooked-up system malfunctions in some specific way."

State Of The Art: Wiff's Computers Through The Years

COMPUTER	YEAR	MUST-HAVE APPLICATION
Mac Plus w/40Mb HD	1988	<i>Sound Designer (I not II)</i>
Atari Mega ST 2	1990	<i>Cubase</i>
Atari Falcon	1991	4T/FX
486/66/DX2 PC	1992	Korg Mediavision daughterboard
Mac Powerbook 540C	1993	<i>Recycle</i>
C-Lab Falcon MkII	1994	<i>Cubase Audio 16</i>
Pentium 100	1995	Terratec Maestro 32
Power Mac 8500/180	1996	<i>Cubase VST</i>
Power Mac G3/266	1998	<i>Red Velvet/VST 24</i>

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 - Yamaha P2150 Power Amp (S/N).....£200
 - Mackie 1202 Mixer (demo).....£200
 - Kurtzweil K2500 + Sample Option (New).....£2200
 - Soundtracs MRX32 8/8/16 s/h vgc.....£1500
 - Alesis XT 20 ex-demo.....£1600
 - Roland D110.....£150
 - Roland D220.....£200
 - Lexicon Alex.....£195
 - Alesis MIDiverb IV.....£225
 - Fender Hotrod deluxe
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► the PC), so as soon as I found ways to get the same sounds in the studio, they were moved out to the living room for more sensible PC usage such as games and CD-ROM reading.

I only ever get rid of a computer once everything it does has been replaced by a more recent machine. By that time, giving it away is about the only thing you can do with it, but it does put you on the good side of your relatives or employers, when you give them your computer hand-me-downs. I find it makes more sense to regard computers as a consumable or write their value off over three years, and use them in a secondary or recreational role, than try to get some money back from them when you move up to the next model.

This also solves the problem of the ever-present temptation to use your main studio machine to play games on or scan pictures into (which is how I got onto this multiple computer topic in the first place): use the older machine instead and keep your main recording system untainted.

Buy Before You Need, Not When

This way of working applies even more to those of you thinking of moving to a computer system for digital audio for the first time. Whether you have a trusty cassette recorder, a multitrack analogue machine or something more recent like an ADAT, don't sell whatever system you have been using to record audio until you have the new computer system up and running (you may well be able to use the ADAT in a computer system as eight A/D and D/A converters, as I'll explain next month). The same advice holds good if you have been using an Atari for sequencing MIDI: don't get rid of it until you are happy with the MIDI results your new digital audio computer setup is producing.

I have seen so many people end up tearing their hair out because they have part-exchanged or sold their old system before their new machine was fully up and running, especially if they have done this on the eve of a brand-new project which is supposed to be justifying the new purchase. All too often they end up with unhappy clients or fellow band members, or they miss a great career advancement opportunity because they couldn't achieve the simplest of tasks which took them no time at all on their old systems. Only phase out the old technology when the new stuff is doing the job properly, reliably and for a sustained period. In fact, I would say this maxim should be applied to everything in your studio (or even in your life), computer-based or otherwise.

The Most Important Component — You

The other factor, of course, is that even if the system is working 100 percent (as it should from day one if you bought it from a digital audio dealer who is able to set it up properly!), there is still the fact that you aren't immediately going to be able to work at 100-percent efficiency on a new

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ATARI 10

Given the paltry price your old computer system is likely to fetch second-hand, wouldn't you be better off hanging on to it?

system. By contrast, you have probably been using your old tape system or Atari for years, so that operating it has become second nature, not just in the physical manipulation of the controls but also in your comprehension of the way the system works. Don't expect any new system to feel like second nature for some considerable time. This is another reason why you should keep your previous system — so that if you need to do something quickly, you are not fighting your way through the project. I talk to people all the time who say "I used to be able to do this so quickly and easily on my old system; how come the new system takes so long/doesn't do it so easily?" Of course, sometimes there are some things which a new system cannot do as well as a previous system (which is why I never get rid of an old system until I am sure the new one replaces all the tasks I need to do), but more often than not, it is that the careless upgrader has not yet become accustomed to the new system and nothing is where they expect it to be. At the same time they are experiencing this frustration, they are comparing it with the level of unconscious operation they had got to with their previous system, where they didn't need to think of what to do, it just seemed to happen naturally.

You won't start to get the best of out your new system until you have trained yourself up to use it. So make sure that you have the time to learn the system before you have to use in earnest. The best time to upgrade is when you have some free time to learn to use your new setup, or some non-urgent projects which you can use to ease yourself into familiarity with the new system. That is the best way to make sure that the promised improvement in working conditions and results is actually delivered within a reasonable timescale.

I hope that these thoughts give you some initial guidelines to follow when contemplating the thoroughly worthwhile move to digital audio sequencing, without incurring some of the grief I have seen others go through. Next month, we will get down to the nitty-gritty of defining what you expect the system to do for you (having read all the great sales pitches out there) and spec'ing out the computer, the software and the hardware additions that will fulfil your expectations. We will also look at some of the vital concepts you may be meeting for the first time like sample rate and word clock; a simple understanding of these can make all the difference between a great system and a living nightmare. ☺

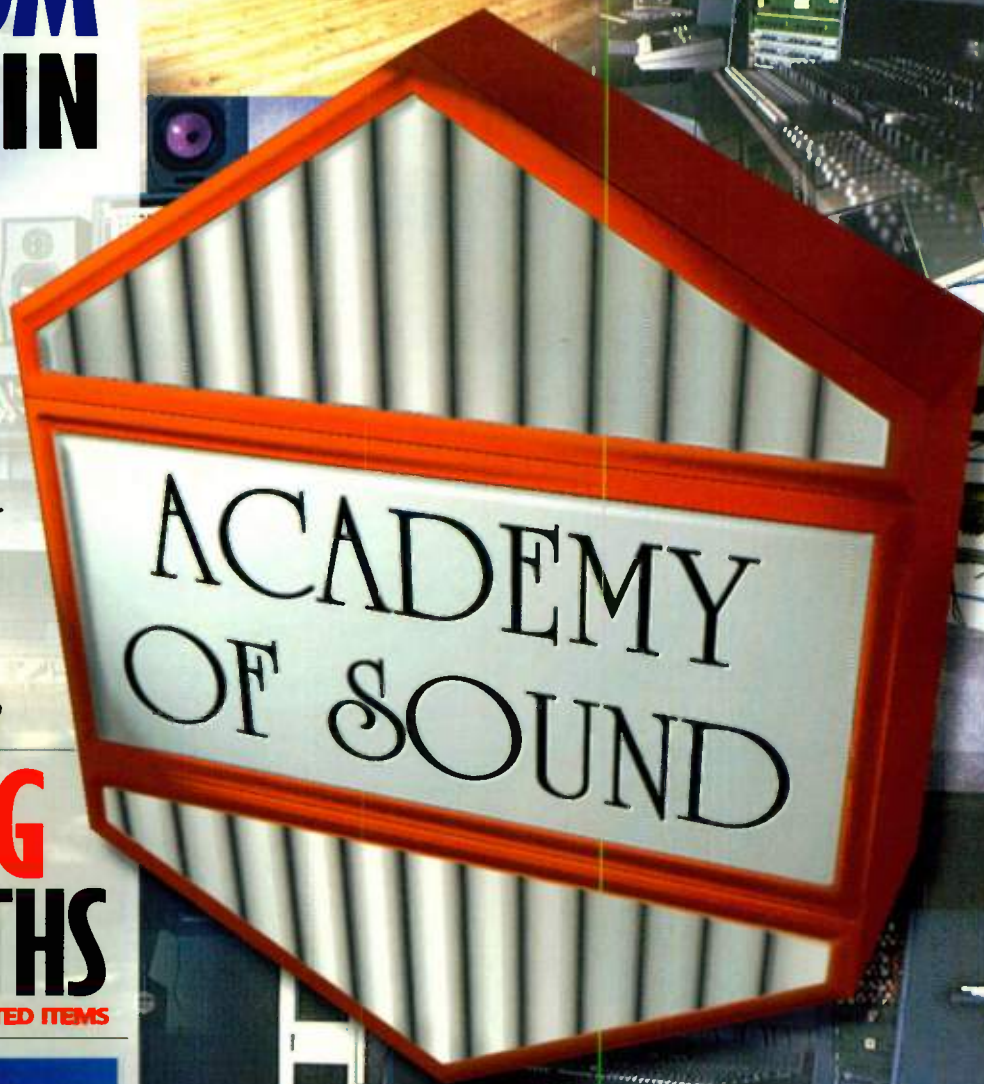
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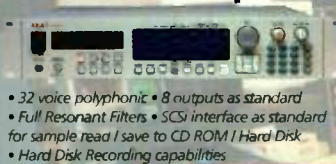
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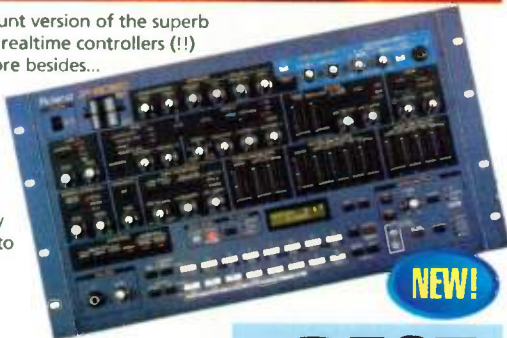
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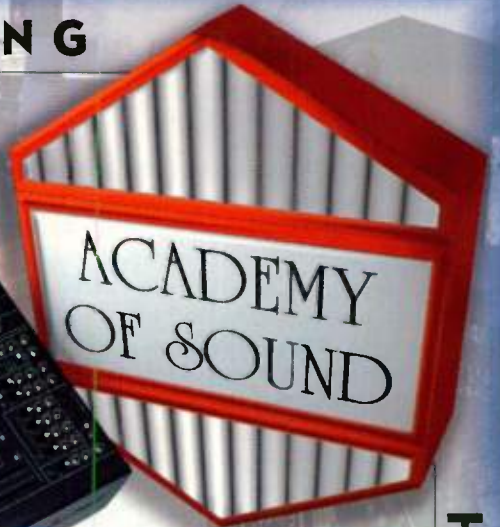
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ROLAND G1000

Roland's introduction of the G800 Arranger Workstation in 1995 marked the company's response to a home keyboard market in which the auto-accompaniment keyboard was drawing steadily closer to the workstation synth in concept, appearance and technology. As such, the G800 was a departure from the approach of Roland's E-series home keyboard range, which was avowedly more traditional in presentation and less advanced in spec than the keyboards many of the company's competitors were putting out. And at £1999, it was designed to compete in the prestigious 'flagship' price range occupied by home keyboards from many of those competitors, such as the Farfisa F1, Solton MS60, Technics KN2000 and Yamaha PSR6000, whereas the price point of the top E-series model put it in competition with budget versions of other companies' flagships.

While the G800 seemingly marked the beginning of a distinctive new range for Roland, it was followed by only one other model, the scaled-down, mid-priced G600. Now, three years on, the company are releasing the G1000 Arranger Workstation as a successor to the 800. The new keyboard looks strikingly similar to its predecessor — so what, if anything, have Roland come up with to update the G-series for the late '90s?

First Contact

Like its predecessor, the G1000 is a sturdy-looking, imposing instrument with the sort of serious, professional demeanour traditionally the preserve of the workstation synth. Rounded out by a 76-note keyboard, it's a look which marks this keyboard out as a player's instrument. The keyboard itself has synth-style plastic keys and a medium travel, and although described by Roland as weighted, the action has more of a semi-weighted feel to it, comfortable and fluid but not insubstantial. A controller-rich front panel is nothing new on home keyboards, but again like the G800, the G1000 has such a proliferation of buttons on its front panel that it can feel rather overwhelming at first. However, you rapidly become familiar with the layout. I feel less generous about the small LCD screen, which on first encounter seems rather unsatisfying after the large displays of Korg's i30 and Technics' KN5000.

The sound of Roland's latest G-series keyboard is characteristically crisp, clean and bright, but it also has a 'new improved' smooth, well-rounded, silky quality to it, with a lively and appealing presence. I was also struck by the G1000's ability to combine richness with sparkle, and delicacy with fullness of sound. 'Polite' and 'tasteful' are adjectives which spring to mind when describing the keyboard's overall sound (ensemble and solo) — 'gritty', 'gutsy' and 'earthy' aren't.

The G1000's sonic architecture can be summarised as follows. The fundamental unit of sonic currency is the Tone, or basic sample. These may be arranged in Styles — essentially eight-part multitimbral arrangements of Tones (six parts plus drum and bass) playing in patterns (or Divisions, as they are known). Finally, there are the

Performances, in which complete Tone, Style, keyboard split, tempo, and effects settings may be stored. Let's look at each of these in more detail.

Tones

The G1000's Tones are derived from the company's SC880 module — the next generation of GM/GS technology on from the SC88, which

Roland's latest high-end arranger workstation is the company's first for three years, yet it looks strikingly similar to its predecessor.

Does it have anything new to offer in an increasingly sophisticated market? **Simon Trask** arranges some time with the G1000...

Gf

ROLAND G1000 ARRANGER WORKSTATION

force



ROLAND G1000 £1999

pros

- Attractive, dynamic quality of the preset sounds.
- Large selection of built-in music Styles (and you can add your own!).
- User Style programming.
- 16-track sequencer.
- Large and versatile collection of professional effects.
- Built-in Zip disk, providing large storage capacity and fast data access.

cons

- Small LCD.
- Limited sound editing, and for Parts, not individual Tones.

summary

A mature home keyboard in conception and technology, more traditionally inclined in approach and emphasis than offerings from some other manufacturers, but offering plenty of scope for Style if not sound customisation.

SOUND ON SOUND

formed the sonic basis of the G800. Over the years Roland have steadily improved their GM/GS technology with respect to sample quality, sound quality and sheer number of Tones, and playing through the G1000's sonic offerings I was struck by the professional quality of the range, and the impressive variety of sounds on offer courtesy of GS Format's Variation architecture (almost 1200 Tones, in fact, compared to just under 700 on the G800). The number and variety of drum kits has also increased over the years, to accommodate an ever greater range of sounds and Styles — the G1000 has 43 kits compared to the G800's 25.

On the other hand, creative synthesis is not a consideration with GM/GS; you can't edit individual Tones on the G1000, and the emphasis is on clear categorisation of instrumental sounds rather than category-busting sonic experimentation. As on the G800, you can make limited sound edits (vibrato rate, depth and delay, filter cutoff and resonance, envelope attack, decay and release) at the level of individual keyboard parts rather than individual Tones, but that's all. GM/GS is in essence a playback technology rooted in the desire for standardisation expressed by the General MIDI spec. Still, where GM's single bank of 128 sounds was a grave limitation, the progressively greater number of GS Format Variation sounds introduced by Roland over the years has gone a long way to surmounting this limitation while retaining the convenience of GM. On the G1000 you're spoilt for choice, yet the GM/GS organisation allows you to easily locate the sort of sound you want.

Styles

Moving up from the basic Tones, Roland's Style programming impresses, as always. Thanks in part to the quality of the sounds being used, the G1000's Styles have a dynamic, energetic musical quality which makes them enjoyable to play along with. Long gone are the days of stilted backing arrangements with unrealistic sounds. As already mentioned, the G1000's backing patterns can have up to six arrangement parts in addition to the bass and drum parts, giving plenty of scope for variation in the arrangements, and making it easy for users to drop in, say, a brass stab or two, or a guitar twiddle.

The G1000's 128 ROM Styles run the usual gamut of keyboard styles from the traditional 'strictly ballroom' keyboard fare of waltzes, marches and cha-cha-chas through popular styles ranging across the decades — from swing to the house and jungle of the modern dancefloor. The Latin Styles are more authentic than the 'cod Latin' of the ballroom, and have an appealing vibrancy to them which is more in tune with contemporary Latin musical culture. Surprisingly, the jungle Style (ambient drum & bass would be more accurate) is quite decent, though overall the modern dance Styles have more of a pop feel to them, and probably won't appeal to the dance *aficionado*.

However, for the jobbing keyboard player who needs to draw on a wide range of musical genres, the G1000's Style presets offer something for most



ROLAND G1000

► requirements — and even if they don't, you can bring in external Styles if you wish (see box, below).

Each Style has two 'levels' of operation, Basic and Advanced, and within each of these has Intro, Original, Variation, Ending and Fill-in patterns, or Divisions. In essence, Advanced offers another version of the selected Style, often more elaborate or fuller-sounding. There are three Fill-in options: Fill-in to Variation, Fill-in to Original, and Fill-in to Previous. Each of these has its own button, as do the Intro and Ending sections, while other buttons let you switch between Basic/Advanced and Original/Variation respectively, with adjacent pinpoint LEDs to tell you at a glance which is selected. You can also program keyboard aftertouch to switch between different Divisions 'on the fly', for instance to and fro between Original and Variation; this then works from any note(s) played on the keyboard, not just those in the trigger area. In addition, you can globally set the G1000's footswitch input to control Start/Stop or selection of/switching between Divisions.

For each of the Divisions, the G1000 actually has three pattern memories, which can be triggered by three different chord types: major, minor, and seventh. In performance, the pattern changes immediately you change chord. In practice, anything above a major or minor triad (with or without augmented or diminished fifth) triggers the seventh-type pattern. This ability to change patterns simply by playing a different chord type can be very useful for pattern-based live sequencing, where any chord changes in the music are pre-programmed into the patterns themselves.

Roland's keyboard also lets you step through four Drum Variation levels using dedicated up/down buttons. This very effective feature switches between rhythm pattern variations for the current Division, further helping to give the backing arrangements a sense of musical variety and spontaneity. However, it's a pity you can't switch Variation levels using keyboard velocity or aftertouch. The variations aren't pre-programmed



The G1000's front panel is crammed with features. Here's where you set up and edit keyboard splits, select Tones from the 1161 available, and edit Performances.

rhythm patterns; rather, variation four is the full rhythm pattern for the current Division and chord, and the G1000 successively removes drum and percussion parts for variations three to one. Another useful feature is the Dynamic Arranger, which adjusts the volume of the auto-accompaniment according to how loudly or softly you play in the trigger area of the keyboard. But more than this, you can turn the feature on or off for each accompaniment part individually, and specify not only the degree of response to velocity but also the direction.

Specification

- Keyboard: 76 weighted keys, velocity and aftertouch-sensitive.
- Polyphony: 64 voices.
- Multitimbrality: 32 parts.
- Tones: 1161 + 43 Drum Sets; GM/GS-compatible.
- Styles: 128 presets in ROM, 16 in Flash ROM; 111 on Zip disk (accessible via Disk Link feature); more than 430 Styles on factory Zip disk.
- Performances: 192.
- MIDI Sets: 8.
- Sequencer: 16 tracks, editing functions.
- Effects: reverb (8 types), chorus (8), delay (10), Insert effects (89), two-band

parametric EQ.

- Built-in storage: 3.5-inch DSDD/HD floppy disk drive, Zip drive.
- Display: 240 x 64-pixel backlit graphical LCD.
- Connections: Output 1 (L/Mono & R), Output 2 (L/Mono & R), MIDI A (In, Out, Thru), MIDI B (IN, Out, Thru), Metronome Out, sustain footswitch Jack, expression pedal Jack, footswitch Jack, FC7 foot controller Jack, phones out, SCSI port, AC power in.
- Weight: 18.5kg.
- Dimensions: 1267mm (W) x 407mm (D) x 150mm (H).
- Supplied accessories: Zip disk containing 441 additional Styles and 306 Standard MIDI files; slot-in metal music stand; power cord.

Expand In Style

Roland's new keyboard isn't just limited to its onboard preset Styles. The company have stolen a march on other keyboard manufacturers by including a built-in 100Mb Zip drive; also included is a SCSI port so you can hook up other, external drives if you want. The G1000 comes with a factory Zip disk providing over 400 additional Styles and over 300 MIDI song files. In addition to the 128 onboard ROM Style memories, the keyboard has 121 Disk Links Style memories (in Banks C and D) which can be programmed with pointers to Style memories on disk. When you select one of these memories, the Style is loaded in about a second off Zip disk into a single RAM memory (D88). Loading can take place in the background while a Style is playing, and the G1000 moves smoothly to the new Style at the beginning of the next bar; in practice you might just as well be selecting a Style from internal memory. Of course you need to have the right Zip disk inserted for the pointers, but you can save the set of pointers as

part of a Performance Set file onto the same disk as the styles they point to, and load the pointers when you insert the disk.

Roland's new keyboard also introduces 16 Custom style memories, consisting of Style data which is stored in Flash ROM so it isn't lost when you power down. Roland pre-install different sets of Custom Styles for different countries or regions — an idea whose time has definitely come. UK models get modern dance Styles, but all the Custom sets are available on the factory disk for loading; you can also create your own Custom sets, say for convenient access to your most-used Styles.

Another way to expand the range of available Styles is to program your own. The G1000 follows its predecessor in offering user Style programming capabilities (a must on any self-respecting keyboard these days). The RAM location D88 is used for this purpose. There are three ways to create a new Style: copy any section(s) of any track(s) from a MIDI song file (among other things this allows you to make use

of MIDI song file toolkit disks such as those from Keyfax Software), copy an existing Style into the D88 RAM and selectively edit the parts to customise the Style, or program a Style from scratch.

Copying from existing Styles is extremely flexible, as in addition to copying a single Style wholesale, you can copy right down to a bar/beat/clock range of a single track of a single pattern within a single Division, and freely mix and match in this way from different internal and disk Styles.

Recording Style tracks yourself is a straightforward process, though it's a shame that you can't switch tracks while loop recording. The G1000 provides erase, delete, insert, transpose, quantise, velocity adjust, gate time adjust, and note-shift editing features, all with optional bar/beat/clock ranges and some with note ranges. Also provided is an event-level editor, the Microscope editor, which lets you step through, listen to and edit an alphanumeric listing of the note (and indeed all other) data. Insert, delete, move and copy functions are also included.

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ROLAND G1000

► There are three chord trigger modes available: Standard, Piano Style, and Intelligent. You can also specify whether the chord trigger range will be below or above a split point, or across the entire keyboard. Intelligent is actually the 'simply play' mode, while Standard requires you to play the proper chords. Piano Style does the same as Standard but only registers a chord change if you play more than two notes at once, so you can readily mix two-handed chordal and solo playing (whole keyboard mode is best for this, of course).

While it doesn't have a dedicated front-panel mixer section, the G1000 does provide mixing capabilities via a combination of LCD pages and the knobs and buttons below the screen. A simple Volume mixer, called up by pressing the Volume button in the central panel, lets you edit volume levels and mute status for multiple parts at once (but not the Style parts 1-6). Meanwhile, the Realtime page (which handles the parts you play from the keyboard) and Accompaniment (to handle the Style-driven backing) page in Mixer mode let you edit volume, mute, pan, EQ on/off and reverb, chorus and delay send level settings for a single part at a time (including the individual accompaniment parts). With the Mixer mode pages called up, you can readily switch between the two types of mixer with successive presses of the Volume button. However, I would like to see Roland add a Volume mixer page for the Style parts 1-6. The G1000's system software is held in EPROM and can be upgraded off floppy disk, so in theory, at least, there's scope for additions.

The Realtime page in Mixer mode also lets you turn the G1000's insert effects processor (called the EFX) on or off for each keyboard part; unfortunately you don't have the option to route individual accompaniment parts through the EFX, a feature which would have been useful for anyone concentrating on the accompaniment parts for live composition/mixing rather than traditional backing performance.

From the Mixer mode pages you can readily access effects editing by pressing F4 and using the page up/down buttons to select editing pages for the G1000's clean, smooth reverb, chorus, delay, EQ and EFX processors. You can only select, not edit, an EFX effect, but you can edit two pre-defined parameters for each effect using the

Realtime Parts

As mentioned elsewhere in this article, Realtime is Roland's name for the Parts whose sounds you play on the keyboard (as opposed to the auto-accompaniment parts played for you by the G1000's virtual 'backing band'). There are three Upper parts and two Lower parts, plus Manual Bass and Manual Drums and a Melody Intelligence part. Each part can be turned on or off individually, and you can select Whole Left, Split, or Whole Right keyboard assign mode to determine how the sounds (Tones) are spread across the keyboard, making a variety of split/layer keyboard textures possible.

Each part has its own volume and pan settings and effects send levels, and can have EQ and/or EFX routing turned on or off. The

Melody Intelligence part, by the way, is used by the Melody Intelligence harmonisation function for Upper 1; as well as choosing from 18 harmonisation types, you can assign the harmony notes their own Tone and their own volume, pan, effects send level, EFX on/off and EQ on/off settings.

The Upper 3 part is only available in a split arrangement with Upper 1 and/or 2, for up to a three-way split, with Upper 3 between the Lower and other Upper parts. You can define the main and the Upper 3 split points yourself, simply by holding down the Split or Upper 3 button and then playing the required note on the keyboard. The main split point also defines the upper or lower limit of the chord trigger area, depending on whether you selected Lower or Upper as the trigger range.

two front-panel DSP EFX sliders (the selected parameters are listed at the back of the manual).

Performances

With its One Touch function enabled, the G1000 calls up preset keyboard sound, style tempo and effects settings for each of the 128 ROM styles. However, to customise these and other settings you can turn to the keyboard's Performance memories.

In time-honoured keyboard tradition, the G1000's 192 Performance memories store 'snapshots' of current settings on the keyboard. In the past these sorts of memories were commonly called Panel memories by keyboard manufacturers, as they stored the keyboard's front panel settings; nowadays, of course, they typically store many LCD-based settings as well. When you have all your settings as you want them, you simply Write them into a Performance memory for instant recall. So, for instance, you can customise the tempo, the keyboard sounds and even the auto-accompaniment sounds for any given style, as well as mixer and effects settings. Sound edits for keyboard parts Upper 1, Upper 2, Lower 1 and Manual Bass (see the 'Realtime Parts' box for an explanation of these terms) are also stored as part of a Performance, providing a way of customising individual Tones without editing the Tone memories themselves. However, you can't customise Tones assigned to the accompaniment parts, which in turn means you can't perform real-time sound edits on these parts (being able to change cutoff and resonance on the bass accompaniment part would have been an obvious choice, for example).

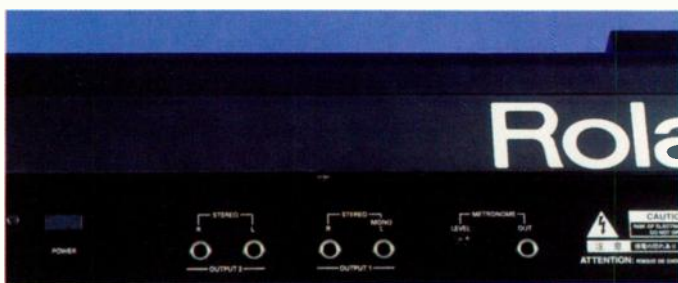


The other half of the front panel; this is where effects are chosen, playback and editing of MIDI files controlled, and Styles selected and edited.

You can call up Performances directly using the same numeric buttons used for Tone selection (a Select button toggles between the two options), or you can use the Up and Down buttons in the Performance Memory section of the front panel to step through them. Transitions from one Performance to another are smooth, so you can use multiple Performances in a single song, maybe just as a way to change the keyboard Tone assignments while everything else stays the same. You can also quickly turn off style, sound or keyboard mode changes from dedicated front-panel buttons — say, if you decide that you want to make live sound changes instead.

Playback & Sequencing

The Recorder section of the G1000 provides transport controls for playing back a MIDI song file that you've loaded off disk. You can solo and mute individual tracks from either the Song page in Mixer mode or the main screen of the 16-track sequencer in Song Tools mode. The highly useful Song Header Edit function allows you customise a MIDI file by changing global and track information



The rear panel, with its two stereo outputs.

at the head of the file. You can transpose the whole song to a more suitable key, change its tempo, even adjust the master tuning, and also select whether the song should use the reverb and chorus settings programmed into the song or those of the currently selected Performance.

For each track you can change patch, volume and pan settings along with reverb and chorus send levels, octave transposition, mute on/off status, track routing (internal, MIDI or both) and whether or not the track will execute SysEx and NRPN data. You can then write the song file back to disk complete with all your changes.

A handy A-B Loop feature in the Recorder section lets you set up loop points for any bar/beat range, allowing you to practice the melody line for a particular section, or solo over a repeating chord sequence. Another potentially useful feature is the Lyrics page, which displays any lyrics encoded into the MIDI file, highlighting the words as the song plays. The Recorder section, together with the Chord Sequencer, also allows you to record your own auto-accompaniment plus melody performances.

You can then call up the onboard 16-track sequencer (in Song Tools mode) and edit the generated parts or add further parts of your own in conventional linear recording fashion. Using the sequencer you can also bypass the auto-accompaniment section altogether and record your own sequences from scratch, or you

can edit a MIDI song file that you've loaded off disk. The sequencer section provides the bar-level editing functions mentioned earlier for style recording but doesn't have the Microscope event editor — a strange omission. You can record in real time from any point, in erase, merge or punch in/out mode, but there's no facility for loop recording.

Sequencer mode also provides a Style Converter function which lets you copy any bar range of any tracks of a song for your own custom styles. You need to set the Key parameter to the key of the section you're about to Convert, otherwise when you trigger it as an auto-accompaniment the pitches will be wrong. A handy feature here lets you quickly set up a loop over any bar range and listen to it play back, either all tracks or solo'd tracks. The 16-track sequencer rectifies a key omission from the G800. However, you should bear in mind that songs are saved with GS Format headers, and the whole orientation of the sequencer is towards creating GS Format songs using GS Format sounds — although the G1000 can transmit and receive via MIDI (Song tracks default to MIDI Out B 1-16, keyboard and auto-accompaniment parts to MIDI Out A 1-16).

Conclusion

For G800 owners who want a more sophisticated and versatile version of the instrument they're already familiar with, the G1000 fits the bill nicely — which was no doubt Roland's intention. Adding the Zip drive was a great move on Roland's part, and the Flash ROM Custom style memories are also a welcome feature, while the 16-track sequencer was a very necessary addition to bring the G1000 up to contemporary expectations. With its SC880-generation sound and effects capabilities and greatly increased number of Tones and Drum Kits, the new keyboard is a professional and powerfully versatile instrument sonically; however, with its GM/GS orientation and the absence of in-depth patch editing, this is not an instrument that will satisfy anyone into creative synthesis. As for the display, the LCD and its associated knobs and buttons provide a nicely streamlined interface, but I still feel a lingering disappointment that Roland didn't go for something more up-to-date and adventurous.

The Performance memories are great for storing split/layer keyboard textures with internal and/or MIDI'd sounds, and with the multitrack sequencer you can record your own songs from scratch in familiar workstation fashion. But the heart of the G1000 as an instrument is still its auto-accompaniment capabilities, and here it really excels, particularly with the power and flexibility it provides for user Style creation and customisation, and its suitability for live mixing and pattern-based music creation. For those keyboard players who want a versatile instrument for traditional auto-accompaniment plus melody performance, the quality, range and variety of the G1000's Styles, not to mention the sheer number of Styles courtesy of the factory Zip disk, make this a very attractive instrument. **SCS**

information

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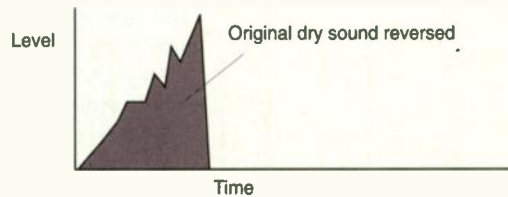
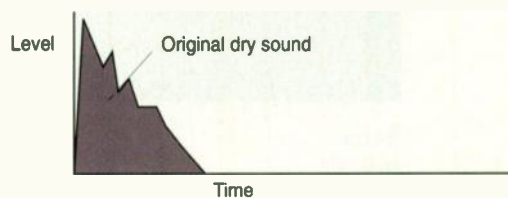
Paul White conjures up a nostalgic tape effect using an MIDI + Audio sequencer.

Back when we used open-reel analogue multitrack machines, creating reverse effects was easy. Admittedly it isn't the kind of thing you need to use that often, but it's a spectacularly eerie effect that far surpasses anything you can get ready-made from an effects box. The reason it's so eerie is that the reverb actually starts to build up before the sound that created it — something that quite obviously can't happen in nature without the aid of a tachyon pulse generator and a Star Trek script writer. The treatment is particularly good on vocals, but it's also been used to good effect on guitar solos, percussion and so on. Though often associated with the hippie era, reverse reverb lends itself nicely to dance music, especially trance, and it's also used extensively in sci-fi and horror drama productions.

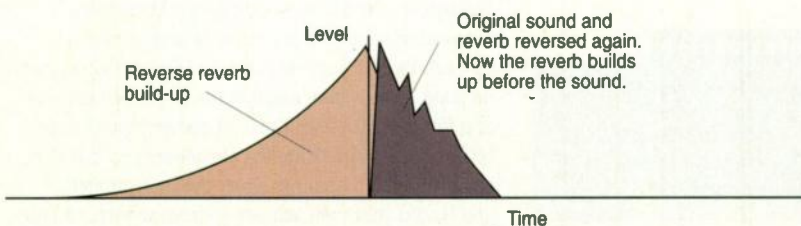
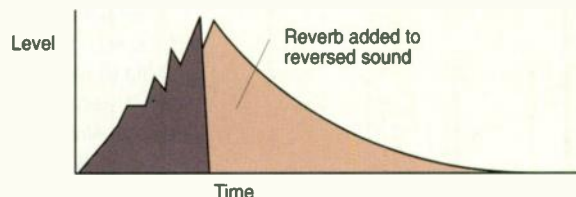
With tape, all you need do is flip the tape over so it plays backwards, feed the track into a reverb unit and record the result onto a spare track, (remembering that the track numbering is reversed when you do this). When you rethread the tape the right way around, the new reverb track will now have a reverse characteristic where it builds up slowly before the sound that created it, then it dies abruptly, as shown in Figure 1. It's all very psychedelic, but how do you do it in an MIDI + Audio sequencer, where there is no tape to turn over?

I tried this for myself using *Logic Audio* and it turned out to be pretty straightforward. I used the inbuilt 'native' reverb, but you could use an external reverb unit if you prefer. After recording the audio segment to be treated, I selected it and reversed it — virtually all sequencer-based hard disk recording systems include a reverse function. You could use any sampler with a reverse function if you don't have a hard disk recorder. Once the dry sound was reversed, I applied what felt like an appropriate amount of reverb and then used the

the hard (disk) way



The process of creating reverse reverb.



Reverse Reverb's Greatest Hits

You can hear this distinctive effect on the following classic — and not so classic — tracks:

- Sensational Alex Harvey Band, 'Boston Tea Party' and 'School's Out' (on the outro).
- The Beach Boys, 'Feel Flows' from *Surf's Up* (on the lead vocal).
- Pink Floyd, 'Wish You Were Here' (on drums).
- The Only Ones, 'Miles From Nowhere' from the LP *Even Serpents Shine* (on the drum fill in the instrumental section — a particularly over-the-top example!).
- Depeche Mode, 'Personal Jesus' (on the opening vocal).

'Bounce to Disk' function to create a new audio file with reverb (with a sampler, you'll need to resample the original reversed sound with the reverb). If you have tracks to spare, I'd suggest doing a completely wet reverb mix at this stage so you can combine it with the original dry track and adjust the balance at your leisure, but if not, just set up a reverb balance that's slightly on the wet side of normal and it should be OK — you can always try again if you don't like the result.

Before you can use the new file, it must again be reversed to get it playing the right way, and if you intend using the dry track as well, you'll also need to re-reverse this to restore normal playback. The result was an effect identical to that achieved by reversing analogue tape, and if you haven't heard this done before, I'd really recommend you try it. It's nothing like the reverse reverb effects in multi-effects units, where what you hear is really just a gated reverb with an

"In a world where pre-packaged effects tend to make more and more records sound similar, it's little tricks like these that help get you noticed."

envelope that fades up and then stops. Variations to experiment with include adding repeat delays to the reverb or using a very coarse reverb so that the individual reflections are well pronounced.

Because this is such a dramatic effect, it's best to use it sparingly. It works well on a vocal intro or bridge section, and I've also used it on a single, clean guitar chord where it produces an effect almost like the build up of a cymbal played with felt beaters, before ending in the chord itself. If you like playing with stereo effects, try panning the 'reverse reverb only' track hard to one side, then add a little normal reverb to the original track and pan that hard to the other side. This way the sound will built up at one side of the mix, the original sound will happen, then the reverb will tail away at the other side of the mix. Obviously this reverse trick only works when the effect you're using has an element of delay or reverb in its makeup, but there's no reason not to experiment with combination effects such as reverb and pitch-shifting. In a world where pre-packaged effects tend to make more and more records sound similar, it's little tricks like these that help get you noticed. **SCS**

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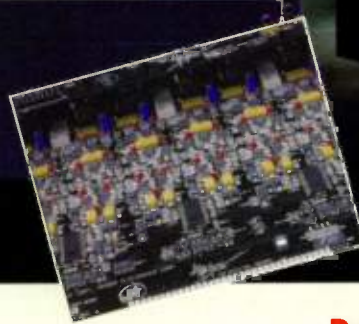
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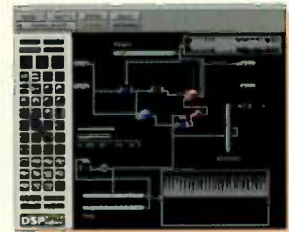
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RECORDING BLONDIE

▶ old days," he laughs. "They had quite a lot of stuff already written, but most of it mutated radically in the pre-production stages. We started out with a pile of stuff ranging from complete, finished songs through to little bits and pieces of ideas that they were keen to do something with. At that stage we had no vocals because that's how Blondie tends to work (see box below for more on this). Sometimes the melodies are written very early on, but most of the time they are not. Leon adds that the initial confusion was all part of the fun, because any song could be remixed at any stage and turned into something completely different. "What tended to happen was that each song would gradually shape up into a version that everyone liked. It wasn't so much a committee decision — just an instinctive feeling that we were on the right track."

The Basement And Beyond

With so many ideas to work with, Craig Leon decided that the best approach was set the band up in the basement, bring in a session bass player and gradually start going through the material until something began to take shape.

He explains, "We put everything we did on the RADAR, and at the end of each day I'd go through it and see what we wanted to keep. After about a month we had worked up about 25 ideas, some of which were very much like the original demos and some that had mutated into completely different songs.

"Once we had all that, we began to move quite quickly. I had rehearsal versions of the band playing to the MIDI which I then dropped out, leaving only a click. From there, we worked the ideas up into live arrangements with the whole band, then we moved into Electric Lady studios for eight days so that we could do the drums. There was no way I was going to record the drums in Chris's basement, because it just wouldn't have worked."

At Electric Lady, the band played live using a guide keyboard to represent the MIDI sounds. Leon says, "We used Electric Lady to record bass, drums and two guitars. We ended up mutating everything we recorded there, including the drums, which I put back into the RADAR so I could move them around. After that, it was back to the basement to put on the finalised bass parts, some of which were a composite of the rehearsal sessions and the recordings we made at Electric Lady. We did the same thing with guitars. With Chris' guitars we were recording virtually a riff at a time before deciding where they should be in the song."

While the band were at Electric Lady, Leon still had no vocals to work with, although he had an idea of the key of each song because he'd been working with Debbie Harry to get at least that much sorted out.

He says, "Chris and Jimmy have some lyrical input, but Debbie has the final say because it is her lyrical stance that defines the band. The process starts with Chris and Debbie listening to the backing tapes and coming up with melody



lines and the odd word — just snippets really. Then Debbie takes the tape away and writes the full lyrics, and soon after that we put the vocals on.

"Once we had the vocal melodies, she worked very fast — she certainly doesn't fool around. She knows what she wants and will do lead vocals for the whole album over the course of two or three sessions. We worked background vocals in later, using a sort of layering process. Then it was just a question of going through everything and ironing out what we had on each track."

The vocals were recorded in Chris Stein's basement, in a makeshift booth that was literally a cubbyhole lined with cheap acoustic panels and a few curtains to deaden the sound. "There was nothing technical or expensive about it — we just used the cheapest stuff we could find," Leon says. "Later we re-did some of them at Chung King — not so much for the sonics but because Debbie had written new lyrics. We also used Chung King to record a horn section and re-record some of Chris's guitars where we felt we needed a big room sound. The basement was fine for virtually everything but with the horns in particular the sound was too direct, and there wasn't enough air."

The main vocals were recorded with a ▶

Blondie founder member Chris Stein, left, with Craig Leon and Leon's wife and assistant Cassell Webb, (a recording artist in her own right). Also visible are Stein's MCI desk, Leon's RADAR and O2R, and other equipment including a Roland JD800 and JP8000.

Songwriting The Blondie Way

Although Blondie's early hits are rightly regarded as classic pop songs, the band's composition technique is highly experimental, as Leon explains. "Chris and Debbie's background is very much tied in with Warhol and William Burroughs. During the 1960s, Burroughs worked with two composers in Tangiers — Paul Bowles and Brion Gysin — and they came up with a technique called cut-ups. Basically, they would record on a Nagra tape recorder, chop everything up and then put it back together again as different arrangements with Burroughs talking over the top. Chris has collected quite a few of these works and has incorporated this sort of cut-up technique into the way Blondie records. The only other artists I know who work this way are David Bowie and, to an extent, David Byrne.

"If you have never come across this

technique before it can seem very confusing, as you certainly can't produce this type of music in a conventional way. You don't say right, let's put a hook line here, because to begin with you have more hook lines than you know what to do with and very little substance. The music develops gradually, with the band making decisions about what they want to keep as they go along. It sounds crazy but with Blondie it works really well, because what you get are these very groove-oriented Phil Spector kind of tracks with lots of instrumental hooks.

"Once we've recorded the entire backing track, Debbie takes it away and does what she wants to do vocally over the top of it. This does make the process quite complex from a production point of view, because in order for it to work you have to leave space for her vocals, even though you don't know what the vocal line is."



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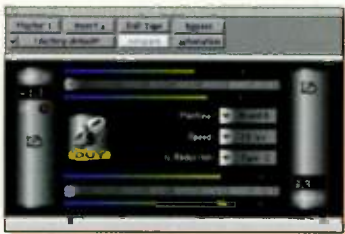
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the basement

CRAIG LEON: RECORDING THE NEW BLONDIE ALBUM

tapes

It has been a long time since the world bopped to classic Blondie tracks such as 'Sunday Girl', 'Picture This' and 'Heart Of Glass', but despite their long absence, the band (Debbie Harry, Chris Stein, Clem Burke, and Jimmy Destri) appears to have lost none of its appeal — which is why the big wheels of BMG's publicity machine are now beginning to roll in anticipation of *No Exit*, Blondie's latest album due for release on Beyond Records in January next year.

I don't suppose I'm the only ageing Blondie fan who is pleased to see the return of the band. But what is surprising after such a long absence — caused primarily by guitarist Chris Stein's health problems, which took him the best part of a decade to overcome — is that Blondie decided to record their new album in a basement instead of opting for some swanky, New York studio full of mod cons.

One would imagine that Blondie might have been keen to get back into a 'proper' studio, especially as technology has changed dramatically over the last 15 years. According to producer Craig Leon, however, it was the band's choice to record the bulk of the album in Chris Stein's New York basement, and although new technology was used they also hunted down some pretty esoteric equipment in order to capture that unmistakable Blondie sound.

"Chris's basement was an unusual choice," admits Craig Leon, "but it worked very well because it gave us the freedom to experiment. We weren't on a shoe-string budget — far from it. Basically the budget was whatever it took to make the record. But when you are paying £1,000 a day for a top studio you do become very aware of the clock ticking, and this in itself can be a bar to creativity. What the band wanted was a comfortable, relaxed atmosphere, and they felt the best place to find that was at Chris's house, so that's where we did it."

How The Project Began

Craig Leon's relationship with Blondie is almost as old as the band itself, and included producing their first two albums — for the full story see the 'Ancient History' box on page 164. During the years that Chris Stein was ill, Leon stayed in touch with drummer Clem Burke and keyboard player Jimmy Destri, and actually worked with Clem Burke on a number of other projects, the most recent of which was the Mark Owen album he recorded last year with John Leckie.

More than 15 years after the release of their last album, *The Hunter*, four of the original members of Blondie are about to make a comeback with a brand-new album due out early in the New Year. Long-time friend and producer Craig Leon tells **Sue Sillitoe** how this latest offering was recorded.

"Through Clem and Jimmy, I was in touch with the band during the 1980s. I'd see Debbie every now and then and we'd always say that one day we would get back into the studio and do another album," he says.

Of course for many years Chris Stein was simply too sick to even contemplate a return to work. Leon says, "Chris is a very resilient man but he was incredibly ill and in a great deal of pain. It wasn't until he began to recover that the band started talking seriously about doing some more recording, and even at that stage I still thought it would never happen."

But then last year, during the Mark Owen sessions, Leon met the top brass from Leftbank, the management company that Blondie had just signed with, and they asked him if he would be willing to produce a few tracks.

He says, "Initially they only wanted me to do a couple of tracks, on the basis that they were going to use a variety of producers. But we ended up doing 14 tracks and we are planning to do a couple more for some future release. Just what will end up on this album has still to be decided because we haven't mastered it yet."

In true rock & roll style, once Blondie had signed a new distribution deal with BMG they called Leon and asked him to be in New York to start recording within a matter of days. "As they had waited nearly 15 years since their last album I couldn't quite see the urgency," he laughs, "so I finished the project I was working on and



Craig Leon
at his home
studio in the UK.

RECORDING BLONDIE

► went over a few weeks later. During that time I tackled Chris to see how we were going to approach the project, and that was when he suggested recording the album at home. He had quite a good studio setup in his basement because he had bought the contents of Blank Studios in New York when it closed during the 1980s. He told me that this included an old MCI desk and various other bits and pieces, but when I actually arrived at his house a few weeks later, even I was surprised at what he had in there."

Stein's accumulation of gear included a 40-in 24-out MCI 600 console, an MCI JH24 multitrack, a Linn 9000 sampler/sequencer, a pair of JBL 4311 monitors, a pair of Tannoy powered monitors, a pair of Yamaha NS10s and various delays, guitar effects boxes and samplers, plus some sequencers that he was using for composing.

"It was bit above your average home studio," says Leon, "but what was great was that it was very similar to the setup I use in the UK. This includes an MCI 500 console and an MCI JH24, but I've augmented my setup with a whole load of modern gear that I've accumulated over the years. I usually use *Cubase* as a sequencer and a starting point for writing and arrangements. And I've now got a 24-track Otari RADAR hard disk recorder that I absolutely love — to the extent that I can't imagine making a modern record without it. The best thing about RADAR is that it's a technological device that doesn't sound digital. To me this is important, because I love the old analogue sounds and would never want to work exclusively in the digital domain. I certainly wouldn't want to do drums digitally, because I don't think digital can provide the right depth and clarity at the top end. But we used RADAR for pretty much everything else."

Because Chris Stein's home studio complimented Craig Leon's, he didn't need to worry about shipping too much gear over to New York. He says, "I took over my RADAR and my Yamaha O2R, which I use mainly for monitoring. This is a really efficient, reliable, inexpensive means of monitoring in remote-recording situations because it adds very little, if any, sound coloration. It's useful, too, and has a lot of features that you wouldn't expect at its price. On the Blondie project we used it primarily for monitoring and bouncing down tracks digitally once they were recorded and transferred to the RADAR. Our inputs were pretty much analogue, so we didn't use the mic amps of the O2R all that much. However, there have been other occasions where I have used the mic amp side of the O2R and have found it quite effective. I've also done a few remixes on it at home and found it more than adequate for that sort of thing."

Apart from the RADAR and O2R, Leon also shipped over a selection of standard microphones including a Neumann U87, a pair of AKG 414s, a Shure SM7 and SM57 and a pair of Sennheiser 412s. Through an equipment dealer called Michael Block in Philadelphia, Leon managed to locate a 12-in, 4-out Studer Mark 3 recording console with



Above: Craig's equipment in his own home studio.

Left to right, top to bottom: Kurzweil K1000 keyboard, Alesis Midiverb reverb unit, Electrovoice Sentry 100A monitors, Otari RADAR digital recorder, Yamaha O2R digital mixer, MOTU MIDI Timepiece, Tascam DA20 DAT recorder, Eventide H3000SE Ultra-harmoniser/multi-effects, dbx 160A compressor (x2), Akai ME35T Audio/MIDI trigger, Akai S1000 sampler, Apple Macintosh computer.

four Studer compressors, two Neve 1073 equalisers, a very early stereo AI Smart compressor and a UREI 1176 compressor.

He says, "Michael Block deals in esoteric old equipment and was very useful when it came to finding some of the more unusual items that we needed. I wanted the Studer console because I'd used it before on one of my wife's projects and I knew it sounded really good on alto voices. I was also after the first AI Smart compressor that I wanted to use over the stereo mix buss. Michael also supplied a few vintage valve mics, but we didn't use them in the end."

As well as his MCI desk, Stein also had a whole array of esoteric synths and hardware sequencers, including an old Roland rhythm composer. "Chris loves that thing and had written a lot of ideas on it, so I took MIDI out of it and was able to incorporate everything he'd done on it into the sessions," Leon explains.

Alongside the Roland rhythm composer, Chris Stein was also using an old Linn 9000 as a writing tool — a method of working that Leon describes as idiosyncratic but perfectly effective. "Chris is very technologically oriented but in a bizarre way. He was using his Linn 9000 to make up very long loops, and we used these as a starting point. We also used some of Jimmy Destri's compositions which had been done on a Kurzweil 2500 sequencer — another really fiddly piece of gear, but one that had a great sound. So basically we started the project with hundreds of bits and pieces. I loaded all the loops through MIDI, then put them on the RADAR and got the band to play live to them. We didn't use any sequencers on the actual record — it was all done live."

Work on the album began almost as soon as Craig Leon arrived in New York. "It was just like the ►



Above: Craig with Debbie Harry in Chris's basement studio in New York, where much of the new Blondie album was recorded.

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RECORDING BLONDIE

► old days," he laughs. "They had quite a lot of stuff already written, but most of it mutated radically in the pre-production stages. We started out with a pile of stuff ranging from complete, finished songs through to little bits and pieces of ideas that they were keen to do something with. At that stage we had no vocals because that's how Blondie tends to work (see box below for more on this). Sometimes the melodies are written very early on, but most of the time they are not. Leon adds that the initial confusion was all part of the fun, because any song could be remixed at any stage and turned into something completely different. "What tended to happen was that each song would gradually shape up into a version that everyone liked. It wasn't so much a committee decision — just an instinctive feeling that we were on the right track."

The Basement And Beyond

With so many ideas to work with, Craig Leon decided that the best approach was set the band up in the basement, bring in a session bass player and gradually start going through the material until something began to take shape.

He explains, "We put everything we did on the RADAR, and at the end of each day I'd go through it and see what we wanted to keep. After about a month we had worked up about 25 ideas, some of which were very much like the original demos and some that had mutated into completely different songs.

"Once we had all that, we began to move quite quickly. I had rehearsal versions of the band playing to the MIDI which I then dropped out, leaving only a click. From there, we worked the ideas up into live arrangements with the whole band, then we moved into Electric Lady studios for eight days so that we could do the drums. There was no way I was going to record the drums in Chris's basement, because it just wouldn't have worked."

At Electric Lady, the band played live using a guide keyboard to represent the MIDI sounds. Leon says, "We used Electric Lady to record bass, drums and two guitars. We ended up mutating everything we recorded there, including the drums, which I put back into the RADAR so I could move them around. After that, it was back to the basement to put on the finalised bass parts, some of which were a composite of the rehearsal sessions and the recordings we made at Electric Lady. We did the same thing with guitars. With Chris' guitars we were recording virtually a riff at a time before deciding where they should be in the song."

While the band were at Electric Lady, Leon still had no vocals to work with, although he had an idea of the key of each song because he'd been working with Debbie Harry to get at least that much sorted out.

He says, "Chris and Jimmy have some lyrical input, but Debbie has the final say because it is her lyrical stance that defines the band. The process starts with Chris and Debbie listening to the backing tapes and coming up with melody



lines and the odd word — just snippets really. Then Debbie takes the tape away and writes the full lyrics, and soon after that we put the vocals on.

"Once we had the vocal melodies, she worked very fast — she certainly doesn't fool around. She knows what she wants and will do lead vocals for the whole album over the course of two or three sessions. We worked background vocals in later, using a sort of layering process. Then it was just a question of going through everything and ironing out what we had on each track."

The vocals were recorded in Chris Stein's basement, in a makeshift booth that was literally a cubbyhole lined with cheap acoustic panels and a few curtains to deaden the sound. "There was nothing technical or expensive about it — we just used the cheapest stuff we could find," Leon says. "Later we re-did some of them at Chung King — not so much for the sonics but because Debbie had written new lyrics. We also used Chung King to record a horn section and re-record some of Chris's guitars where we felt we needed a big room sound. The basement was fine for virtually everything but with the horns in particular the sound was too direct, and there wasn't enough air."

The main vocals were recorded with a

Blondie founder member Chris Stein, left, with Craig Leon and Leon's wife and assistant Cassell Webb, (a recording artist in her own right). Also visible are Stein's MCI desk, Leon's RADAR and O2R, and other equipment including a Roland JD800 and JP8000.

Songwriting The Blondie Way

Although Blondie's early hits are rightly regarded as classic pop songs, the band's composition technique is highly experimental, as Leon explains. "Chris and Debbie's background is very much tied in with Warhol and William Burroughs. During the 1960s, Burroughs worked with two composers in Tangiers — Paul Bowles and Brion Gysin — and they came up with a technique called cut-ups. Basically, they would record on a Nagra tape recorder, chop everything up and then put it back together again as different arrangements with Burroughs talking over the top. Chris has collected quite a few of these works and has incorporated this sort of cut-up technique into the way Blondie records. The only other artists I know who work this way are David Bowie and, to an extent, David Byrne.

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technique before it can seem very confusing, as you certainly can't produce this type of music in a conventional way. You don't say right, let's put a hook line here, because to begin with you have more hook lines than you know what to do with and very little substance. The music develops gradually, with the band making decisions about what they want to keep as they go along. It sounds crazy but with Blondie it works really well, because what you get are these very groove-oriented Phil Spector kind of tracks with lots of instrumental hooks.

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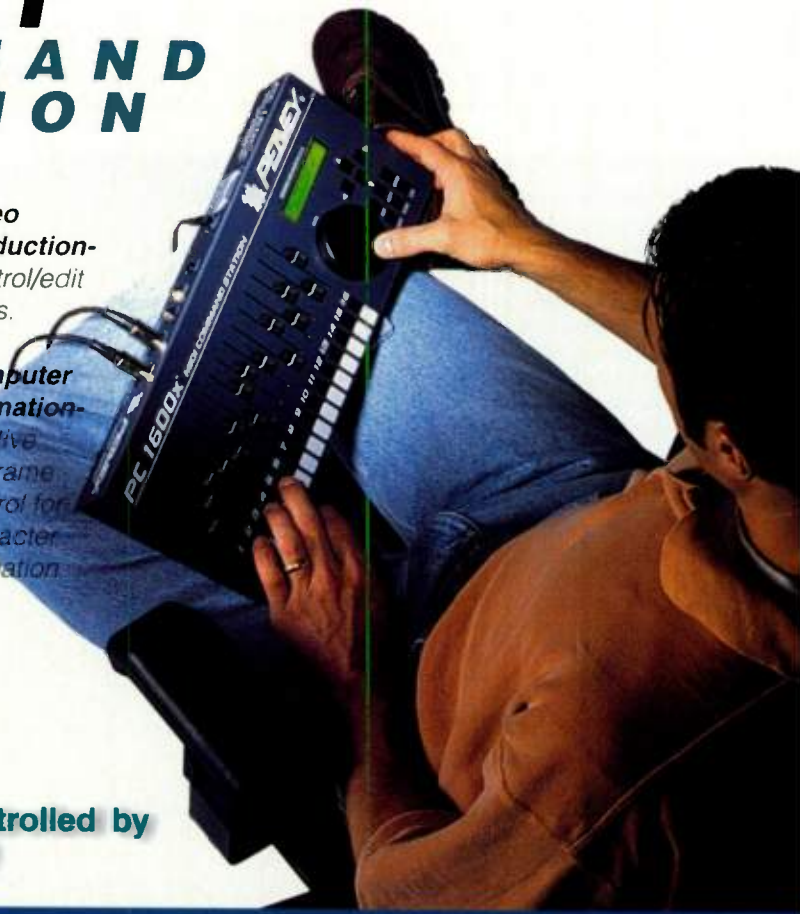
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Mixing And Monitoring

All producers have their favourite monitors, and Craig Leon is no exception. At home he uses EV Sentry 100 nearfields, but he didn't take them to New York because he was happy to hire in.

He says, "In Chris's studio we had a fairly nasty old pair of Yamaha NS10s and some JBL 4311s, plus a pair of self-powered Tannoys that we hired. At Electric Lady I used EVs and Tannoys as main monitors and Pro Acs as nearfields, while at Chung King I used Pro Acs, the proper NS10s as nearfields and a custom-built Dynaudio Acoustics system as the big guys. I really liked the Dynaudios and we used them a lot, especially when we went back to Chung King to mix."

The bulk of the album was mixed at Chung King using a Neve Capricorn digital desk. Leon says, "What I like about digital is that you can recall everything so easily that nothing has to be final until the very last minute. The technology is so flexible that if you are doing everything properly, you can change almost anything right up to the moment of release. Let's face it, these days

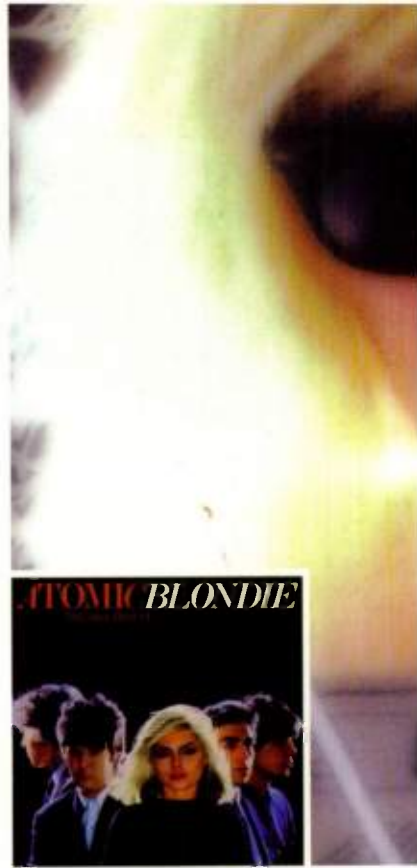
you can master off a Pro Tools system. In fact you can actually take a RADAR into the mastering facility and change your record as the engineers are working on it."

With the Blondie album, Leon tried to use very little EQ in the mix, because he prefers to do things in stages — not over-EQing in the beginning, but fine-tuning as he goes along. "As part of this process I ran certain things back through a Focusrite console, which is a fiddly desk but has a great sound," he says.

Leon says he picks studios on the basis of the live room and atmosphere, not the desk. "I'm not a gear head and I'm just as happy working on an SSL, a Neve or a Focusrite so long as the atmosphere in the studio is right. If you get the right music and the right feel it doesn't matter what equipment you use, because in the end the equipment is only a tool. I might make an exception for monitors as that choice is very personal, but in terms of the desk, it really doesn't matter what I use. After all, if I don't like the EQ, I can always bring in my own."

So What Comes After Blondie?

Given Craig Leon's production credits, which include The Fall, Jesus Jones, The Pogues, The Levellers, Flesh For Lulu and many, many more, it's easy to forget that he is also an artist and composer in his own right, with three albums to his credit. Now that he has virtually completed the Blondie project, he is thinking about the future and what to do next. First on the agenda is a recording for Decca Records which involves working with a



Blondie's recent 'greatest hits' compilation *Atomic*.

Ancient History

Craig Leon's association with Blondie extends right back to their earliest days as a struggling New York art-rock band, when he was influential in getting them their first record deal. Together with producer Richard Gottehrer, Leon was behind the band's first two albums, *Blondie* and *Plastic Letters*, released in 1976 and 1977 respectively.

Leon explains: "I'm originally from Florida, and that was where I got my first job in the music business — at Criteria Records, working on R&B projects with people like Alex Sadkin, who was a mastering engineer at Criteria before he moved into production with bands like Duran Duran."

"In the early 1970s I built a little studio in Florida which was mainly used as a demo facility. Richard Gottehrer, who owned Sire Records with Seymour Steln, came down to listen to some demos I had done for The Climax Blues Band and was sufficiently impressed that he offered me a job in New York working in Sire's A&R department."

Having Craig Leon on board worked very well for Sire, because he was responsible for discovering and signing

a number of early New York punk bands, including Talking Heads and The Ramones.

"I produced the first Ramones album, and also concentrated on licensing adventurous European records that the majors were unwilling to release in the US. It was a good period for me because I learned a great deal — not least the skills I really needed for production, which was eventually the direction I decided to go in."

It was while he was working at Sire that Leon discovered CBGBs, a biker's bar in a rough area of New York that had become popular with bands like Talking Heads and The Ramones. He says, "I initially went to CBGBs because I was trying to sign Patti Smith. She went with Arista because they were a much bigger label, but while chasing her I noticed that there were all these other bands playing at CBGBs so I started going there regularly to check them out."

"One of these bands was Blondie and although they were very chaotic and sloppy, I really liked them. I just couldn't get Sire to sign them because, to put it quaintly, they were

incredibly rough around the edges."

As time passed and the Punk scene took off, many of the other bands playing CBGBs found themselves record deals. But Blondie continued to be overlooked. Eventually, Richard Gottehrer left Sire and set up a production company called Instant Records with Craig Leon and Marty Thau. At about this time Hilly Kristal, who owned CBGBs, put up the cash to record a *Live At CBGBs* album and asked Leon to produce it.

Leon says, "Blondie was begging to be on that album, so every night when I soundchecked our equipment I did a Blondie set, because they lived right across the street and were literally always available. While I was doing this I was becoming more and more convinced about the band — particularly Debbie, who I thought was fantastic. One night when we were working in the remote truck, Richard Gottehrer called in to pay a visit. He heard the Blondie set and later met Debbie, who managed to persuade him to put up the money to record one single. I was given the job of getting it on tape."

"That turned into about a six-month process of routing every song they came up with, because no matter what

we did we just couldn't get them a record deal. Basically, by the time they did get a deal, they already had enough material in the can for three albums. We had about 40 tracks, most of which ended up on the first and second albums. Some of it even ended up on *Parallel Lines*, the third album they recorded with Mike Chapman in 1978. 'Heart of Glass', for example, was recorded very early on. It just didn't have any lyrics at that stage."

At first glance, Blondie's chaotic and haphazard early years might not seem particularly relevant to their most recent project, but according to Leon it was their idiosyncratic roots that spawned the recording styles and techniques used on *No Exit*.

He explains, "Blondie has always worked in a totally unique way — one that might seem pretty modern now, but was very unusual back in the early 1970s. At that point there were very few 'studio' bands as such, because most bands were just recording 'live'. But Blondie were different. They were attempting to record as a layering and sampling band before there were even samplers. They would do a riff and we would work that into a verse. Then they would do another riff and we'd work that into a chorus. Then we'd



new vocalist, Isobel Cooper. Other plans in the pipeline include completion of an album for Virgin artist Cassell Webb, who also happens to be Leon's wife, although with the Decca project now looming he expects Cassell's album to go on hold for a while.

With a background steeped in punk, indie labels and alternative music, it's not surprising to learn that Leon mourns the death of the truly independent record label — the kind of label that was once prepared to take a risk on something a little more experimental.

"I'm desperate to find that kind of label now," he says. "What I'd like to see are a few more labels that are prepared to take a chance on something new, and perhaps allow producers like myself to

work with bands experimentally in the way I originally worked with Blondie. Unfortunately, the problem isn't just with the labels. The bands themselves are often reluctant to work experimentally because it is such a long process. They want deals immediately — even when they only have three songs."

However, Leon is undeterred and is now actively hunting for artists that are a little off the beaten track. "A number of publishers are responding to my requests, and I'm finding some interesting sounds," he adds. Whether he finds anything worth recording remains to be seen, but one thing's for sure — if there's another band with as much potential as Blondie out there, then Craig Leon's just the man to spot it. **SOS**

chop them together, mix them about and arrange them into a whole track. After that, Debbie would take the track away and come back a couple of days later with the lyrics. We were bagging studio time everywhere we could — mostly at Plaza Sound in New York, which doesn't exist anymore, and also at Bell Sound which is now Walter Seer Studios, and Electric Lady which we revisited when we recorded the new album.

"Most of what we did back then — the routing and so on — was done in the loft at The Bowery. This was a very rough building where the band were also living. In fact it was so rough that you literally wouldn't know if the body in the hallway was drunk or dead. We used to rehearse there and routine the songs before moving into a studio to lay the tracks down. I think it is partly because of this background that the band has no qualms about working at home. After all, they were well used to the concept, because in the early days they didn't have the money to do otherwise."

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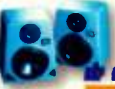


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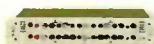
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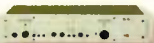
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spirit

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SPIRIT 328 8-BUSS DIGITAL MIXER

Spirit's 328 is a digital mixer designed to retain the intuitive feel of an analogue desk. **Paul White** takes the controls, while **Hugh Robjohns** explores the 328's comprehensive digital interfacing.

Since its announcement one and a half years ago, Spirit's long-awaited 328 digital recording console has attracted a great deal of interest, not least due to its unique user interface. Other digital mixers have tended to cut down on the numbers of physical knobs and sliders, instead employing menu systems which can make them less than intuitive to those used to traditional analogue desks. Spirit, however, have tried to take a slightly different approach which emulates more closely the familiar in-line analogue console paradigm. The 328, unlike most digital mixers, doesn't have a TV-sized LCD window. Instead, there's the kind of two-line display that would be more at home on an effects unit, but this isn't purely a cost saving — the designers say it's because so few functions need a display at all.

In addition to the friendly user interface, Spirit have also included as standard the sort of interfacing capabilities normally sold as optional add-ons. For example, both Alesis ADAT and Tascam's TDIF connections are provided for use with 16 tracks of MDM (Modular Digital Multitrack) or any other recording system using a compatible interface, and there's also AES-EBU and S/PDIF in and out, word clock in and out, and an RS422 port for connection to computers or other professional equipment that uses the Sony 9-pin protocol. There's even an additional ADAT-format aux output — see the 'Digital Facilities' box for more details on the digital I/O.

The mixer, which has an internal mains power supply, is around the same physical size as a small

16:8:16:2 analogue console, and indeed that's the configuration it emulates. The digital connections are located on the rear panel along with MIDI In, Out and Thru sockets. Because all the to and from tape connections are digital (I use the term tape in its generic sense here, as the mixer is equally at home with tapeless recorders), this isn't the obvious choice of mixer if you want to run an analogue open-reel machine, but having the digital interfacing built in makes it quite cost-effective for users of ADAT- and DA88/38-compatible recording systems. For those who do need to use analogue machines, a sensibly priced 8-channel analogue I/O to TDIF converter is on the cards.

The 328 is arranged as an in-line mixer where channels 1 to 16 will normally be used to handle signals being recorded, though at mixdown, they can also be used to bring other sources into the mix. Channels 17 to 32 share the same channel strips and are fed from the digital inputs, so their normal function is as tape returns for monitoring during recording and for providing the main mix when mixing. As both sets of channels have essentially the same facilities, you don't end up sharing EQ and effects sends as you do with most analogue in-line consoles, so there's no need for a 'flip' switch.

All the analogue connections are on the top panel to allow easy access for those users without patchbays, and all 16 channel strips have balanced mic and balanced line inputs as well as insert points. However, it is vitally important at this stage to clarify exactly what the insert point does on a digital console like this one. The inserts are analogue, on TRS jacks, and come after the input amplifier but before analogue-to-digital conversion. This means compressors, gates or equalisers can be used with any of the analogue inputs at any time, but when it comes to mixing from the digital inputs, you're restricted to using the onboard dynamic processors or to patching an external connection via an unused effect send and a spare analogue input channel.

Unlike the Yamaha range of mixers that provide dynamics on just about every channel, output and return, the 328 has just two dynamics processors,





each of which can be configured to work in mono or stereo. Essentially, you pick a channel that will act as the side-chain feed for the compressor or gate, then decide which channels need to be compressed or gated.

There are two digital effects units running Lexicon algorithms, plus full moving-fader automation. Used in stand-alone mode, the automation is limited to snapshots (up to 100), but in conjunction with a MIDI sequencer, the automation is fully dynamic. Snapshot automation can be locked to SMPTE or MTC and mixer maps have been produced for *Cakewalk* and *Logic Audio*, and will appear on the Spirit web site shortly.

The Es Of Use

Before moving on, there's one further important concept to introduce — the E-Strip, a disarmingly simple but effective idea that is largely responsible for the 328's friendly interface. Leaving aside the big-bucks megastudio digital consoles, it's quite impractical to provide a dedicated knob for every function on a digital mixer, which usually leaves us navigating via data wheels and cursor buttons. The 328 uses these familiar devices to access features and functions that aren't needed on a regular basis, but when it comes to setting up a channel, the E-Strip is far more immediate.

Essentially, the E-Strip is a row of 16 rotary

SPIRIT 328



► encoders located above the faders, and it can be used in one of two ways: you can either have it set to control a single parameter, such as an aux send level or pan setting, for 16 channels at a time, or you can rotate your mind through 90 degrees and have it provide all the EQ, aux sends, effects sends and pan controls for the currently selected channel. Simply hit a channel's select button and the E-Strip functions just like the channel strip on a regular analogue console, with rings of LEDs around the controls to show the current settings. The equaliser Q controls display an arc of LEDs, the width of which corresponds to the bandwidth, and the EQ parameters are displayed numerically in the LCD window if you don't trust your ears. When the Q controls for the high and low EQ are turned to their widest settings, the LED patterns around the controls change and the response switches from bandpass to shelving.

There are two sets of Select buttons for each channel strip, one for the Mic/Line channel (1 to 16) and one for Tape (17 to 32). Similarly, three Fader Bank selector buttons are used to choose whether the 16 faders control the Mic/Line channels, the Tape channels or the buss and aux Masters. Each channel strip also incorporates a 10-segment level meter, and three further select buttons allow these to monitor the Mix/Line, Tape or Master levels. Considering that most other low-cost digital mixers have the meters set out only on one of the LCD display pages, having 16 meters constantly on view is quite a luxury. Two further meters monitor the stereo output level, and these also read gain reduction when setting up the dynamics processors. A fourth fader mode is being added to the software that allows the faders (motorised 100mm Panasonic devices) to be used to send MIDI data for controlling an external MIDI device or software package.

What's In A Channel?

Inputs 1 to 16 are equipped with XLR mic inputs, balanced jack line inputs, a gain trim pot and a 100Hz low-cut switch. Phase invert can be switched in for individual channels from the master section. The analogue controls are not programmable, but as a rule, if it lights up you can save it. All 32 channels have a three-band, fully parametric equaliser, four aux sends (switchable pre- or post-fader) and two further sends feeding the internal effects processors. Unlike my Yamaha 03D, which has a four-band parametric on each

channel, each band of which can be tuned over the entire audio frequency range, the 328's EQ section has been deliberately designed to emulate an analogue EQ, with the audio spectrum being divided into separate overlapping bands, and the high and low bands able to be set to parametric or shelving. This provides a more familiar feel to the controls, and the EQ algorithms have a surprisingly analogue sound which many will welcome.

At the bottom of each channel strip are the two Select buttons for Mic/Line and Tape, plus a Mute button and a Solo button which works in either PFL (pre-fade listen) or SIP (solo-in-place) mode depending on how Solo is set up in the master section. A Solo Safe mode is also included which allows specified channels to remain on when another channel is soloed. This is useful for hearing a soloed channel complete with effects.

Each channel may be routed to 'tape' via the eight busses or via a direct output system where any channel can be made to feed the correspondingly numbered tape track. The 328 can accommodate up to 24 tracks of digital recording by using the Groups along with the direct channel outs, and though there are only 16 digital tape return channels, it would be possible to perform 24-track mixdown (or even 32 come to that) by bringing additional tracks into the mixer via the analogue channels. This would also provide an opportunity to use the insert points on the analogue channels. Channel data can be copied to a different channel, but at the moment, there's no facility to link adjacent channels as stereo pairs, though I'm assured this has already been remedied and will be included in an imminent software revision.

Also located within the channel strip, but not strictly speaking a part of it, is an MMC record status LED. By using the Rec Arm button in the master section, individual channel Select buttons may be used to put up to 16 tracks of external MMC-controlled recorder into record-ready mode.

One potential problem with mixing consoles is that you never seem to have enough stereo inputs to ►

The 328's innovative E-Strip can provide comprehensive control over one channel, or simultaneous control of one feature, such as aux level or pan, on 16 channels.

SPIRIT 328 £3524

pros

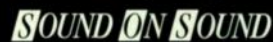
- Excellent digital I/O implementation.
- Generous number of analogue inputs.
- Extremely intuitive user interface with long faders.
- Good sound quality with very analogue-like EQ.

cons

- Dynamic automation relies on an external sequencer.
- Only two onboard dynamics processors.
- No insert points in the tape return path.

summary

This is one digital console that shouldn't frighten away those brought up on analogue mixers. Though there are some problems with the dynamic automation, the imminent software revision should improve matters significantly.

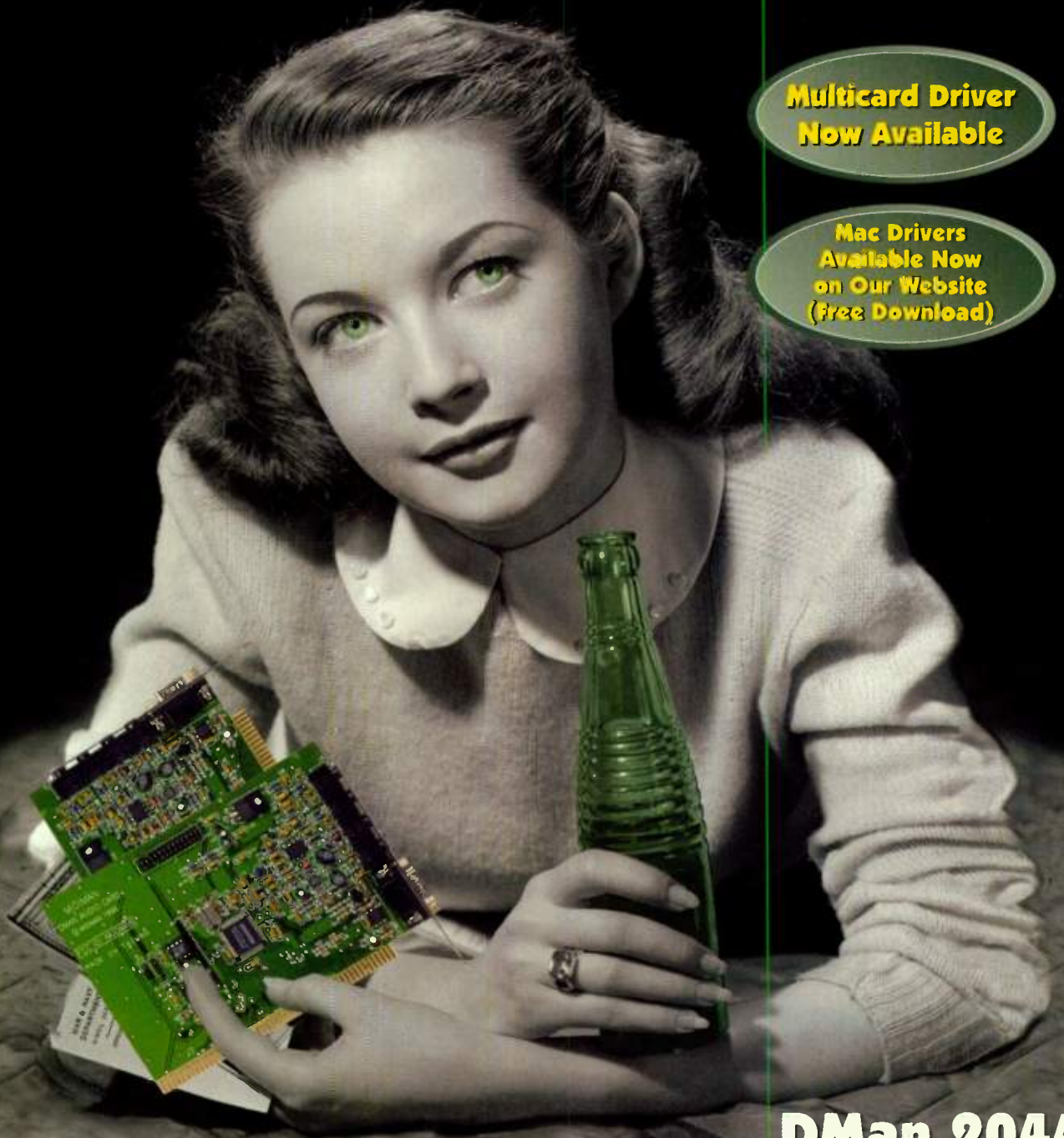


“All 32-channels have a three-band, fully parametric equaliser, four aux sends (switchable pre- or post-fader) and two further sends feeding the internal effects processors.”

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World Radio History

SPIRIT 328

► cope with all those odd external effects returns or synths you want to run into the mix. Spirit have got around this quite neatly by building what is in effect an analogue 'levels only' submixer into the 328's master section, combining four stereo analogue inputs into one before digitisation. In addition, a second stereo analogue input path is provided, this time with just one pair of input jacks, and again with its own level control. I imagine the idea of separating the first group of four inputs is to make them available as effects returns to handle anything that might be connected to the four aux sends, but in reality, any line-level input signal can be fed into the mix via any of these analogue inputs. All the tape returns and the two sets of stereo inputs have the same routing facilities as the main input channels, as well as access to EQ and aux sends.

Master Section

The analogue paradigm has been carried over to the master section, where there are inputs for two separate 2-track recorders and monitor selection between Mix and 2 Trk, as well as a monitor Dim button. At the top of the section are rotary controls for all the analogue ins and outs, for the 2-track tape returns, control room, aux sends and the stereo inputs. Stereo input STE 1 has four stereo inputs that are mixed into one stereo pair with a level control for each, while STE 2 has a single pair of inputs. Either of these stereo ins may be fed from the AES-EBU digital interface, if required, and the stereo mix can also be sent out over AES-EBU. In the present software version, it isn't possible to use the AES-EBU input as the 2-track return, which seems a little remiss given the number of DAT machines out there, but this is due to be remedied in the imminent software revision.

The centre panel contains the two-line backlit liquid crystal display, below which are four cursor buttons and a rotary encoder for parameter editing. A Confirm/Yes button functions as an enter key, and there are Undo and Redo buttons that allow you to go back one step if you've made a mistake. A clear SMPTE readout is used to monitor the incoming timecode when the

"Aside from being easy to use, the sound quality is really very good, the EQ is reassuringly musical, and the provision of ADAT and TDIF (16 tracks, no less) plus AES-EBU and S/PDIF digital interfacing as standard is excellent."

Specifications

Frequency Response:	10Hz to 22kHz +/- 0.5dB.
Dynamic Range:	Mic In 109dB, Stereo inputs 112dB.
A to D and D to A Converters:	24-bit with 128-times oversampling.
Internal Processing:	24-bit, 56-bit.
Sample Rate:	44.1kHz/48kHz user-selectable.
LF Parametric EQ:	Sweep/shelf 40Hz to 800Hz, Q 0.7 to 2.8, +/-15dB range.
MID Parametric EQ:	Sweep 200Hz to 8kHz, Q 0.7 to 2.8, +/-15dB range.
HF Parametric EQ:	Sweep/shelf 1kHz to 20kHz, Q 0.7 to 2.8, +/-15dB range.
Effects:	2 x Lexicon processors, up to 10 editable parameters per effect.
Dynamics:	Two assignable mono or stereo processors offering compressor, limiter and gate.
Analogue Inputs:	16 mono mic/line channels, five stereo line inputs and two stereo tape machine inputs.
Digital I/O:	2 x 8-track ADAT and TDIF connectors, plus one ADAT aux input. AES-EBU (XLR) and S/PDIF (phono) in and out. See 'Digital Facilities' box for more information.
Sync:	SMPTE or MTC.
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DISTRIBUTION

SPIRIT 328

► automation is being sync'ed to an outside source (MTC or SMPTE), and a set of five MMC transport and locate buttons are provided for remote control of any MMC-compatible device. These work in conjunction with the 'record arm' LEDs in the channel strips, and include two locate memories.

Most of the smaller digital consoles I've looked at make really heavy weather of signal routing, but again Spirit's designers have really thought the problem through. Instead of having to visit menu-land, they've provided eight Group routing buttons. Holding down one of these allows you to use the channel Select buttons to route or unroute any channels to that destination. Pressing and holding the routing button again puts the console into Query mode, which causes the Select buttons of any routed channels to light up, so you can interrogate the routing at a glance. In fact, this same philosophy has been carried over to the Phase, Direct Out, EQ In, SIP Safe, Route to Mix, Rec Arm, Mute and Solo functions, so that pressing a single button in the master section can show the status of the entire mixer for the selected function. There are also buttons for setting up the Solo status and for storing, recalling and stepping through (Next) snapshots.

Both effects generators have rotary level encoders plus Select buttons, and may be routed to the same destinations as the channels, though not to themselves. A library of effects and dynamics treatments is included, and these may be edited very easily using the data wheel, display and cursor buttons. Pressing and holding the Dynamics button by the main stereo meters allows the dynamics processor to be assigned to one or more channels (including the stereo inputs and effects returns), while the side-chain source is selected using the display, cursors and data wheel. It's also possible to assign a dynamics processor to the stereo output, but not the the group outputs.

The dynamics section provides a choice of gate, compressor, compressor/gate, limiter or limiter/gate, where the compressor may be set to hard- or soft-knee. All the usual parameters are editable including attack and release times, threshold, gate depth, gate hold, compression ratio, makeup gain and so on. These parameters are accessible as a simple list in the display window. Selecting the Dynamics button next to the main meters changes them to gain-reduction meters with the gate open/closed status being registered by the red LED at the top of the meter. Pressed the button again exits this mode.

The effects section comes with 112 editable presets ranging from straight reverbs and delays to combination delay/chorus and multi-echo effects. The amount of editing is reasonably comprehensive (it goes beyond the usual decay time, pre-delay, HF roll-off), and edited patches can be stored in one of 128 user memories.

Automation

Automation is what digital desks are really all about, and the simplest level of automation is the



Because there are no menus to navigate, the 328 has only a two-line LCD display.

Digital Facilities

The digital processing and interfacing side of the Spirit 328 is extremely well specified. For example, all of the analogue-to-digital and digital-to-analogue converters use 24-bit delta-sigma designs operating with 128 times oversampling. The internal signal processing hardware provides full 24-bit resolution, with 56-bit busses.

Interfacing the console digitally to tape or disk recorders is pretty flexible — In fact I would suggest that the 328 is the present market leader in this respect. Facilities are provided for two simultaneous 8-track digital recorders with full send and return connectivity normalised to channels 17-24 and 25-32. The 328 is one of the few digital desks which provides both ADAT optical and TDIF interfaces as standard — not as plug-in options — and the provision of both interfaces permits easy format conversion. The software menu system determines which I/O port format is in use as well as providing a very useful +/- 10dB return level trim for each channel.

A very unusual facility is the menu option to adjust the phase of the audio data on the TDIF port relative to the desk's word clock output.

The phase adjust in the Clock Source menu addresses issues raised when working with two Tascam units, where one is fitted with an old sync card and the other with a new sync card. The ability to adjust the phase guarantees that both units are stably synchronised when transferring data to and from the Digital 328. Spirit have developed a special sync cable that will be available to those users whose setup contains two of the older Tascam units.

The TDIF output can send 16, 20 or 24 bits, the appropriate option being determined automatically to match the number of bits received on the corresponding TDIF Input port. Although the clock signal within the TDIF connector is checked to ascertain whether synchronisation has been achieved, the desk relies on separate word clock signals to operate correctly with DTRS machines.

The relative phase between the ADAT port and the word clock is not adjustable, but the output word length can be manually configured for 16 (default), 20 or 24 bits (with appropriate dithering on the shorter word lengths). The ADAT Input receives 24 bits and relies on the source machine to set unused bits to zero.

“There’s a lot to like about the 328, and I believe the design of the user interface sets the standard for ease of use in the small digital mixer market.”

snapshot. A snapshot records all the console settings, with exception of the analogue input gain controls and the high-pass filter status — anything that shows up on the E-Strip is saved as part of a snapshot along with routing and the currently selected effects and dynamics processors. To store the current state of the console as a snapshot in the current memory location, it’s necessary only to press the Store key in the Snapshots section of the console. If memory mode is selected in the display, the data wheel can be used to scroll to any snapshot location prior to saving. The same data wheel is used to select snapshots for recall using the Recall button. Snapshots may be named with up to 12 characters, and recall can be automated against SMPTE, MTC, MIDI Clock or MIDI Program Changes. In a simple mix, where all you need is a change of mix between verses or between verses and choruses, snapshot automation may be all that’s required. Master console settings such as sample-rate and tape-machine selection are not stored within a snapshot, though there are 27 user setup memories that can be used to store this information.

Dynamic automation is more useful when you have a mix that involves constant balance changes or fades. Once Automation Setup is selected in the LCD window, MIDI information (NRPNs) is sent on a single MIDI channel via the console’s MIDI Out whenever a fader or rotary encoder control is moved. This data may be recorded directly into a

MIDI sequencer, and a full listing of the data is provided in the manual. This way of working only records changes to the console setup — no MIDI data other than the least significant bit (LSB) is sent until a change is made (to keep the MIDI data stream density under control) and, for this reason, a starting snapshot must be created for each song. Subsequent automation moves effectively modify this snapshot. If the song is not always going to be played from the beginning, this method of working means you’ll have to create other snapshots throughout the song so that if you stop the mix, you only have to wind back as far as the previous snapshot. Clearly this isn’t quite as convenient as having built-in dynamic automation that lets you start and stop anywhere you like during a mix, but it works.

The 328 currently has four dynamic automation modes, the first three of which are Read, Write and Update. Read mode allows automation data to be played back from a sequencer, while Write is selected when you’re recording automation data. Update mode is used to modify mix data — in this mode, the external MIDI information controls the mix (Read mode) until a fader or control is moved, at which point those controls are switched into Write and remain there until the pass is finished. Any unmoved controls remain in Read mode. In practice, the automation is still a little clumsy as you have to switch between Read and Write modes via the LCD window, and fast fader moves tended to gum up the data stream, at least with my budget MIDI interface. Spirit are aware of this and are planning extensive improvements in this area via free software upgrades. Fortunately, the 328 can be updated from floppy using a Mac or PC — there’s no need to send it away or to pull it apart.

Finally comes Remote mode, in which MIDI data

A third extra ADAT optical output provides menu-selectable feeds of auxiliaries 1-4, FX 1 and 2, the stereo mix buss, or the group busses.

Both flavours of stereo digital I/O are present: an AES-EBU input and output pair on XLRs is complemented by an S/PDIF input and output pair on phono sockets (although either connector actually accepts data in both formats). The only apparent limitation in the implementation of these I/Os is that pre-emphasised audio data cannot be accommodated, so bad news for those still using Casio and TEAC portable DAT machines, or CDs which employ pre-emphasises. Perhaps a future software update can correct this anomaly?

The output ports can be independently selected to provide a mute signal, the stereo mix buss (default selection), auxiliaries 1 and 2, aux 3 and 4, or FX 1 and 2. It is a shame that specific channels’ direct outputs cannot be selected (to provide a feed of specific sources without having to tie up the aux sends), but according to Spirit the facility could easily be added should there be a demand for it — the benefits of DSP-based consoles! The output word length for each of the stereo I/Os is individually selectable between 16 (default), 20, or 24 bits, with appropriate dithering

on the shorter lengths.

On the review machine (running v1.0 software), the stereo digital input is of limited use though the v1.1 revision should remedy the problem I’m about to describe. Both of the stereo digital inputs can be independently routed through various signal paths within the desk: nowhere; STE-1 or -2 (ie. in place of the analogue stereo effects returns); or FX-1 or -2 (ie. in place of the Internal FX processor returns). By default, the AES-EBU input is routed to FX-1 and S/PDIF to FX-2, but all of the available routings end up on the main stereo mix buss. In a recording application, the DAT return is needed as a source to the control-room monitoring to check the recording, but currently there is no way either stereo digital input can be auditioned without going through the mix buss. Apparently v1.1 will provide a ‘two-track monitor’ option in the list of destinations!

Clocking options are as comprehensive as most other aspects of the 328 with internal options of 44.1 or 48kHz, plus external word clock inputs via a standard BNC socket, the AES-EBU or the S/PDIF inputs. The desk will lock to an external clock between 40 and 48kHz and the selected clock is available at the word clock output socket.

The specifications for the desk don’t mention internal clock accuracy, but subcode on the S/PDIF output indicates the clock as Level II (50ppm).

The S/PDIF data stream is inevitably burdened with SCMS codes, but Spirit have provided three category code options as well as both copyright modes. By default, the desk declares itself as a ‘Digital Mixer’ in the category code flags, but as many SCMS-equipped DAT machines don’t recognise this identification, the desk menu system provides alternative categories of ‘DAT Recorder’ (for systems that simply don’t recognise the mixer code), or ‘General’. There are also two copyright settings: ‘asserted’ means no further copies of the recording are allowed; and ‘not asserted’ which permits unlimited copies. Incoming category codes and copyright status from the S/PDIF input can be displayed, but are ignored.

Spirit say that the next software upgrade will include, in addition to the improvements already mentioned, dithering to the Optical Outputs and MIDI control of the FX and Dynamics processors, and they’re looking into the possibility of synchronisation to Digidesign Superclock.
Hugh Robjohns

SPIRIT 328



The 328's digital interfacing is probably the most comprehensive of any small digital mixer.

► is accepted from a remote controlling device such as a MIDI sequencer with a mixer map. This is similar to Read mode except that no MIDI data is sent from the 328. This mode would be the one to use when controlling the 328 entirely from a sequencer mixer map.

Using The 328

Once you've switched on, seen the light show and waited a minute for the operating system to load, finding your way around the 328 is largely intuitive, not least because of the excellent E-Strip and the rings of LEDs around the rotary encoders. Even so, the brief manual could be more helpful by working through examples of procedures you're likely to want to do. Routing, recording and EQ'ing is almost as simple as on an analogue desk, so no complaints there, and the 24-bit converters are extremely quiet and transparent. Noise-shaped dither can be applied when reducing the output signal for 16-bit in order to preserve the greatest possible dynamic range. The EQ section has a positive character but still sounds nicely analogue, and though the effects are arguably less sophisticated than those found on the Yamaha 01V and 03D, they're still perfectly adequate for the majority of applications. The dynamic processors are generally good and tend to have more 'attitude' than most digital compressors I've heard. However, having only two can be limiting (no pun intended), especially as you can't insert external signal processors.

Snapshot automation is straightforward and effective, and when the snapshot memory gets full, you can dump it to a sequencer or data file via MIDI SysEx. The ease of use of the dynamic automation depends largely on which sequencer you're using, as is invariably the case when it relies on an external MIDI sequencer. Mix edits have to be dealt with in the sequencer, and I also found that moving multiple faders or making fast moves tended to

“Finding your way around the 328 is largely intuitive, not least because of the excellent E-Strip and the rings of LEDs around the rotary encoders.”

produce more data than my system could comfortably handle, so some automation events got lost. Apparently this is because Spirit use a very high-resolution logarithmic mapping system which produces a lot of data, but they've already sussed that many sequencers can't deal with it and they're providing a less data-intensive linear alternative in the next software revision. Operationally, I didn't like having to switch from Write to Read mode manually using the display section every time I made an automation pass. Hopefully the next software revision will enable the software to automatically drop back into Read mode from Write whenever the timecode is stopped. I'd also welcome some means of using the channel Select buttons to put individual channels into Write mode from Read — a methodology that's familiar to most people who've already used desk automation.

Summary

There's a lot to like about the 328 and I believe the design of the user interface sets the standard for ease of use in the small digital mixer market. For me, the weakest areas are the limited number of dynamics processors (though they actually perform very well), and the reliance on an external sequencer for dynamic automation. My own view is that there's little excuse not to bring the automation on board apart perhaps from on the very cheapest digital mixers. These criticisms aside, the 328 is largely good news, and the ease with which the software can be updated means it can only get better in the future — v1.004 should be fitted to all shipping models by the time you read this review and v1.1 is in development. Aside from being easy to use, the sound quality is really very good, the EQ is reassuringly musical, and the provision of ADAT and TDIF (16 tracks, no less) plus AES-EBU and S/PDIF digital interfacing as standard is excellent. The inclusion of MMC control with track arming is also very welcome and there's a nice, clear timecode display. I'm also impressed by the generous number of analogue returns/line ins and the fact that two stereo machines are catered for as standard. Professionals will be impressed by the word clock in and out as well as Sony 9-pin compatibility, while the clear metering should win friends in all areas. Once Spirit have tightened up the automation side of this mixer (as v1.1 promises to do further), they should have a real winner in the 328. **SCS**

Optional Extras

- **8-Channel I/O:** this connects to the TDIF port to provide eight unbalanced analogue group or direct outputs and inputs.
- **AES-EBU Interface:** four pairs of AES-EBU digital ins and outs on XLRs. Connection is via the TDIF sockets.
- **Mic Preamp Interface:** provides eight additional mic inputs using the same low noise Ultramic preamps as in the 328. Each input has a gain control, high-pass filter, insert point, phase button and pad switch; connection is via the TDIF sockets.

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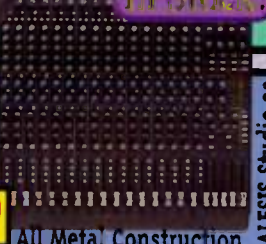
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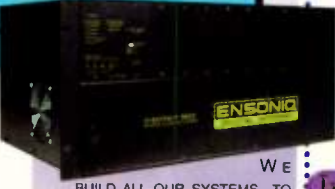
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ALESIS Q20

a few bits more



The original Alesis Quadraverb is, I'm told, one of the best selling multi-effects units of all time. The Quadraverb 2 or Q2 fared less well, however, possibly because it was viewed by many as being simply a revised Quadraverb at a much higher price. With hindsight, perhaps Alesis should have picked a different name, because the Q2 was a totally different device from the Quadraverb — even the 'Quadra' tag was misleading, because it allowed up to eight effects to be used in combination. Though it was still essentially a 16-bit device, the Q2 was much quieter and cleaner-sounding than the Quadraverb, and featured an elegant graphical interface that showed exactly how the various effect blocks were connected up. It also had an ADAT digital interface, which was unusual at the time.

The new Q20 is essentially a Q2 fitted with 20-bit converters, but it's also been improved in other areas, not least in having twice as many user memories. Gone is the annoying external power supply, and in addition to the ADAT interface, there's also S/PDIF in and out on standard phonsos. The input sockets are now combi XLRs that can accept balanced XLRs or regular quarter-inch balanced/unbalanced jacks, and the outputs are available on separate balanced XLRs or balanced jacks. There's also a 48kHz clock input, footswitch

ALESIS Q20 STEREO MULTI-EFFECTS UNIT

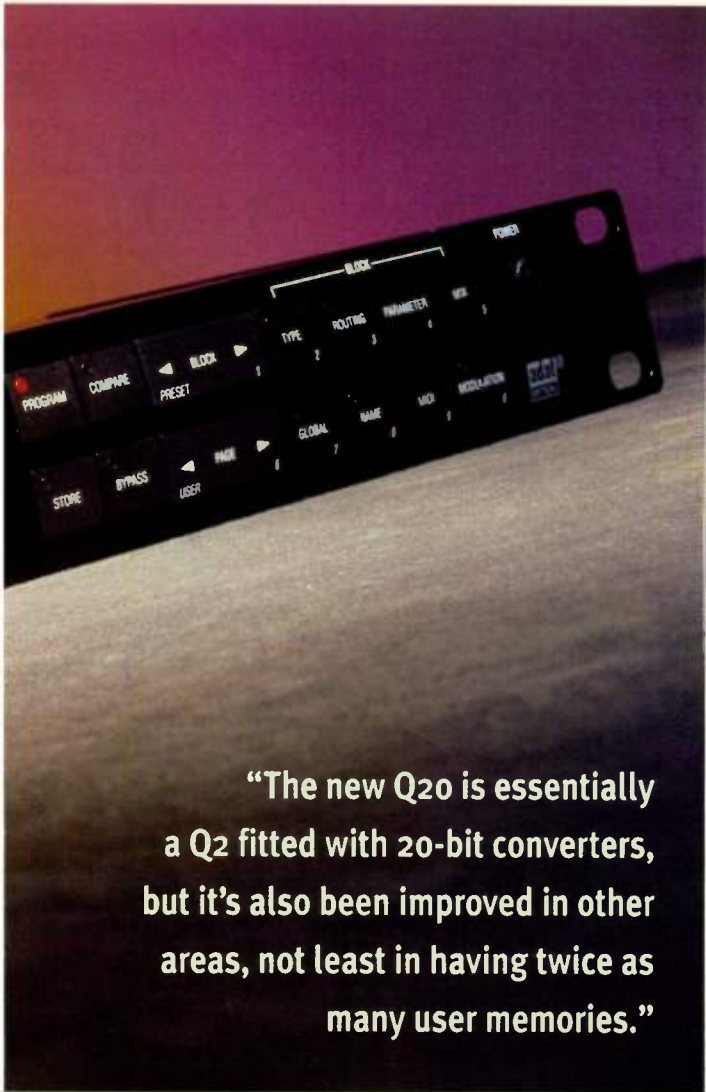
jacks for bypass and patch advance, and MIDI sockets for In and Out/Thru.

The effects are generated by the same proprietary 24-bit Alesis DSP chip as was used in the Q2 which, depending on the complexity of the effects chosen, can generate up to eight programmable effects blocks at once, though in most cases, only four or five typical effects can be combined before the DSP limit is reached. You can even use all the DSP power on one super reverb. I think it's fair to say that the high quality of the Q2's reverb went sadly unnoticed, and in its new 20-bit format, the Q20 reverb is even cleaner and smoother.

Set The Controls

The operating system of the Q20 is virtually identical to that of its predecessor, but for the benefit of those unfamiliar with the Q2, I'll quickly go over the basics. Housed in the familiar 1U case, the Q20 has a custom display, rotary controls for input and output levels, and a data wheel for patch selection or parameter changing. A dual bargraph meter shows the input level. Cursor style rocker buttons are used for Block and Page selection with just 12 other single

Paul White meets the latest version of Alesis' Quadraverb concept, and finds it resplendent with 20-bit I/O, improved digital and analogue interfacing, and a proper internal PSU.



“The new Q20 is essentially a Q2 fitted with 20-bit converters, but it’s also been improved in other areas, not least in having twice as many user memories.”

function buttons handling the rest of the navigation, and pressing the data wheel acts as an ‘Enter’ function. Operation really is so simple that most people could find their way around it fairly quickly without ever opening the manual, though because of the detailed display, it helps to have the unit where you can see it clearly. It’s also a good idea to read the manual through at least once as there are features that you may never suspect exist from simply looking at the front panel.

The effects occupying the blocks are divided into EQ, Pitch, Delay and Reverb, and further subdivided into over 50 effects type algorithms including hall, room and plate reverb, graphic and parametric EQ, flanging, chorus, pitch-shifting, delay, rotary speaker simulation, overdrive, Doppler autopananning and even stereo sampling. Blocks may be connected in any order, and the linking between blocks is shown by virtual patch cords in the display window. Each block has stereo outputs as well as a mono mix output and at nodes where signals are combined, the mix ratio can be set by the user. Routing is actually very simple as once you’ve selected a signal destination, you simply use the entry dial to scroll through the available sources and then pick the one you want. The display graphics change dynamically to follow this process so you can always see what you’ve got.

Creating or editing a patch involves selecting one of the blocks, then using the panel buttons to select Type, Routing, Parameter or Mix. The Block cursor buttons are used to move from one block to the next, and blocks may be added or removed at will up to the maximum the DSP can support. A new Quick Route feature has been added that allows any block

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ALESIS Q20



▶ to receive signal direct from the left and right inputs (separately, from either one or mixed) and to have its outputs sent directly to the left and right outputs. The wheel scrolls between None, Left, Right or Both. Routing levels can be changed to prevent overload caused by EQ boost and so on, and in Quick Route mode, the routes added are set to -6dB until changed by the user.

As well as the basic effects, the Q20 also includes two modulation source generators, each of which can be set to Input Envelope, Peak Follower, Ramp, LFO or Footswitch. Real-time MIDI modulation of up to eight parameters per patch is also possible, though the parameters that can be controlled depend on what effect type is assigned to a block. Again, setting up is simple: select a modulator, choose a target, choose the modulation source and set the amount of modulation.

In Use

I've used a Q2 before, so the Q20 felt quite familiar to me, but even if you're a little nervous of effect programming, there are so many good presets that most of the time you can tweak one of these to give you what you need within a few seconds. There are 100 factory presets plus 200 user memories, which come ready filled with interesting patches for you to use, edit or replace. Most of the factory patches are identical to those in the Q2, though there are a few new ones. The reverbs are exceptionally smooth and luxurious-sounding and the overall range of effects is pretty comprehensive, though occasionally you find them lurking in odd categories. For example, the EQ section also includes a resonator, tremolo effects, a stereo simulator, panning and even overdrive.

There are 14 different reverb types to choose from, including spring, reverse and gated, but the

polyphonic resonator of the Quadverb is still absent. All the modulated delay effects are very classy, with the chorus and flanging rivalling the best on offer, and though I've yet to hear an electronic box that does flanging as well as two analogue tape recorders, this one gets pretty close. It also does a pretty mean noise-free Electric Mistress sound too.

Compared with the Q2, there's not a huge subjective difference in sound, but reverb decays are smoother and you can leave a little more headroom without running into noise problems. However, the improvement in signal-to-noise ratio is less dramatic than the improvement in low-level resolution. Editing is straightforward, but the small display means you have to work pretty close up to see what you're doing, so don't mount this unit right at the bottom of a floor-standing rack!

Summary

The Q20 compares favourably with other effects units in the same price range, but this is a tough market with so many 'good enough'-sounding effects units costing less. In fact, many retailers claim the market for £600 to £1000 effects barely exists in the UK. My own view is that Alesis should have added more DSP power, so that more effects blocks could be combined before the 'game over' message appears. It would also have been nice to have had a MIDI controlled synth-type filter and a ring modulator. As it is, I feel the effects are a little on the safe side for some of today's musicians, albeit extremely good in quality. I also know a lot of original Quadverb owners who are still hanging onto those machines because of two or three favourite patches that they can't quite duplicate on anything else. In theory, the Q20 can emulate just about all the effects blocks and configurations of the Quadverb, and I wouldn't mind betting that if Alesis included a computer disk that would enable patches from the Quadverb to be translated into their nearest Q20 equivalent, they'd sell a whole lot more.

Those criticisms aside, the Q20 is a superb sounding, easy-to-use machine that can be used either as a multi-effects box or as a really first-rate main reverb. The comprehensive digital I/O means it can be slotted into systems using ADATs and digital mixers, and the more professional analogue I/O is to be welcomed along with the internal PSU. If you're in the market for a good effects box that falls midway between all those 'good for the money' boxes and those high-end car-priced pro units, I'd recommend you give the Q20 a try. Its obvious competitor in this price range is the Lexicon MPX1, which I also happen to like very much, but the two units have quite different characters and effect repertoires, so I'd strongly recommend you try to hear them side by side. **SSS**

The Q20 features a much greater range of analogue and digital I/O options than its predecessors. S/PDIF joins the digital ADAT connection of the Q2, and the analogue ins and outs are available on either XLRs or jacks.

Digital I/O

The Q20 can accept or transmit digital data via two channels of an ADAT light-pipe or via S/PDIF, and synchronisation is either via the subcode of the digital connection itself, or the unit can be externally locked from a 48kHz master clock such as that provided on the Alesis BRC. Within the Global setup pages of the Q20, the desired pair of ADAT tracks to be addressed via the ADAT I/O can be selected.

ALESIS Q20 £899

pros

- Well designed operating system.
- Very classy reverbs and effects.
- Flexible effect routing options.
- Comprehensive analogue and digital I/O.
- Internal PSU.

cons

- DSP isn't always adequate to combine as many effect blocks as you'd like.
- The detailed display means you have to be very close to the unit to edit patches.

summary

The Q20 is a very professional-sounding 20-bit effects processor with equally professional I/O facilities. It does few things out of the ordinary, but there's no arguing with the sound quality.

SOUND ON SOUND

Specifications

- Frequency Response: 20Hz to 20kHz +/-0.2dB.
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- Analogue Inputs: Stereo (L/R) Combination XLR/quarter-inch TRS jacks, balanced/unbalanced.
- Analogue Outputs: Stereo (L/R) XLR, Stereo quarter-inch jacks, balanced/unbalanced.
- Digital Conversion: 20-bit 256 times oversampling A-D; 20-bit, 256 times oversampling D-A.
- Digital Input/Output: ADAT Multi-channel Optical Digital Interface, S/PDIF Digital Interface, BNC jack for 48kHz word clock connection.
- Factory Preset Programs (ROM): 100.
- User Programs (RAM): 200.
- Dimensions (WxHxD): 19 x 1.75 x 7 (inches). (483mm x 45mm x 178mm).
- Weight: 4.25 lbs. (1.9kg).

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MMR-8

**PILCHNER-SCHOUSTAL
ACOUSTIC X**

the X factor

During the course of my series on basic acoustic design, which finished last month, I've mentioned

Acoustic X on more than one occasion, not least because it's the only software I've found that provides serious help with studio design for users with a limited knowledge of acoustics. It was developed by Canadian acoustic consultants Pilchner-Schoustal with a view to providing the project studio designer with the basic tools necessary to optimise the main acoustic parameters of a small room.

Designed to run on just about any CD-ROM-equipped PC running Windows 95, the software requires a password from the manufacturers to activate it once it has been installed. The program itself is divided into four main modules, each of which may be used independently, though in most cases, you'd start at the beginning and work through them in sequence. In Module number one, you enter the dimensions of a rectangular room you want evaluated, and the program checks the modal response of the room, plotting out the axial, tangential and oblique modes, and warning of any problematic conditions. If you haven't yet built the room, you can give the program a set of upper and lower size limits for each dimension and it will work out the optimum room dimensions for you.

Module two works out speaker boundary interference so that it can advise on the best position in the room to place your monitors.

Module three uses ray tracing to track reflections from the studio walls so that their arrival time and level at the listening position can be evaluated. Finally, module four is used to determine how much absorbent material is required to achieve the target reverb time. On top of that there's a useful acoustic calculator that can be called up at any time. The best way to get to know this software is to examine one module at a time.

Modal Response

Room modes occur when a sound is present at a frequency such that its wavelength is an exact multiple of one of the room dimensions. As there are many multiples, each mode comprises a whole series of frequencies. How well a room performs for listening is determined by how evenly these modes are distributed, and of course that depends on the room dimensions. In addition to the axial modes that exist between opposite surfaces, *Acoustic X* also calculates tangential modes involving pairs of surfaces in two axes and oblique modes that

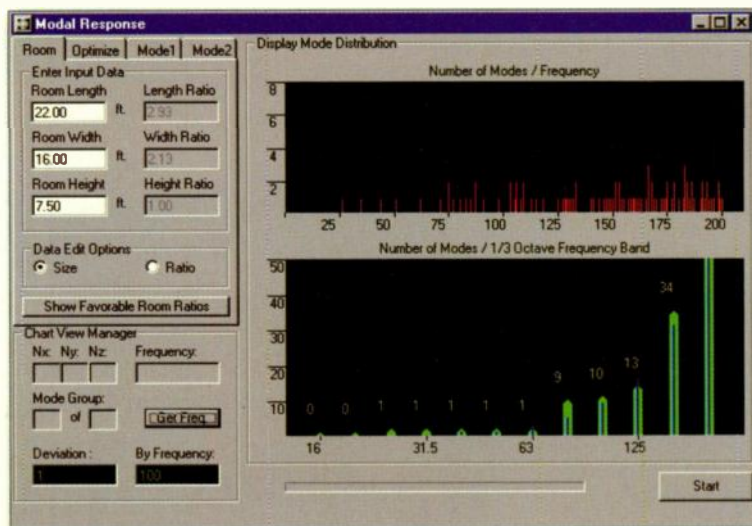
PILCHNER-SCHOUSTAL *ACOUSTIC X* ROOM ACOUSTIC OPTIMISATION SOFTWARE FOR PC

involve all three axes of the room. The software checks to see if the modal distribution increases with every third-octave band, which it should, and also checks to make sure that two or more modes don't exist at the same frequency unless there are at least five modes in that particular third-octave band to help smooth out the effect.

As soon as the room dimensions are entered, *Acoustic X* displays the modal response, which can be viewed as a graph or as a list of modes. If problems are likely to occur, the software issues a warning detailing the frequencies at which modes coincide. Low frequency modal pile-up problems can then be tackled by installing a low-frequency absorber at the problem frequency. The software is also able to construct a three-dimensional pressure graph of the room — absorbers must be placed in regions of high pressure to be effective, generally in the corners. *Acoustic X* also includes a library of 'famous' room ratios that have been shown to produce good listening results, though these won't always work well if the room size is scaled up or down from the original as the modal distribution is affected by room volume. Still, it's easy enough to run the software and recheck the results. Various

Acoustic design is usually a combination of guesswork, intuition and very hard maths. **Paul White** tries delegating it to his PC instead.

Figure 1:
Modal display.



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**PILCHNER-SCHOUSTAL
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► display options are available within this module, and on the whole, it's as simple as entering data and watching the results appear. It certainly beats doing the calculations manually! Figure 1, on page 184, shows one of the display options.

Speaker Boundary Response

This module calculates what happens when low-frequency sound from the monitors reflects from the walls, floor and ceiling near to the monitors and then combines with the direct sound. Because the reflections travel further than the direct sound before reaching the listener, they are slightly delayed, resulting in phase additions and cancellations at specific frequencies. This boundary effect is why monitors sound more bassy when they are mounted close to walls or corners. A small database of speakers is included with the program, and you can add your own by detailing the box size and the height of the drivers above the bottom of the cabinet. The database software also asks for the low-frequency cutoff of your monitors and the low-frequency crossover frequency.

Once you've told the software whereabouts your speakers are positioned, it will create a graph of the low-frequency response, as shown in Figure 2a. *Acoustic X* will also show you where your speakers should be placed for the best results, but if you don't have the flexibility to follow this advice, you can specify a range of limits over which you can move the speakers and the program will give you the best option. Interestingly, the software can also work out the best place for surround speakers. In all cases, an optimum listening area is shown, and the speaker angles in both the vertical and horizontal plane are displayed. A three-dimensional drawing of the room and the speakers within it is created, also showing the ideal positions for wall/ceiling absorbers and corner traps. This view is shown in Figure 2b.

Ray Tracing

Here information about room size, speaker placement and absorber placement (as shown in the room view) is used to work out the possible reflection paths from the monitors back to the listener. Each of these is displayed with its delay time and amplitude; you can also see a three-dimensional room view as the reflections are being traced. How long tracing takes depends on how coarse or fine you set the reflection angle resolution to be, and on how many reflections you want to view. In reality, this particular display soon becomes a mess of coloured lines, but the listed results, as shown in Figure 3 on page 188, are valuable. A Data View mode shows a number of parameters including the room volume, surface area, the average absorption coefficient (Alpha), RT60, the number of reflections used in ray tracing and the total number of traces calculated. In practice, what you need to confirm is that no early reflections are louder than around 10dB below the direct sound. As with the other modules, a number of presentation views are available.

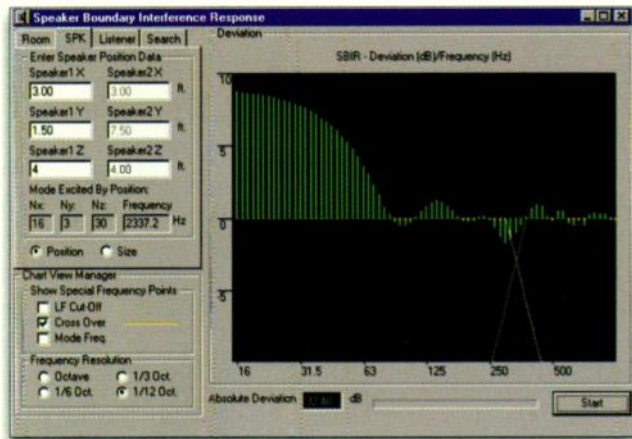


Figure 2a: Speaker boundary response.

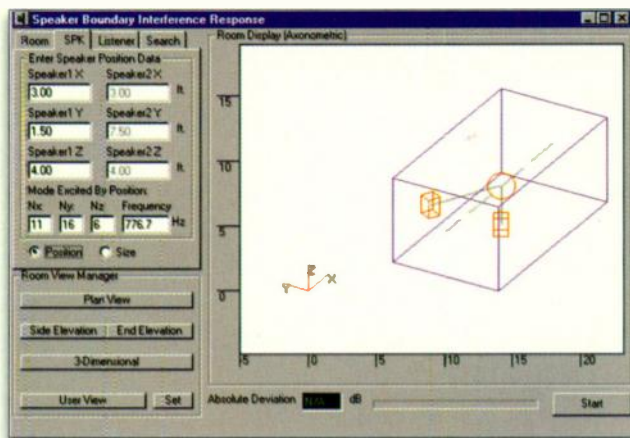


Figure 2b: Room view display.

Reverb Time

The reverb time module aims to help you determine what types of absorbent treatment are needed, and how much. You can simulate the application of varying areas of different materials from a database to the six room surfaces, and each time you make a change, the reverb time is recalculated for eight frequencies in one-octave bands running from 63Hz to 8kHz and displayed on a graph. Whenever a material is selected, a chart is created showing the absorption coefficients for that material over the same eight frequencies. If the material you want to use isn't in the database, you can add it to the database providing you have its absorption coefficients.

When starting this module, you can pick from six different room types ranging from a Dolby surround cinema to a user-defined room; average data for a control room, studio area and isolation booth are included. Once one of these is chosen, it shows up as a reference line on the reverb time graph alongside the calculated line for your room. You can also opt to calculate the reverb time using formulae from Sabine, Eyring, Fitzroy (based on Sabine), Fitzroy (based on Eyring) or feed in the actual measured reverb time of the empty room. While Sabine's formula is the simplest, Eyring is better for rooms that contain a lot of absorptive materials, and the Fitzroy methods are best where the absorptive materials are not evenly distributed. That means that it's probably best to use one of the Fitzroy methods to evaluate a typical control room, which is why it's important that the program knows on which surfaces you've placed your

**PILCHNER-SCHOUSTAL
ACOUSTIC X**

pros

- Fairly easy to use with good support from the manual.
- Takes all the hard work out of mode, reverb and reflection calculations.
- Includes a good database of typical studio materials.

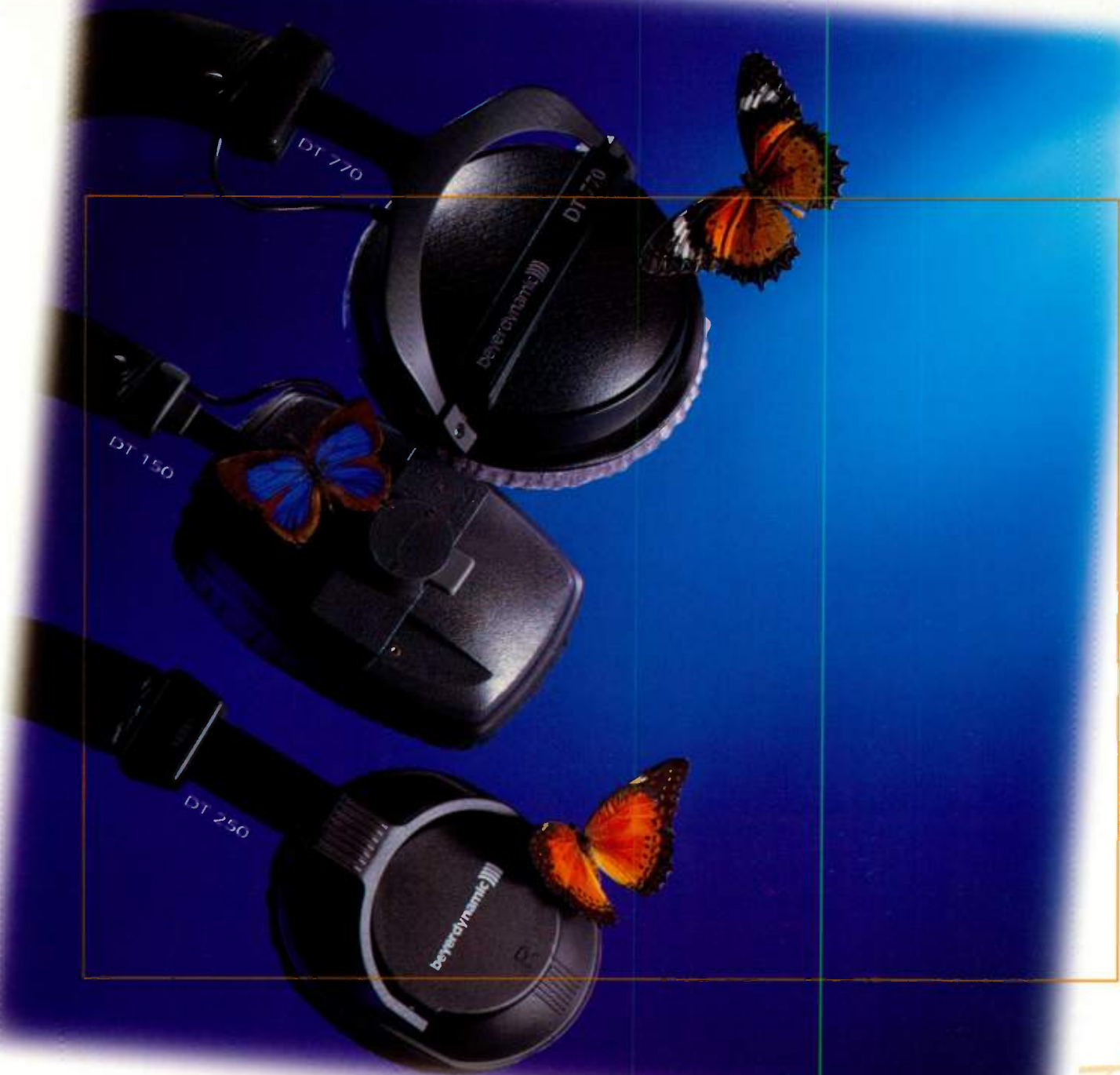
cons

- Results are only as good as the figures you feed in — and then only for an empty room.
- A little expensive for the home studio owner who's only likely to use the software a few times.
- User interface could be slicker, but then this is only the first version.

summary

Acoustic X is a genuinely useful and very quick way to do the basic calculations associated with studio acoustics. However, it can never be entirely accurate because of variations in the properties of real-life materials and the fact that it can't allow for equipment and furniture in the studio.

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**PILCHNER-SCHOUSTAL
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► various absorbers. There is also an optimisation routine that lets the program change the areas of certain absorbers within limits set by the user to get the closest fit to the optimum reverb characteristics. Unfortunately, however, this deals only with total areas of absorption and not placement, so if you run this, the Fitzroy options are removed from the menu.

The final accessory is an acoustic calculator that can be brought up at any time by clicking the calculator button on the tool bar. Here you can change from metric to imperial units, work out inverse square law calculations, add levels, convert frequency to wavelength and vice versa, calculate comb filter frequencies from a delay time, and of course you can add up!

In Use

Acoustic X doesn't have the neatest interface in the world, but it's fairly easy to get to know, and other than the ray tracing option, most calculations are virtually instantaneous. Calculating even the basic axial room modes manually can be very tedious, but *Acoustic X* shows you all three room mode types and their frequencies as soon as you enter your room size. Similarly, the reverb time calculations are fast and easy, with a useful number of real-world surfaces included in the database. There's even a figure for freshly fallen snow, but I don't know of anyone who's used that as the basis for studio design!

The speaker boundary module is a genuine help in figuring out the best place to put your speakers, and also helps you place absorbers to cut down on reflections, while the ray tracing section shows the severity and timing of early reflections. The handbook takes you through each stage quite logically and in plenty of detail, and it even allows you to print reports if you're doing acoustic design work commercially, though it falls a little short when it comes to telling you exactly to what extent you can rely on the calculated data. The limitation with any such program is that the results for RT60 are only as good as the figures you feed in, and even then, the result is for an empty treated room. Once you add a mixing console (which changes the early reflections considerably), a few racks of gear and some shelving, things are bound to change to some extent.

If this program goes on to be revised, I'd like to see a more graphical approach that allow areas of absorbent material to be dragged onto a representation of the room and then be resized using the mouse, just as you might in a drawing program. The software could then calculate the changes in real time as you made them. Also, for project studio owners, it might be useful to have a more streamlined approach to room optimisation where you, for example, provide the information on room size, surface types, monitor details and what types (and maximum sizes) of acoustic absorbers you have available (curtains, foam tiles, acoustic blankets and so on). The software could

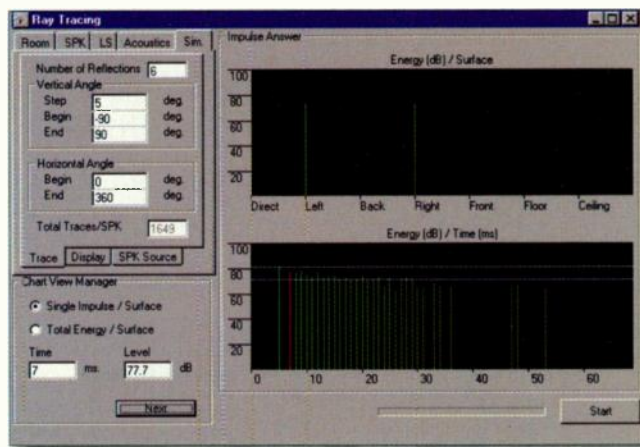


Figure 3:
Results of
ray tracing.

then run through the whole optimisation program automatically, presenting the user with a best option for speaker and absorber placement as well as a report on how well, or otherwise, the optimised studio will perform. As it stands, you have to go through each module individually and make decisions that some people might feel unqualified to make. Each of the modules has several more options and facets than I've had room to describe here, but I hope you have a general idea of what the program can do.

Summary

Acoustic X is ideally suited to the project studio owner with a little background knowledge who wants to have a go at improving their listening environment. This includes just about any SOS reader who has followed our series on basic acoustics and would like to try to put a few of the concepts into practice. However, even taking into account the comprehensive handbook, *Acoustic X* could be a little overwhelming for complete novices. Such users may well be more interested in the forthcoming 'Lite' version, which has a simplified user interface, omits the ray-tracing module and is expected to cost about half as much as the full version.

The professional studio designer, by contrast, will probably come up against *Acoustic X*'s limitations fairly quickly, or at least have to use it in conjunction with specialised measuring equipment. As pointed out earlier, perhaps the main limitation is that you can't always be certain of the precise acoustic properties of the materials from which your room is built, and there's no way to model the effects of a mixing console or racks of gear other than inputting figures (if you can get any figures) as areas of wall or floor. These limitations aside, *Acoustic X* is very useful tool that takes all the donkey work out of calculating room modes and reverberation time, and it's so fast that it allows you to explore any number of 'what if' scenarios. To my knowledge, there's no equivalent product on the market, though there's definitely a need for acoustic design software pitched at this level. Despite a few rough edges, *Acoustic X* is both practical and educational, and though it's not the last word in studio design, it beats the hell out of sitting at a desk with a notebook and a calculator! **SOS**

information

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guitarras atomicas - sagat

guirey The guitar is distorted, but not overly. Yes, there are rockist overtones, but they are never cliché-ridden. Technique, tone and timing are exemplary throughout, as is the engineering. It's amazing how a few well-placed licks and rhythms can immediately bring a promising but perhaps too-sterile keyboard composition to life.

on the beaten track

Steve White is the master of Jazz, Acid Jazz and R&B. He's used all his skill on this CD to create vintage breakbeat grit and hard-assed techno mayhem. Those whose tastes run toward sonic rough trade will find it difficult to top these aggressive sounds. Rough and dirty all the way, down to the sloppy-in-a-hip-way pedal noise and gasping tube-style compression.

underfire vol 1 - terminalheads

This unique collection of distorted, filtered and phat samples ranging from drum loops, funky cruch gate corner, dub fx, Pascal Banadjaoud percussion to shortwave strangeness and trippy oddness. Experimental future punk is probably the most accurate description. There are no rules. There are no bpm's. There are no keys.

underfire vol 2 terminalheads

Mighty, meaty, compressed live beats on the edge of distortion make up the first 10 tracks. It's a producer's dream, with filtered loops, hip-hop friendly crustiness and tightly ED'd scat loops sharing groove space with all manner of effected extremities.

abracatabla - tavin singh

Tavin Singh's superb performance on this CD has amazed just about everyone who's heard it. It features both grooves and single hits from Tablas, Duggis, Lowha Tarang, Kachi Dhol, Cowbell, Jamblocks, Gong, Tam Tam, Gongru, Tambourine, Shekere and loads more.

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drumtools

The only loop CD dedicated to rock and pop drum loops. Probably everything is played live with tempo sets, inspiration grooves and individual hits so you can make drum tracks with a flow and natural feel. 4/4 straight, 4/4 shuffled, 6/8, blues, brushes and the big section of inspiration grooves.

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This construction kit contain electronic sounds for Trance, Ambient, Electronic and New Age. The audio files are recorded from pro synths and effect processors, all arranged in tempo groups 110, 120, 130 and 140. Loads of pads, filter sweeps, arpeggios, atmos and electronic fx's.

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World Radio History

DIGITECH 2120 ARTIST

The 2120 Artist is the latest rack-based guitar preamp system from Digitech. It has much in common with the Johnson Millennium One Fifty combo reviewed by Dave Lockwood recently (*SOS* August 1998) and is a direct replacement for Digitech's earlier 2112 rack preamp/multi-effects unit. Apart from a very obvious change in the colour of the front panel (you are not going to lose this unit in your rack!), there are a number of differences between the older 2112 and the new 2120 Artist. A significant software revision has improved the processing potential (for example, longer delays are available), a revised range of both valve and solid-state distortion types are provided, and a selection of the 100 factory presets are designed by a fairly impressive list of distinguished guitarists including Joe Satriani and Frank Gambale. A further addition is the inclusion of Digitech's Control One footswitch board, which has considerable potential for the studio user as well as its obvious live applications.

Vital Statistics

The 2120 is housed in a solidly built 2U rackmount case. Inside, a combination of two 12AX7 tubes and two SDISC II processors (as used in other Digitech studio processors) combine to give the best of both valve and solid-state technology. The manual claims a frequency response of 20Hz to

purple reign?

DIGITECH 2120 ARTIST GUITAR PREAMP/EFFECTS PROCESSOR

It's small, beautifully formed, shows a fondness for purple and claims to be an 'Artist'. **John Walden** finds out whether Digitech's new guitar preamp/effects processor sounds fit for a Prince.



DIGITECH 2120 ARTIST £999

pros

- Professional, convincing and versatile amp sounds without the volume.
- Excellent range of digital effects.
- Effective noise reduction.

cons

- Wah effect will not cut it for some.
- Some presets might not be to everyone's taste.
- No input on rear panel.

summary

If you want access to a variety of very professional guitar sounds with some great digital effects and are prepared to spend some time experimenting, the odds are that you will be able to get what you want with the 2120.

SOUND ON SOUND

20kHz, and a signal-to-noise ratio of greater than 91dB, with internal digital data handling operating at 24-bit resolution. Memory capacity allows 100 factory and 100 user programs.

On the left-hand side, there is a small grille which provides air circulation to cool the tubes, an input jack for your guitar lead, a small input clip LED and knobs to set both input and output levels. The centre is dominated by the large, clear display, underneath which are five very guitar-oriented knobs that change Gain (level of distortion), Bass, Mid, Treble and Mix (balance between wet and dry signals). These controls allow instant basic editing of a sound when more detailed work is not required, but change other parameters when delving further into the editing process. The large Program knob moves between programs (surprise!) and also doubles up for other editing duties. On the right-hand side are the power switch, eight backlit buttons and a row of seven smaller black buttons. While all of this might send more 'traditional' guitarists scampering back to their amplifiers, the large number of individual controls means that each button has a single function, and editing is therefore less complex than might otherwise have been the case.

The rear panel includes a pair of quarter-inch TRS balanced jacks for left/mono and right output (nominal level -10dBV, +4dBu switchable). A similar pair act as send and return for an external effects loop, with a switch to adjust the level at which the loop operates; a further input jack allows use of a passive volume pedal. A 5-pin DIN socket connects to the Control One foot controller, and things are topped off with MIDI In and Out/Thru and a socket for the power cable to the internal power supply. The input socket is not replicated on the back panel, which might be a minor irritation if the unit is permanently installed in your studio rack and you like to keep all your cable work tidy via a central patchbay.

The Control One foot controller measures approximately 65 by 15cm. The 12 switches allow patch selection, and can also be configured to switch individual effects in and out, while a 20-character fluorescent display shows the current patch number and name. Probably of more interest in a recording context is the expression pedal, which can be programmed to provide real-time control of any parameters within a particular

patch. While obvious applications are volume and analogue wah, its uses are much broader than this.

Sound Construction

As with most guitar preamp/multi-effects units, in the 2120 the input signal is first fed to the preamp and then passed to the digital effects section. The range of editing options available at both these stages can only be described as comprehensive. This said, Digitech have made considerable efforts to provide an editing process that operates at a number of different levels. Those who are used to have nothing more than a cable between their guitar and amp will like the five knobs underneath the display that provide instant access to tweak the gain (distortion) and EQ of a patch. Beyond this, things can get as detailed as you might wish, but anyone who has spent time with even a basic multi-effects unit should find the editing process here fairly easy to get to grips with. If in doubt, the manual does a pretty good job of explaining the steps involved.

The basic construction of a sound is illustrated on page 194. The preamp stage consists of compressor-wah-tube/distortion-EQ-gate chain. As indicated in the diagram, both tube and solid-state distortion modules are available and can be run either individually or in parallel. In addition, the relative levels of the two distortion modes can be set, as can their EQ. If one of the 'dual-output configurations' (see below) is selected for the digital effects section, the positions of the two distortion types within the stereo field can also be adjusted (so, for instance, you could have the tube distortion panned extreme right with the solid-state panned extreme left). Any of the blocks within the preamp section can be bypassed if required; bypassed blocks are indicated on the display by a line underneath the name of the particular block.

Editing the preamp demonstrates how sound construction operates at a number of levels. At its most basic, a complete set of preamp settings can be selected with a single push of a button, whereupon you can dial through a series of 30 factory presets. These cover a range of basic tones, and the names give a clear idea of the intended sound (see the box on the left). At a more detailed level, each block within the preamp can be changed individually if required. For example, the tube distortion block has 14 presets of its own, each providing a different type of sound (from Warm Clean 1 through to Sat Tube 3). Finally, if you want absolute control over your sound, individual parameters within a block can be edited (eg. the threshold, ratio, attack and output level of the compressor block). At each of these 'levels' of editing, a number of user presets can be stored, so favourite settings can be recalled for use in other patches.

As might be expected given the two SDISC II processors, the range and quality of digital effects is impressive (see the 'Digital Delights' box). A set of 24 possible configurations allow the total processing power to be allocated in various ways. Each

Preamp Presets

The 30 factory presets for the preamp section provide easy access to a wide range of basic amp simulations.

The titles give a clear indication of the style intended.

- Bluesy Rhythm
- Blues Lead
- Rock Man
- Twin Combo

- 1x12 Combo
- Country 1
- Country 2
- British Stack
- American Stack
- Dirty 1x12
- Fusion Lean
- Violin Lead
- Fuzzy Face
- Daddy's Tone
- Double Overdrive
- High Gain Solo

- Sweet Clean Tube
- Big Honk
- Power 1
- Power 2
- Blues Drive
- Power Clean
- Thick Blue
- Solo 1
- Solo 2
- Bright Comp Tube
- Klean Krunch
- T:Dirty-D:Clean
- T:Clean-D:Dirty
- Tube-DistHybrid

DIGITECH 2120 ARTIST

► configuration offers a different arrangement of blocks in the multi-effects chain and allocates either a quarter, a half, three quarters or the whole of one of the SDISC II processors to a block. This means that a maximum of eight effects (each using a quarter block) can be used in a single patch. Blocks allocated more than a quarter of a processor's attention provide greater control over the nature of the effect (allocating more power to a delay, for instance, increases the maximum delay time available). A number of the 24 effects configurations are 'dual block configurations', which allow different effects to be used on the left and right channels — the block diagram shows such an example. If all this has you reaching for a stiff drink, don't worry. As with the preamp section, each digital effect type offers a number of very usable presets to select from and their names, which are shown on the display as you step through them, provide a good guide as to what to expect (anyone for an OakFloorRm reverb?).

To round off, amongst a range of other features such as a tuner, it is worth noting that the speaker emulation and EQ/effects mix can be adjusted globally for all patches. Both of these features would be useful if moving from live use to DI recording in the studio, as would the noise reduction, which can be placed at a number of points in the signal path.

How Does It Sound?

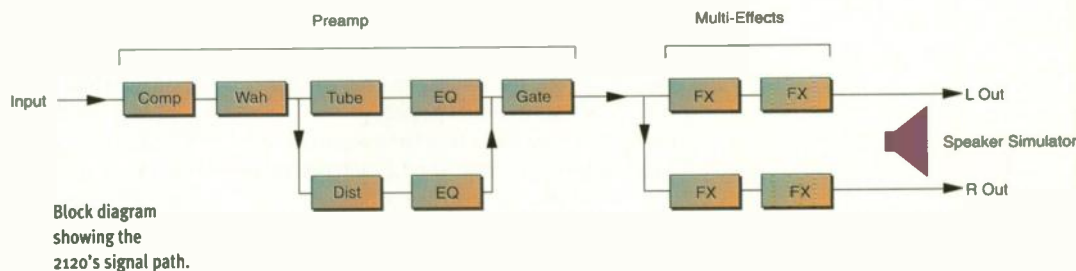
So just how does the combination of all these tubes and chips translate into a guitar sound? As all guitarists know, one person's 'right sound' is another's 'right racket', but to my ears at least, the 2120 delivers some superb tones. Presets 56-60 are based on the preamp section, without all the sparkle added by the digital effects, and give a good idea of some (but by no means all) of the basic tones available. All are very convincing and very usable. Tweaking the Gain and EQ controls beneath the display produce a dramatic effect on each of these basic sounds, exactly as it would with an amp.

Do the tube-based patches allow you to get those warm, cranked-up valve amp sounds? Although you don't get to feel your chest vibrate in quite the same way, the sound is very authentic. A little adjustment to the EQ of patch 45 (Sweet and Blue Solo) left me feeling that I really was playing a Les Paul through a Marshall in a Large Hall, and for something a little heavier, patches 10 (REEVZ' Largest Tone) and 54 (Bad Attitude) delivered some good 'metal' tones. If you need to clean up your act patches 21 (Head Dog Sample) and 78 (Crisp Clean) are good starting points, and with a little use of the EQ could move from warm and round through to something with a real bite.

In addition to these impressive, but more conventional sounds, the 2120 is also very capable of producing something a little more off-the-wall. Patch 29 (Promethius) has a subtle, but very effective use of pitch shift, and if you want a moody Portishead-esque sound, try patch 47 (Gonna Be A Showdown). Patch 99 makes use of the Control One expression pedal to provide an excellent texture that lives up to its name Guitar Synth Pad. In addition to this sort of expressive use, some patches use the pedal to 'morph' between two different tones (such as patch 36, 'Country >> Rock Morph') that can provide some really dramatic real-time changes in sound.

One aspect of the foot controller did disappoint me slightly — I found the analogue wah less convincing than a standard wah footpedal. As this function is only used in a very small number of the factory presets, one wonders whether Digitech's programmers might feel the same; it's a criticism I've seen levelled at other guitar multi-effects units. Don't throw out the Cry Baby just yet.

With all the editing possibilities described above, the combination of dual distortion modes and some hefty processing power, the range of sounds on offer is only limited by your willingness to edit. As with many guitar preamp/effects units, individuals might feel that the presets need a little work to get the best out of them. With the 2120, however, that work is going to be very well rewarded. Clean and simple, loud and nasty or just downright weird, the sounds from this unit, whether through an amp or DI'd, are wholly professional.



Conclusions

This unit is probably not going to appeal to the guitarist who just needs one or two basic sounds, so if you know your amp and how to mike it up to get those, stick with it. If, on the other hand, your studio needs a really wide variety of guitar sounds then the 2120 is an excellent 'one-stop shop'. While you could get many of the sounds available here by chaining a separate preamp and effects box together, the integrated solution presented here, where all the components are designed to work together, produces a sum that is greater than the parts. In my own view, this is one of the most impressive preamp/processor units I have ever tried. **SCS**

Digital Delights

The digital effects available are:

- Reverb.
- Chorus.
- Flanger.
- Phaser.
- Rotary Speaker Simulator.
- Tremolo.
- Auto Panner.
- Pitch Shifter.
- Detuner.
- Delay (with a Tap function available via the Tapit button on the front panel).
- Equaliser (both graphic and parametric).
- Multi-effects modules (combined effects that use less of the available processing power).
- Whammy Effects.
- Auto Wah.

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.....some things never change.

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EGOE



KORG N1R

synth

N1Rvana?

KORG N1R SYNTH MODULE

Korg's N1R presents their AI² synthesis technology in rackable form with 64-note polyphony, 32-part multitimbrality and a massive onboard library of well over 1000 different sounds and combinations. Layers and splits can be set up for control over a single MIDI channel and, as you'd expect from a serious modern synth, there are two independent effects

The latest product of Korg's long-established AI² synthesis technology, the N1R module may not break any ground, but it bristles with great sounds and is a cinch to edit.

Paul White feels thoroughly Nlightened...



processors on board. These are capable of producing a wide range of both conventional and less conventional effects, including resonant filtering. Though there's full GM, GS and XG support for the creation and playback of Standard MIDI Files, the N1R is actually a very flexible synthesizer — it might not do anything radically new, but the sheer number of sounds combined with good audio quality and a well-conceived user interface makes it a very serious instrument.

To take the pain out of sound editing, four real-time control knobs are included in addition to the main data entry wheel, while an internal

arpeggiator offers 20 different arpeggio types, all of which can be sync'd to MIDI clock if necessary. To simplify connection to a computer, a 'to host' socket is provided that is compatible with both Macs and PCs via optional adaptor cables. And for those more intimate moments, there's a headphone jack.

Although everything is crammed into a 1U box, the N1R has a comfortably uncluttered feel, complemented by a clear display based around intuitive icons. There are four audio output jacks on the rear panel, plus just a single set of MIDI In, Out and Thru sockets — which begs the question 'How does the 32-part multitimbrality work?'

KORG N1R £549

pros

- Inexpensive.
- A huge range of usable sounds and drumkits.
- Extremely easy to use.
- Built-in arpeggiator.

cons

- No resonant filters within voice architecture.
- External PSU.

summary

Though the AI² synthesis method is now far from new, the N1R is a good-sounding, easy-to-use synth at the affordable end of the price range.

SOUND ON SOUND

You need to use the direct computer connection if you want to send more than 16 MIDI channels at a time, but I'd have thought a second MIDI In socket would have been more use to more people. This may not be too drastic a problem — few people are likely want more than 16 parts out of the N1R, especially since the polyphony will probably run out before the number of parts does. The N1R's two sets of MIDI channels are designated A and B, and both Mac and PC drivers for the computer connection are included on a floppy disk; Mac users may also use MIDI Manager or OMS if preferred. Power comes from an external PSU, but at least this connects via a substantial 4-pin DIN.

The front panel reveals the N1R to be non-expandable. There are no card slots, and no provision for adding internal waveform cards or chips as you can with the Roland JV2080 or the forthcoming Emu Proteus 2000. What's more, though there are low-pass filters within the voice architecture, these lack resonance and thus self-oscillation — a curious omission, given the proclivity of modern composers to use thwips, blips and sweeps with seeming abandon. There is a

directly accessed via these controls, all of which are printed on the panel above the knobs, and the most useful mode provides instant access to Attack, Release, Cutoff (frequency) and Effect (amount). I've often thought that a synth with hundreds of sounds that could easily be tweaked would be very welcome in those studios where the business of making music takes precedence over fiddly patch editing — and here it is. The other two sets of functions relate to the main arpeggiator parameters and to Balance, Pan, Modulation and Portamento.

When you want to edit sound Programs in more depth, you're greeted with an icon-based block diagram similar to that of a basic analogue synth. Each block may be selected in turn using the cursor buttons, while pressing Edit brings up the editable parameters relevant to that block. The Oscillator, Filter and VDA (level envelope) blocks each have one envelope and one modulation input, again depicted by small icons. Selecting any of these allows the relevant parameters to be edited very simply, and although I generally dislike editing synths, I sailed through most of this one without ever opening the manual — the user

“To take the pain out of sound editing, four real-time control knobs are included in addition to the main data entry wheel.”

interface is supremely friendly and one of the best I've yet come across. The demo songs are also worth a listen — not only do they really put the instrument through its paces, but you also get a scrolling list of the machine's key features along with the display changing from orange to green in time with the music! Exit, and an aspirin, gets you back to normality.

Topology Of A Tone

As with most such modules, operation is divided into a single-Performance Play mode and Multi mode, the latter for use with sequencers and the former for live keyboard control. Once a Program has been called up in Performance mode, four icons on screen show you which parameters the real-time knobs will adjust if turned, as well as the patch name and number, the part number, the sound bank and the performance number. There's also an upper/lower designation to show which half of a split or layer you're dealing with.

Performance mode specifies the setup of parts 1 to 16 including the patches used, splits/layers, portamento and the real-time knob setup as well as effect and arpeggiator settings. The arpeggiator



'colour' parameter which peaks up the filter slightly near the cutoff point, but it's really quite subtle.

Navigating through the various edit and setup pages is done by means of 14 small buttons, all of which have dedicated functions, or at worst, pairs of functions depending on what mode you're in. Data values are changed using either the data wheel or cursor buttons, and the two-colour, backlit display employs lots of friendly graphic icons to help you along the way. But for me, the best part of this synth is the section controlled by the four knobs at the right hand side of the front panel. A Select button steps through three sets of functions that can be

KORG N1R

▶ button brings up a simple edit menu that allows the arpeggiator type to be chosen from a list of 20, with a choice of a one or two octave range and a fully variable speed that may also be locked to MIDI clock. At a slightly deeper level, the arpeggiator step base, gate time, velocity gate and swing parameters may be changed. Up to 32 user Performances may be stored.

The most basic playable sound element is the Program, which may be based either on a multisample or a drum sound. These basic ROM sounds and waveforms provide a source that is then further modified via the conventional subtractive synthesis elements of filtering and amplitude envelope shaping. Modulation comes from envelope generators, LFOs and real-time MIDI control, and two oscillators may be used together to create a more complex sound, though a two-oscillator Program uses up two voices of polyphony. The VDF variable digital filter can be modulated via LFO, but its lack of resonance means that fierce 'zweeeee' filter sweeps are right out. However, it can be used to create more natural dynamics or to take the edge off a sound.

The N1R comes with 1269 Program sounds, and there's a drumkit editing mode that allows the user to create new drumkits or modify existing ones. There are 37 preset drumkits ranging from rock to ethnic, with memory space to store a further two user kits. When in Multi Mode, any of the 1269 Program sounds can be assigned to any of the 32 parts, and Combinations (combinations are usable in both Performance and Multi modes) based on up to eight layered Programs may also be included. Up to 402 Combinations can be accessed, and 100 of these are user-editable. Of course Combination sounds eat up polyphony, so 64 voices can soon start to look restrictive, especially if your basic sounds use two oscillators. However, most of the sounds are rich enough without relying on Combinations to fatten them up. If the polyphony is exceeded, the oldest voice sounding is the one that is turned off.

Each part in a performance may be routed through the two internal effects units in a number of series and parallel configurations, with routing either just to the main output or to all four outputs; as with so many synth modules, the effects routing is potentially the most confusing part of the whole thing. As with most other competing units, the same two effects are available to all sections of a Combi or a Performance, though the effect level may be adjusted on a part-by-part basis. The effects themselves cover the usual reverb, delay and modulation treatments, but there are some nice refinements of these along with distortion, enhancers, parametric EQ and a resonance filter. This latter effect may be controlled via an internal envelope generator and offers three different triggering modes, but because there is only one filter, it isn't the same as having a synth with a resonant filter on each voice. In fact it's closer to the effect of putting the output of an instrument through an external filter box, and it can't be used at all in Multi mode.

Performance

It never ceases to amaze me how many chunks of sound synth designers can cram onto a few megabytes of ROM, especially when you consider how many drum sounds there are in a module like this. In fact there's a fairly generous 18Mb of sound ROM in this machine, but even considering space-saving techniques such as data compression and clever looping (some of the trickier loops are credited to Jupiter Systems' *Infinity* software), I still can't see where they put it all.

Cruising through the presets and tweaking up a few custom sounds of my own showed the N1R to be tonally very versatile, and the sounds it creates tend to sit comfortably in a mix. The sound quality also manages to be both warm and clean, and for all the variety, I was still reminded very much of the M1, not least because a few M1 favourites are in there, including 'Lore'. Granted, you get more of everything than you got in an M1 and the sounds are cleaner, but somehow I felt that after all these years there could be something more. After all, Korg have their own version of physical modelling, their Wavestation is still breathtaking even after all this time, but there's little sign of anything new here. That said, there's a lot to be positive about too. Most of the sounds are musically useful, and if you like warm pads or strings, there are lots to choose from. This is a box that really could provide all the parts of a backing track without seeming obviously weak in any area. Like the M1, the sounds have a warmth and classiness that many other modern synths still fail to capture, and it's worth noting that most of the patches work well with just basic reverb rather than requiring complex effects to hold your interest. This is obviously good news if you're working multitimbrally, as the effects settings are always a compromise in that mode.

Summary

Judged purely on originality of sound, the N1R doesn't appear to offer anything special, but as a general purpose, cost-effective, wide-spectrum workhorse it's actually extremely good. There are tons of ready-made sounds, good-sounding drum kits covering various styles, and a quick-access editing system that's second to none. In fact it's so easy to come up with new sounds that the 100 user Program memories and 100 user Combi memories might soon seem inadequate. The onboard arpeggiator is lots of fun as well as being easy to access, the operating system is friendly, and the asking price is little more than you'd spend for a decent GM module or a couple of voice expansion cards, yet you get GM/GS/XG support on top of all the more adventurous sounds. What's more, Korg's sound designers have done an excellent job in filling the sound ROM with genuinely useful musical sounds. If you're a technology fan, you may find the N1R a little tame, but if you simply want good sounds, easy editing and good tonal variety combined with a solid GM sound set at an affordable price, you really don't need to look much further. **ES**

Floppy Disk

The included PC-format floppy disk contains a number of programs and utilities for both Mac and PC, most importantly the Korg MIDI drivers and a patch editor package.

There's also a file converter that changes Standard MIDI Files between type 0 and type 1 or vice versa. The PC driver is always required when using the host connection to a PC but Mac users have a choice of using the supplied Korg PCIF OMS driver in conjunction with OMS and an OMS compatible application, or the Korg MIDI driver in conjunction with Apple MIDI Manager. The included editing software, however, is not OMS-compatible, and works only with the Korg driver. The manual suggests that OMS is required to get all 32 channels running, but Korg UK have confirmed that this is a mistake; 32-channel MIDI operation is also possible via the Korg MIDI driver.

The editing software can be used to make changes to Performances, Global Settings, User Programs, User Combis and User Effects. Though less sophisticated than some commercial editors, all the basics are there, including envelopes with grab handles that can be manipulated using the mouse.

Information

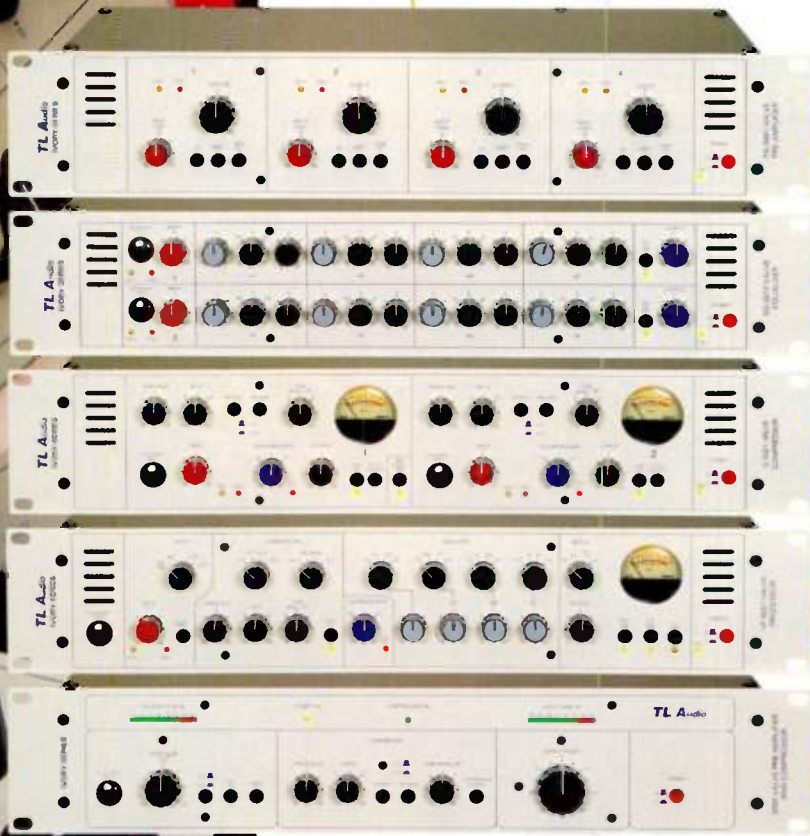
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Superficially, John O'Connor's life is the stuff of many musicians' dreams. Settled near the idyllic Californian town of Santa Barbara, he makes a comfortable living as a TV composer and recording artist, and is happy to acknowledge that he is in an enviable position:

lunar

"I can't believe it. Here I am at 49, and I am more excited about playing the guitar and writing music than I have ever felt before. Every morning when I get up, I can't wait to start playing again; I come in the studio here, switch the DAT recorder on and play for five to six hours, and slowly edit together the acoustic guitar album that I really want to make. If the other music that I record here is instantly forgotten, that's OK, because it allows me to have a studio like this, and do what I really love to do, which is play the acoustic guitar."

These last few lines indicate that there's more to this story than the usual fairy tale of Briton-made-good-in-America. John O'Connor, from London, of Irish descent, indeed landed on his feet after he moved to America in 1987, and is now living a comfortable life, enjoying an income from the four CDs he has made for the American new age company Higher Octave, and also from being one of the musicians who write the music for the cutting-edge cartoon comedy series *King Of The Hill*. In many ways, O'Connor is living the dream of scores of *SOS* readers. However, his story also makes clear that making a living from music can come at a price. In his case musical compromises, loss of musical control, hard work, risks and insecurity are all part of the equation.

John O'Connor started out as a guitarist, but quickly became interested in recording. "I bought a Teac 3340 4-track reel-to-reel, in 1972, and it was the biggest thrill of my life. I enjoyed performing as a musician, but I was not a great performer, so I knew that if I wanted to make a living in music, I had a better chance if I was involved in recording. First I got the 4-track, and then an 8-track. I did demos for songwriters and started my own studio in Walthamstow, North London, called Bark Studios, which is still running today. That went to 16-track and then 24-track, and all sorts of music came through the door, from folk to pop to R&B to Indian classical. But I lost interest when punk came along and people started spitting on the control room window; I went back to the acoustic guitar. Also, I realised that after working for 14 hours in the studio each day, I didn't want to stay and record my own music. So after running a professional recording facility for 10 years, I decided to

John O'Connor said farewell to the UK music business with the million-selling single 'Star Trekkin'. **Paul Tingen** tracks him down at his new home in America, where he is one of the principal composers for the cartoon series *King Of The Hill*, as well as a successful recording artist in his own right.

toons

JOHN O'CONNOR: FROM 'STAR TREKKIN' TO KING OF THE HILL

concentrate on writing and playing music."

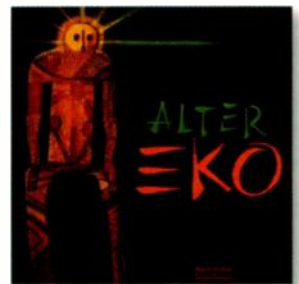
O'Connor did exactly this in the early '80s, when he was a session musician and played guitar with pop and folk-rock bands like Maddy Prior and Rick Kemp, Isla St. Clair and Bucks Fizz. His leanings towards commercial pop music surfaced in some of this session work, and were brought to fruition in spectacular fashion with the next two major events in his life, which turned out to be turning points.

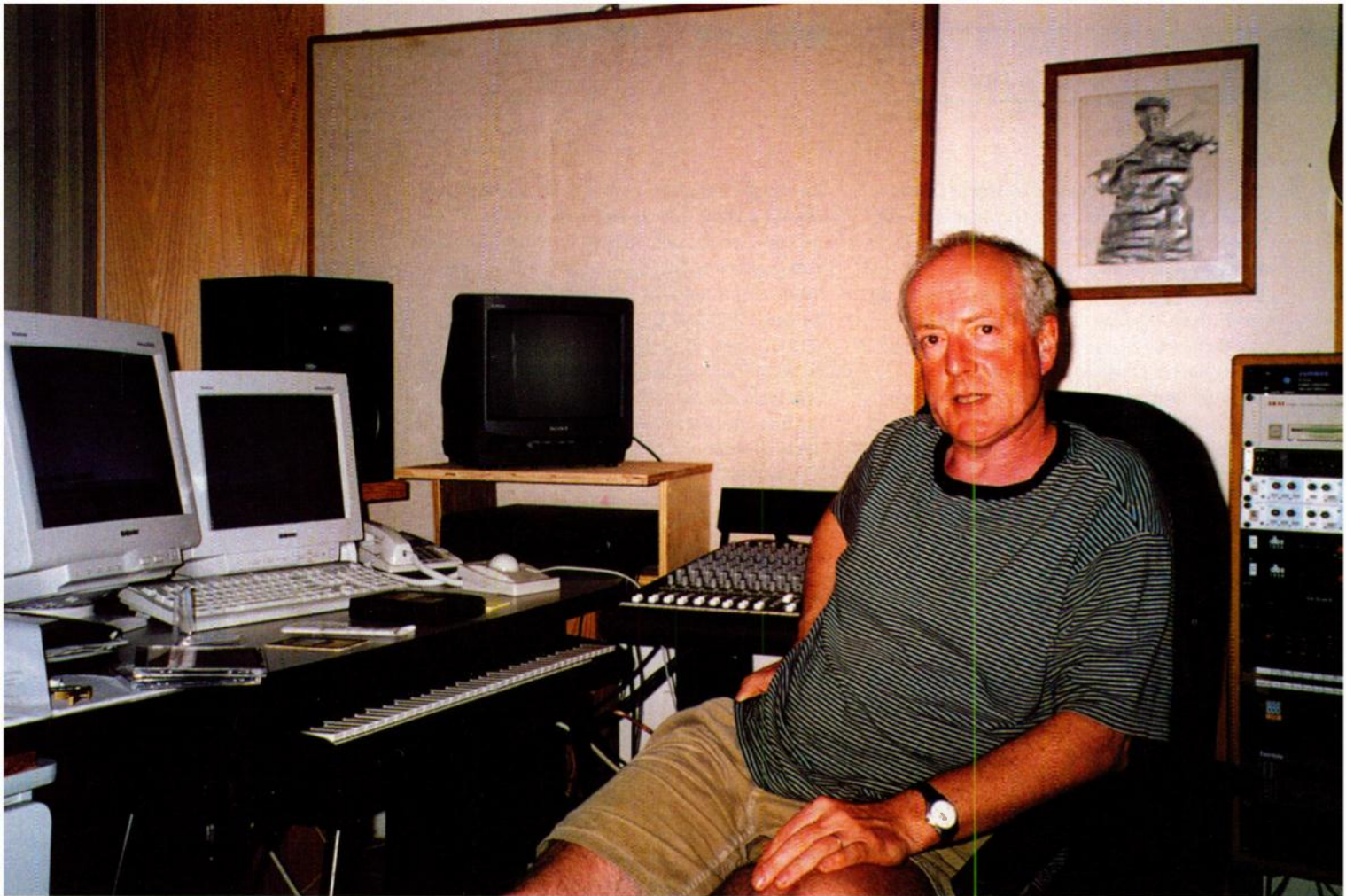
You Must Be Joking!

O'Connor: "First, I wrote a song based on the *Minder* TV character Arthur Daley. Nobody would release it, so I put it out myself under the name The Firm, and it got to number 8 in the UK charts, as a novelty hit. A few years later Graham Lister and I wrote another similar tune, called 'Star Trekkin'. The 20 or 30 record companies that we offered it to all laughed at us and said: 'you must be joking, we're not going to release this as a single!' But I believed in it so much that I had to get it out there. So I started this little record company, released 500 copies, and it slowly picked up. Then, suddenly, it went haywire, and in 1987 it became a number 1 hit in the UK, Europe, Australia and Japan."

'Star Trekkin' sold over 1 million copies and made O'Connor a veritable ton of money. But just as the single was taking off he moved to California, a place he had fallen in love with on a working visit in 1970. Initially, life in California was a bit hectic, because 'Star Trekkin' was in the charts all around the world; for a while, he did little else but fly all over the place promoting it. Not long afterwards, however, he found himself on his own, in an alien country, with a wad of money, but feeling distinctly uncomfortable.

"The first couple of years I didn't know what to





O'Connor's Apple Macintosh, running Pro Tools and a wide range of software, is the heart of his home studio.

do with myself. I felt like a fish out of water, my network of friends was in the UK, and my family was in Ireland. I also had to learn to attune my bullshit detector to American society. In your own culture, it's easier to spot someone who is just a big talker. Here, it took me a while to figure it out. There are many people here who can talk a great game, but don't have the talent to back it up."

Keen to take up something to keep him active, O'Connor quickly realised that he couldn't fall back on his London career as a studio owner. "There are so many studios here, there's no point starting another one. In California anyone with even the slightest interest in music has a \$100,000 studio at home, full of the latest equipment, and many of them are producing their own stuff. But it's often very bland; good ideas don't come from sitting around in a studio with nice equipment. So I put a little demo studio together, and I made some demos that I sent to a few record companies. Higher Octave Music, who were focused on the new age market, called me up, and said that they liked a few of the tracks, and asked me to do more in that vein, including some with samples on, like pan pipes, which were popular at the time. In 1989, this became the first Eko album, called *Future Primitive*. It reached the Billboard new age top 10, and sold about 75,000 copies. I'm still very grateful to Higher Octave for spotting me and giving me the chance to get my music out there."

Eko Friendly

Eko is Sanskrit for 'one' and the project consisted of O'Connor (who wrote all the music) together with reputable sidekicks like keyboardist and

programmer Paul Ellis (who had worked with a varied spread of artists, from Billy Ocean and Alison Moyet to The Sugarcubes), and eminent violinist Bob Loveday (one-time member of the Penguin Café Orchestra). The music was a pleasant, optimistic blend of new age and folk music. With *Future Primitive* exceeding initial sales expectations, O'Connor seemed set for another stint at hit-parade success and jet-set lifestyle. But things didn't quite work out like that. Eko's follow-up albums, *Logikal* (1992), *Alter Eko* (1994) and *Celtica* (1996), failed to sell in such large quantities as the debut (about 30,000 each), and somehow the compromises that O'Connor had to make to get this music out started to grate on him: "The first two albums had quite a lot of drum machines, synths and samplers on them, and I found that I wasn't listening to those albums. I really like music that I can have a long-term relationship with; the stuff that really connects with me is recorded in a very heartfelt way. I started to feel that the synths were getting in the way of the guitar playing; they were little more than window dressing, and largely there to make the record company happy. I prefer records that are more pure-sounding, like Jan Garbarak's saxophone music on ECM, or the album Ry Cooder did with Ali Farka Toure."

It turned out that O'Connor's true musical tastes were neither as throwaway as they appeared from 'Star Trekkin', nor as mainstream new age as they seemed from *Future Primitive*. He cut down on the synths and samples, but found that he wasn't satisfied with his next (and last) two releases under the Eko banner. The final Eko album, *Celtica*, had a

► Celtic music flavour suggested by Higher Octave, because Celtic music had been very popular in the US in the previous few years. Although O'Connor was happy with the recording sessions, he wasn't pleased with the mixes that were done in-house by Higher Octave, and found himself not listening to this album either. "I was happy with the tunes and the playing, but I felt it lost something during mixing and mastering," he remarks, but adds fair-spiritedly: "Record companies will always look at ways to sell music, and Higher Octave never pushed me further than I wanted to go. And I'd rather sell *some* albums than be a starving purist. That's a decision that everyone has to make. So I made some concessions on those albums. I don't regret them, but I just don't feel as close to them now as I might."

"When I look back and ask myself whether I have done anything worthwhile, it's my relationship to the acoustic guitar that I value most. The CDs, the novelty hits, the music for *King Of The Hill*, they are things that I am lucky enough to be able to do to sustain a studio and a lifestyle where I can do what I really need to do, which is play the guitar. I keep coming back to the joy and satisfaction which comes from that."

O'Connor explains that his home studio started from modest beginnings in the late '80s, expanding to one ADAT and one DAT recorder, and a small computer system with *Sound Designer* editing software a few years later. "I could not believe what you could do with *Sound Designer* and the ADATs; it was wonderful. I think that the ADAT will eventually be seen as a really huge leap forward in the history of record-making; it certainly made it possible for me to make my last three albums the way I did. Often, I would record the demos here, and then take an ADAT recorder over to Bob Loveday's house or Paul Ellis's place, set it up in a living room, and record there."

These days, O'Connor's studio is where he writes, plays, and records all his music for TV, apart from orchestral work and occasional guitar overdubs, which are done in LA. The heart of the setup is now formed by his Macintosh computer, which contains a 16-track Digidesign Pro Tools system, Digidesign *Sound Designer* editor, Opcode *Studio Vision*, MOTU *Digital Performer*, and Passport *Encore* as main software. "I now record all my music in my 16-track Pro Tools system, working out orchestral parts with sample CDs in *Digital Performer* or *Studio Vision*. If I'm working for TV, all that gets downloaded onto a Tascam DA88. Much as I like ADATs, they do have real problems locking up, which is why they are not used in the audio-visual industry. In that world, the DA88 is the standard." Oddly, given the importance of the machine for TV work, O'Connor doesn't yet own a DA88 — he just rents one in when he needs it. "Everybody is now waiting for tape to die out, and it would make sense to me to be able to store all your cues on hard disk and then ISDN them down to the office," he explains.

The well-equipped O'Connor studio also contains a Korg M1 workstation, a Mackie

24-channel desk, and an Akai S2000 complete with rows of sample CDs containing all manner of grooves, strings, and orchestral sounds. An effects rack boasts a budget Sony MP5 reverb, two Neve 9098 mic preamps, two Dbx160A compressors, a Tascam DA30 MkII DAT recorder, his Digidesign 888 Pro Tools I/O interface, Eventide H3000S multi-effects/pitch-shifter, and there's also a pair of Mackie HR824 monitors. His favourite microphones are the Neumann KM184, Audio Technica 4030 and Shure SM58; he uses the KM184 and 4030 mainly for acoustic guitars, and the SM58 on his Fender electric guitar amp. Finally, he owns a little Roland PMA5 palmtop sequencer, which is "very handy on the beach. I once had to do 30 different demos for *King Of The Hill* in a 24-hour period, and the Roland was really useful for getting my ideas down quickly."

Brutal

As O'Connor has already hinted during our interview, the job writing music for this cartoon series has been his most lucrative TV work so far; *KOTH* is a top 20 show in the States and won a BMI Award this year. O'Connor's involvement in the series started in January 1997, when the production company which makes the cartoon, Judgemental Films, invited him and seven other composers to write the music to the first 13 episodes. They gave each composer one or two episodes to do whilst they were looking for the style that would best suit the program. After that first season they settled on O'Connor and two other composers, and the former Briton now finds himself fully stretched to provide the music for these shows, which go out every Sunday night in the US.

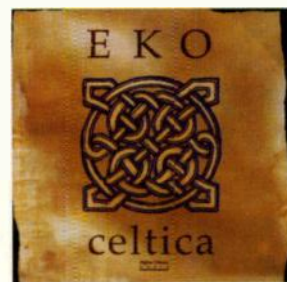
O'Connor: "The schedules are really brutal. I have just over a week to write, arrange and record the music for one show. There are about 15 scriptwriters and the amount of care they take is amazing. It takes about nine months to take an original story idea to completion. Most of the animation work is done in Korea, and after it comes back to the US I get a rough cut of the show, about three weeks before the show goes out. So the music is done at the last minute; I meet the producers in Los Angeles for the spotting session, usually on a Thursday or Friday just over two weeks before the show is scheduled to air. I may have already worked out some ideas to the rough cut, just doodling on the guitar while watching the video, and recording it straight into Pro Tools. During the spotting session we watch the show and discuss where we need the music to go, what the style should be, and how large an orchestra we need."

"There are usually 25 to 35 cues, so I go home and demo the music in Pro Tools. Then, a few days later, we have another meeting in LA where I'll play the producers the video with my ideas, to see if I'm going in the right direction musically, and which cues need to be rewritten or altered. The orchestral sessions are usually on the Thursday or Friday a week before the show goes out. On



This may be a home studio, but top-quality effects and processors are not lacking (see main text, left).

"Record companies will always look at ways to sell music... I'd rather sell *some* albums than be a starving purist."



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► Wednesday or Thursday afternoon, I transfer the MIDI files of my orchestral parts from *Digital Performer* or *Studio Vision* into *Encore*, which is my music composition software, and I'll fax or email those files to the 20th Century Fox music library, where music copyists are standing by pretty much 24 hours a day to write out all the parts for the orchestra. I then lay my tracks and a click track on a DA88, go down to LA, and conduct and record the orchestra, which is recorded on two tracks. Occasionally I will play guitar with the orchestra if a certain cue demands it. Normally my stuff and the orchestra combined does not exceed eight tracks, because we mix everything to stereo pairs, but sometimes we go up to 16 tracks.

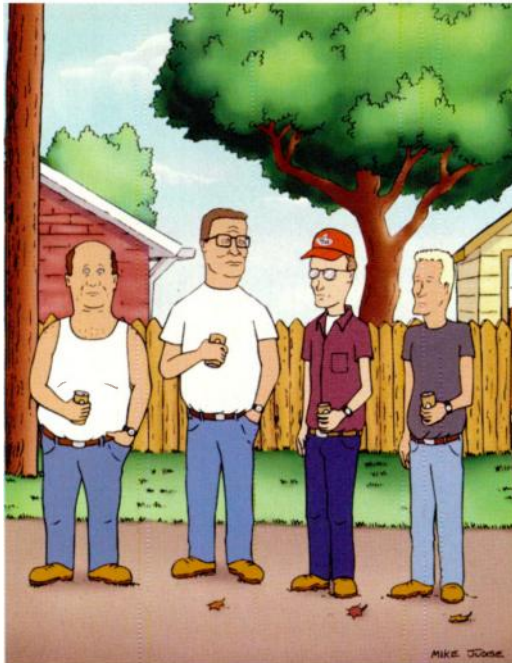
"Even after that session, we may need to do some more tweaking, so often I'll take the DA88 tape back home, throw it into *Sound Designer* or *Pro Tools* for editing, redo some guitar parts and make a few more changes. I have been known to email little bits of music to LA as AIFF files for last-minute fixes! We then pass the music on to post-production, who spend two days mixing the show, adding dialogue, sound effects, foley and music. The finished show is often aired within a week of completion."

Precious

As if the *King Of The Hill* music recording schedule isn't already gruelling enough, O'Connor also explains his amazement and admiration at the attitude of the show's producers to the music, and how their expectations stretch him. "The producers are really experienced guys. Many of them have worked on *The Simpsons*, and the music editor regularly works with Martin Scorsese. They know absolutely what the effect of the music is likely to be, or the effect of having *no* music at all. They see music in a totally different way from me; they're not interested in how well you can play, or how you write. They just want music that can help sell a scene or transition between scenes, or convey the passage of time. One thing you have to avoid is being funny. *King Of The Hill* is already a funny show, and music that tells the audience what they're watching is funny just kills it. We treat the show as a drama and underscore the characters' emotions.

"A few weeks ago, I did a scene where the guys were watching the Super Bowl on TV. We needed sports programme music coming from the TV, then a few commercials, cutting into religious music from another TV channel, and then into a long sequence with orchestral '40s Hollywood music — and all that in the space of three to four minutes! Your job as composer for the show is to solve these sorts of musical problems.

"They say that to write music for television you need thick skin and no ego, so you can't be precious about your music. Last season, I wrote maybe 400 or 500 little pieces of different styles of music that I would never have written otherwise; it has really pushed me into new areas. I am learning how to conduct and write for orchestra and write in all sorts of musical styles, like big band jazz, or as



O'Connor insists that his music for *King Of The Hill* works precisely because it doesn't try to be funny.

though I was scoring a classic '50s Hitchcock movie. Many people who work in home studios don't have the chance to try out their music in other environments. I'm lucky enough to have the chance to record real orchestra and guitar in a pro studio, then bring the tapes back and compare them to my own demos here. I learn a lot from that."

A Pure Voice

"I think I have a slight addiction to studio gear, which I know many people have. I have heard really good music made on much lower-quality gear than I have, but I still like to have the best equipment I can afford — I get upset when equipment doesn't work. It's the one thing guaranteed to take me out of a creative state of mind. Also, as new technology arrives, people's expectations of what's possible also change. Now that it's possible to deliver high-quality demos of 30 pieces of music in a couple of days, you're deemed not quite ready to work in the business if you can't provide that, so I need equipment that is fast and reliable. I don't want anything to be a problem for me, like the ADATs failing to lock up; you get pissed off and lose the thread of what you're doing. The technology I have fits nicely together, and it works, although I suppose there will always be problems with hard disks and systems, which means you have to become your own technician.

"Overall, I think technology will keep on developing and getting cheaper and better, and I will continue to upgrade. I'm looking forward to buying various TDM plug-ins, and I hope that soon I'll be able to master my own albums here. My relationship with Higher Octave and *King Of The Hill* have made this studio possible, and taught me a lot about the way I approach music. The Higher Octave albums are fun, but I can also see them as a failure on my part to dig deeper, to go where the deeper emotions are and bring them out. I think that's what people respond to. The fun stuff will be forgotten in six months. It's uplifting for a while and serves a purpose, but as a musician I want to contribute more to people's lives when they hand over their hard-earned cash for one of my CDs. I think you do them more of a service when you dig deeper and give them a purer voice to listen to." **SOS**



"King Of The Hill is already a funny show, and music that tells the audience what they're watching is funny just kills it. We treat the show as a drama and underscore the characters' emotions."

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Paul Nagle, Sound On Sound, April 1998.

An anecdote about Patch synthesisers.

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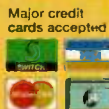
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YAMAHA SW1000XG

sonics and daughters

**YAMAHA SW1000XG
AUDIO/MIDI PCI CARD**

The SW1000XG soundcard is nothing if not versatile. For one thing, it provides an impressive 64-voice XG synth, with up to 32 multitimbral parts. On top of this, it also has six stereo Wave audio busses, for playback of up to 12 mono audio tracks using a hardware-controlled mixer. Best of all, however, are its five 24-bit effects/dynamics busses, which can be used by either MIDI or WAV sounds, and a palette of over 70 different effects types, including not only the more usual reverbs, chorus, and delays, but also more exotic types like guitar amp simulators, aural exciters and talk modulators.

Just in case you missed that small but important phrase in the last sentence, let me say it again: the five-buss effects engine can be used by both MIDI and WAV sounds. This is a major step forward in integration, especially since you can also route the

MIDI sounds to be recorded as a WAV file (complete with effects), either to release special effects for other use, or during final mixdown, thus keeping the MIDI sounds entirely in the digital domain.

In addition, the SW1000XG has a daughterboard socket, for which three juicy additions are so far available. If you fancy adding some physical modelling facilities, there is the PLG100VL synth which provides a VL70m with 326 monophonic synth sounds for £119. Alternatively, the PLG100VH gives you three-voice vocal harmonising capabilities for £99. There's also the £199 PLG100DX, which effectively gives you a six-operator FM synth, with all the benefits of computer-based editing (including 912 preset and 64 custom FM synthesis voices), but minus the background noise of the original DX7.

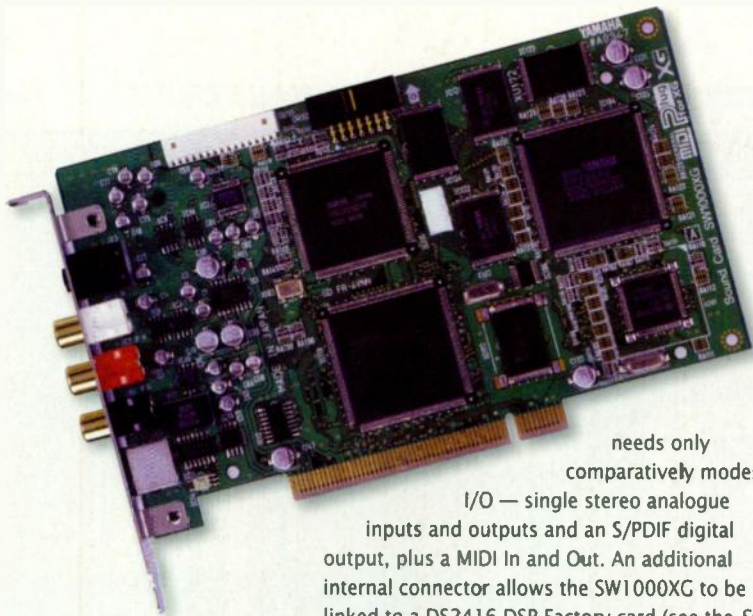
Since the SW1000XG is so self-contained, it

Yamaha's latest PCI soundcard is a synth, a mixer and an effects unit in one.

Martin Walker finds plenty to talk about.



There are plenty of sequencers around, but you won't find any others that feature a DX simulator and VL synthesis editor! This is the capable XGWorks MIDI + Audio sequencer that is bundled with the SW1000XG.



needs only comparatively modest I/O — single stereo analogue inputs and outputs and an S/PDIF digital output, plus a MIDI In and Out. An additional internal connector allows the SW1000XG to be linked to a DS2416 DSP Factory card (see the *SOS* review in the October '98 issue) to create a more powerful system, providing a larger complement of analogue inputs and outputs.

Installation

The SW1000XG is a PCI expansion card, and at seven inches long should fit into all but the most compact machines. Most of its larger chips are of Yamaha's own design, which presumably helps to keep manufacturing costs down. The backplate connectors consist of a 3.5mm stereo jack input socket, a pair of gold-plated phono sockets for Left and Right analogue outputs, a further phono for the S/PDIF output, and a PS/2-style 6-pin connector for MIDI use. Before you panic, I should point out that an adaptor lead is also provided, with a 6-pin PS/2 connector at one end, and two 5-pin DIN plugs for MIDI In and Out at the other. At 1.6 metres long, this should suit most installations without needing an extension. There are two additional connectors on the top edge of the card — one for attaching a daughterboard (see the 'Daughterboards' box) and the other for linking internally to the DS2416 DSP Factory card.

Along with the SW1000XG, I was also sent two of the daughterboards — the PLG100VL physical modelling synth, and the PLG100DX FM synthesizer. They are similar in size to the DB50XC, and a set of four click-in pillars and a short ribbon cable is provided with the soundcard to attach them. Although this is simple to do, you will certainly need to piggyback your choice of daughterboard before installing the soundcard in your PC, (and as usual) the combined width will obscure the next expansion slot. Currently, only one daughterboard can be fitted to the SW1000XG at any time, although some rumblings have been heard about multiple card expansion possibilities in the future. You will need to remove the entire soundcard again if you ever change daughterboards.

MIDI Sounds

Given Yamaha's good reputation for ease of installation, I wasn't unduly surprised to be up and running five minutes after opening the box —

drivers for both audio and MIDI are on the supplied CD-ROM, and take a single IRQ and 256Kb of I/O memory between them. I managed to install them with my Event Gina and AWE64 Gold cards intact and still running!

There are three MIDI Outs altogether (a total of 48 channels) — Parts 1 to 16 of the synth use the first, Parts 17 to 32 the second, and the external MIDI out socket uses the other 16. The first thing I tried was auditioning the 20Mb ROM set of SW1000XG MIDI voices alongside my trusty DB50XC (which only features a 4Mb ROM). My first impression was of clarity and precision: compared with the DB50XC, every sound had an added 'zing', resonance or attack, and the reverb algorithms were more clean and natural. The background noise was also considerably lower.

The SW1000XG uses the same basic XG sound bank in the main, but some sounds, such as the Grand Pianos and Pan Flute, are obviously completely new samples. These also have a greater number of multisamples, resulting in less obvious transitions and a more natural sound when playing up and down the keyboard. Many of the loops were also considerably longer, as you might expect given more ROM.

Using the latest version 2.6 of *XGEdit*, which now directly supports the SW1000XG, I was also able to explore the additional sounds available in the other banks. Most of these are derived from the MU100, and are uniformly good. Almost every category of instrument has at least double the total number of choices compared with other XG modules, and there is also a completely separate set of 22 'MU100 Exclusive' sound banks containing many other new and unusual sounds. There are also far more drum kits, including a techno set. Anyone considering replacing their DB50XC or SW60XC should find most existing tracks sound very similar on playback (albeit somewhat cleaner and quieter), but will probably be able to find many similar but improved sound options from the new banks.

Audio

The 12 mono audio playback channels of the SW1000XG appear to Windows as six stereo pairs (SW1000 #1 to #6 WAVE OUT), and again one of the easiest ways to see what's on offer in the hardware mixer portion of the soundcard is to use *XGEdit*. A click on its 'Launch A/D panel' button will launch the virtual 'Analogue' mixer.

Though they are grouped as six stereo pairs, each of the 12 channels has a comprehensive range of controls including a level fader, rotary pan control, and four more rotary controls for Reverb, Chorus, Variation, and Dry (see the Effects section for more details). The upper section of each channel provides various controls for setting up MIDI automation (see the Software Support section later on). To make things easier for stereo tracks, a small virtual LED above each stereo fader pair can be clicked to gang the controls together. Both MIDI and audio channels in the on-card mixer also have switchable output routing, either to the

YAMAHA SW1000XG £449

pros

- Excellent XG MIDI sounds.
- High-quality effects can be used with MIDI or Audio channels.
- Polyphony and synthesis types expandable using daughterboards.
- Wide range of software support.
- Doesn't require a super-fast PC.

cons

- No S/PDIF input.
- Mac and PC ASIO drivers not yet available.
- Initial PC drivers not multi-client or DirectSound compatible.

summary

As an all-in-one solution for audio and MIDI recording and playback, complete with a plethora of high-quality effects, the SW1000XG should have competitors quaking in their boots!

SOUND ON SOUND

YAMAHA SW1000XG

► main stereo output, or to one of a selection of DSP Factory busses if you have one of these cards connected. When using an audio sequencing package like *Cubase VST*, you can still use its full complement of software-mixed audio channels, but any 12 of these (or submixes) can be re-routed through the SW1000XG's on-card audio channels for adding effects.

There are two pairs of soundcard inputs (SW1000 #1 and #2 WAVE IN). The WAVE #1 input lets you monitor an incoming audio signal at the external Input socket with added effects, though keeping the recording itself dry, which lets you audition effects during real-time recording without committing yourself. Input sensitivity can be switched between Mic (default) and Line, but there is no separate software-controlled input level control.

The WAVE #2 input allows you to record the entire stereo output from the SW1000XG, which includes any signal at the external audio input, any MIDI parts currently playing, and any of the 12 audio playback channels, all complete with any of the built-in effects being used. This is an ideal way to mix down an entire song digitally on to a single stereo pair of audio tracks.

I tried my normal noise test for the A-D converter, and measured background noise at about -92dB unweighted (which should rise by several dB to be in line with the published -94dBA figure when weighted). The audio drivers can apparently record at up to 24-bit resolution (although of course only the highest 20 bits are valid from the A-D converter) but recording and playback of files of greater than 16-bit resolution depends on the application — patches are likely to appear that make this possible for various existing packages.

Effects

As on the DB50XG, both global and insertion effects are available, but the SW1000XG is greatly improved in both areas. The Reverb and Chorus busses have a wide range of quality sounds available, and these are generally cleaner and quieter than before, with



better algorithms — they are identical to those provided in both the MU100R and the A3000 sampler. The Variation buss has a hugely increased complement of 70 effects, including some more unusual ones such as a licensed version of the Aphex Type C Aural Exciter, and the Talk Modulator (this sweeps at a variable speed on demand between the A, E, I, O, and U vowel sounds).

Individual effect level controls are available for each MIDI and Audio channel for both Reverb and Chorus, while the Variation buss can be switched between System (so that you can add a third global effect with variable depth to every channel) or Insert (where you apply it to one channel in isolation). The Variation and Dry controls in both MIDI and Audio mixer channels become active if the variation buss has been set to System.

There are also two Insertion effects, which can also be inserted into any single MIDI or Audio channel, which makes them ideal for adding distortion, touch wah, or a different reverb treatment to make one voice stand out. ►

The latest version 2.6 of XGEdit has been enhanced to provide SW1000XG support, including full access to the huge extra number of extra MU100 voices, as well as those of any connected daughterboard (here the VL voices are available).

Daughterboards

Yamaha's original DB50XG arguably brought professional synth quality to the (at the time) relatively humble PC soundcard. Many subsequently launched soundcards featured a Waveblaster-compatible 26-pin daughterboard socket, and some rival companies even advertised DB50XG compatibility as a feature. Yamaha have now produced their own more advanced daughterboard standard — PLG (Plug-Ins), which has 15 pins and attaches to the host card via a short ribbon cable rather than a fixed plug/socket arrangement.

The current range of three daughterboards were originally destined to be released for use as expansion with the MU100 and forthcoming MU128 tone generators, and both the PLG100VL and PLG100VH boards are pre-fitted to the MU100R module (reviewed in the November '97 issue). Since their output is of the digital variety, audio quality is very high: the PLG100DX, for instance, has a quoted signal-to-noise

ratio of better than 95dB analogue, and greater than 100dB via the digital output of the SW1000XG.

Unlike the sound expansion boards used by synths such as the Roland JV1080 and JV2080, each daughterboard contains a new form of synthesis, rather than simpler ROM-based sound additions. Another advantage is that the PLG series add polyphony to their host instrument (or an additional 'PLG Harmony' buss in the case of the Vocal Harmony board, which I have yet to hear).

The PLG100VL daughterboard adds a VL70m-style physical modelling synth to the SW1000XG. Though it has no breath control input, the system is designed to respond to breath control data, so it would still be possible to use it with something like a Yamaha WX-series controller, or one of the Anatek Wind Machine modules. If you are using XGEdit, the new VL preset voices simply appear as an extra menu option when choosing a voice in any channel. As expected, the VL voices provide exactly the same range of expression and finesse as the VL70m module — at £119,

therefore, this daughterboard is an absolute bargain.

The PLG100DX is essentially a DX7 synth with six-operator FM synthesis, but with over 60 effects and more user-friendly editing. The beauty of the PLG approach is that the daughterboard's 16 notes of polyphony are added to the polyphony of the SW1000XG, giving a total of 80 available notes! Given the upsurge of interest in all things FM (see Derek Johnson's review of the Yamaha FS1R synth module on page 28), I expect this to be a big seller as well, since there is no substitute for real FM — samples of FM are only a snapshot, and don't have the changing timbre with velocity of the real thing.

The daughterboards come with plug-in editors that integrate with the XGWorks sequencing application (see main text) — these are comprehensive and work well. If you intend to use another sequencing package, there is already a stand-alone VL editor available, but the plan is to provide an XG shell utility that will allow you to use any or all of the XGWorks plug-in editors as a smaller stand-alone package.

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YAMAHA SW1000XG

▶ Finally, those used to the DB50XG will be pleased to discover an additional 5-band parametric EQ on the main stereo output (Yamaha claim this as a 6th effect buss), and an additional 2-band low/high EQ on each MIDI channel — this in particular is extremely useful for removing low end on lead sounds to clean up a mix.

It is also possible to use a pair of the internal playback channels to run a software synthesizer such as Native Instruments' *Generator*, which then gets access to the built-in effects. However, the Yamaha drivers are unfortunately not yet DirectSound compliant, so latency was fairly high, and you cannot therefore use either *Reality* or *Gigasampler* (see this month's PC Notes for details on DirectSound driver capabilities).

Software Support

Yamaha bundle with the card the *XGWorks* application, which provides MIDI + Audio recording and playback of up to 100 tracks, a Wave editor, and an XG editor (see screenshot on page 212). This provides more than enough to get anyone started, without swamping them in technicalities. It is a full version, and though it's initially easy to use there is lot of control lurking under the surface. Although I suspect that the majority of *SOS* readers are likely to use a different sequencer package such as *Cakewalk*, *Cubase*, or *Logic*, this is a very capable and useful addition to the SW1000XG package.

One of the beauties of the integrated *XGWorks* design is that you never get the dreaded 'Device already in use' message when attempting to simultaneously access the card from separate editor and sequencer applications. Sadly, the SW1000XG MIDI drivers themselves are not multi-client (which is odd, since Yamaha managed it with the SW60XG). However, a floppy disk is also supplied which contains the freeware *Hubis Loopback* utility. This provides any MIDI input or output with multi-client capability, so that you can access it simultaneously from any suitable editor and sequencer. The Loopback utility is fairly simple to set up, but will still be confusing for the novice, since it adds extra entries to the MIDI list (and may possibly cause problems with the Win 95 MIDI device limit).

Automation

The biggest difference between Yamaha's SW1000XG and the DSP Factory is in the way they are controlled. Whereas the latter must be accessed using low-level API functions, which allow software developers to provide access to its features in individual ways, the SW1000XG can be totally controlled by MIDI, using either SysEx or controller data. Those who quake at the thought of SysEx editing need not fear, however, since there will be a knob, fader or button available in a variety of applications that generate the appropriate data for you to twiddle. This can be recorded direct to your sequencer package for real-time MIDI automation.

For audio automation, you can still use applications like *Cubase* to directly control real-time

Brief Specification

- **AUDIO**
 Analogue Inputs: 2 (20-bit Burr Brown A-D converter).
 Analogue Outputs: 2 (18-bit 64 times oversampled NEC D-A converter).
 Digital Output: 1 S/PDIF (coaxial).
 Internal resolution: 24-bit.
 Recording tracks: 1 stereo/2 mono using external analogue inputs, 1 stereo/2 mono using internal loopback.
 Playback tracks: 6 stereo/12 mono, mixed using internal hardware mixer.
 Sampling rates: 44.1kHz recording, 48kHz, 44.1kHz, 22kHz, 11kHz, 8kHz playback.
 Signal-to-noise ratio: >94dBA.
 Total Harmonic Distortion: <0.02%.

- **MIDI**
 Synth: 64-voice polyphonic, 32-part multitimbral, using 20Mb ROM.
 Internal voices: 1074 in XG Mode, 614 in GM mode (1267 total voices).
 Drum kits: 36 in XG Mode, 10 in GM mode (46 total drum kits).
 MIDI: 48-channel MPU401 hardware-compatible (32 internal channels to synth, and 16 channels to external MIDI port).
 • **EFFECTS**
 Five independent effects: Reverb buss (12 types), Chorus buss (14 types), Variation buss (70 types), Insertion 1 buss (43 types), Insertion 2 buss (43 types).
 • **EQ**
 Stereo Output: 5-band parametric EQ (four types).
 All MIDI parts: 2-band shelving EQ.

mixing, but using the Yamaha hardware mixer will be far less processor-intensive. Fader movements can be set up and recorded using an application like *XGEdit* 2.6, and then the mixes will be recorded as MIDI events, which will be far less processor-intensive than real-time audio-level automation.

Support is most definitely not going to be a problem; even before its release there were mixer maps finished for *Cubase*, a Studioware panel for *Cakewalk Pro Audio* 6 and 7 users, and an Environment page for *Logic Audio* — all are supplied on the CD-ROM. Other manufacturers providing specific support including Kenton, whose Control Freak (reviewed last month) will provide hardware control. A new web site (www.xgfactory.com) will keep everyone up to date with the latest developments.

Summary

As you've probably guessed, I think Yamaha have a winner on their hands with the SW1000XG. It's an exciting addition to their range, since it not only provides arguably the best MIDI implementation of any soundcard, but integrates MIDI and Audio internally while letting them both use any of the wide range of built-in effects — and of course the huge advantage of these, compared to DirectShow plug-in effects, is that they take up none of your main CPU processor time.

The SW1000XG's audio quality is easily on a par with that of most other high-quality soundcards. For those without hardware effects units to plumb in, or the desire to record more than a single stereo input at a time, the Yamaha SW1000XG will probably provide all you need in a single package (although some people will miss an S/PDIF input).

Since the DSP functions are self-contained, for once you don't need a really powerful PC to achieve good performance (unless you want to run DirectShow plug-ins as well). Even with a Pentium 166MHz MMX machine you will get good results, although a more powerful PC is likely to manage more audio tracks. Yamaha are promising Mac ASIO drivers with OMS and Freemidi support in December, along with updated PC drivers that are DirectSound compatible, as well as an ASIO version. There is even a mention of a Windows NT driver in the first quarter of 1999. **SOS**

Hardware Integration

Although the SW1000XG has limited inputs and outputs on its own, it can still form the basis of a more comprehensive and more powerful system. Of course it is well suited to partner the DSP Factory, but it is also perfectly possible to connect the S/PDIF output of the SW1000XG to the S/PDIF input of another make of soundcard (such as the Event Gina). In this configuration the SW1000XG provides the master clock source, and the second card could provide a much larger range of inputs (if you want to record drum kits or complete bands), or more outputs (as Aux sends to external effect units). The first driver release supports only a single SW1000XG card, but it is possible that two cards might be supported in sync in a future release.

Information

- £ SW1000XG £449;
 PLG100VH £99; PLG100VL
 £119; PLG100DX £199.
 Prices include VAT.
- Y Yamaha-Kemble Brochure Line
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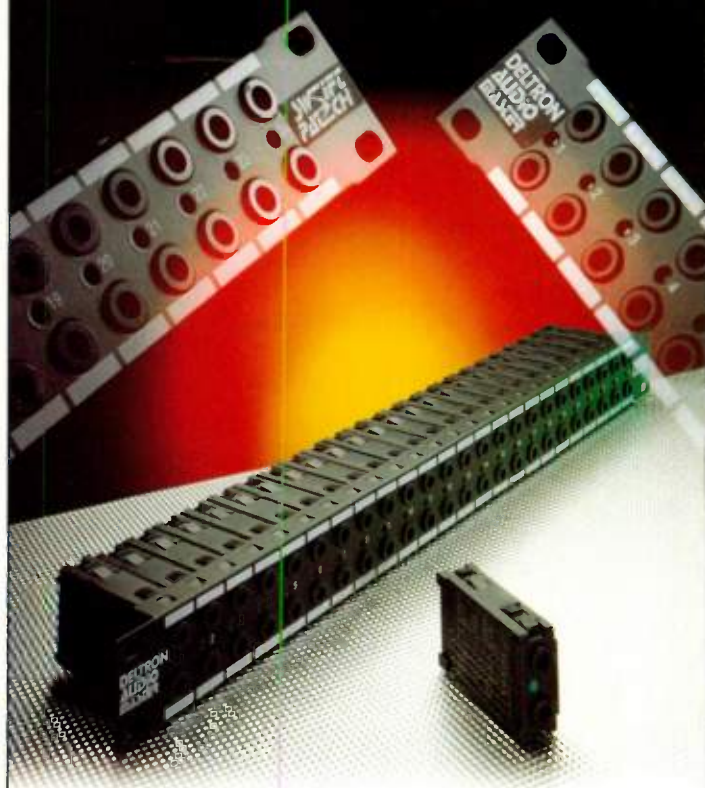
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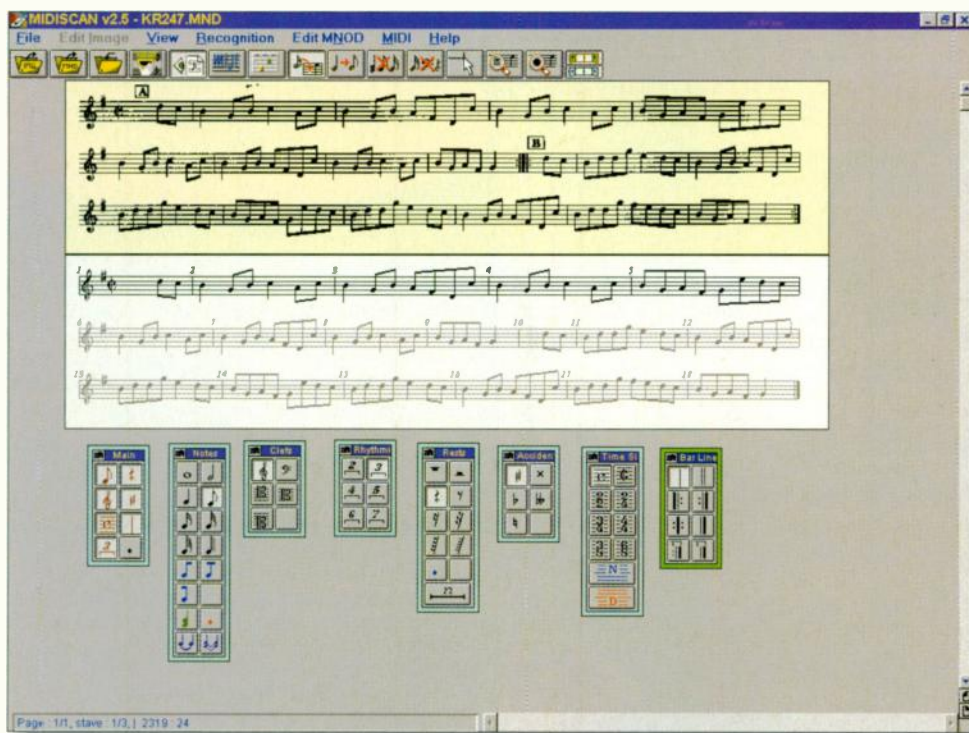
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MUSITEK MIDISCAN



The processed scan appears as an MNOD (Music Notation Object Description) file which can be edited using a wide range of object-oriented tools.

A new utility from Musitek claims to turn printed dots and lines into something non-score reading electronic musicians can get to grips with. **Janet Harniman Cook** gives it the once-over.

play it again

scan

MUSITEK MIDISCAN v2.51 SCORE TO MIDI FILE CONVERSION SOFTWARE FOR PC

The facility to print out your song in score format is a standard feature of MIDI sequencers, but porting printed sheet music over to the computer is a much more specialist task. With the assistance of your computer scanner *MIDIScan* 2.51 does just this, enabling you to transfer up to 24 pages of printed score to your PC as a GM-ready standard MIDI file. Each page of score can have a maximum of 16 parts, and after processing each part is assigned to its own MIDI channel. *MIDIScan* recognises note pitch, note duration, chords, rests, ties, accidentals, clefs, key and time signature marks, to a claimed accuracy rate of between 90% and 98%. After processing and editing, files can be printed and saved as a standard MIDI file, as a NIFF file (see the 'Niffy' sidebar on page 216) or in the *MIDIScan* native MND format for MNOD — more on this later.

PC requirements are modest — even low-end Pentium PCs and older 386 or 486 systems should be adequate, and typical figures given in the *MIDIScan* documentation give average processing times per page of 30 seconds for Pentium 100 and

three minutes for 386 SX-equipped PCs. Both TWAIN and non-TWAIN compatible scanners can be used but higher-quality, more reliable results will be obtained from flat-bed scanners — hand-held scanners should be avoided if possible, and results may be variable if page scanners are used.

MIDIScan

The *MIDIScan* package consists of a single floppy disk containing *MIDIScan* and a fully-licensed version of *Lime* NIFF notation software along with the user manual, an MNOD editor quick keys map, a brief guide to *Lime* and the registration documents. The 80-page spiral-bound user manual is clearly presented and contains tutorials, optimisation tips, scanning routines and a *MIDIScan* reference section covering icon and menu functions. Comprehensive Windows Help is available but Tool Tips are not implemented and, oddly, *MIDIScan* does not include an Undo function in its editor. The user interface is well laid out, if a little stark by Windows 95 standards, but the workspace is easy to navigate and contains icon-driven shortcuts for the principal

**MUSITEK
MIDISCAN £249**

pros

- Easy to learn and use.
- Surprisingly accurate.
- Faster than step input.

cons

- Works best with simple, undamaged scores.
- Dated interface not completely Windows 95 compatible.
- Expensive.
- No undo in Editor.

summary

Musitek *MIDIScan* v2.51 is simple to use and, despite a few minor quirks, does a very good job. If you need to scan printed scores and sheet music into your PC then check it out.

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MUSITEK MIDISCAN

► file, scanning, recognition, MIDI- and image-editing functions. Keybinds provide shortcuts which are generally straightforward, despite keyboard and mouse routines that deviate from normal Windows usage.

I Think, Therefore I Scan

Installation was uneventful and, after defining the scanner and MIDI I/O ports, *MIDIScan* was ready to go. Any scanner can be used, but TWAIN-capable devices are faster as the scanned TIFF file image is automatically imported into *MIDIScan*. The most accurate results will be obtained from crisply printed, high-contrast scores, but *MIDIScan* is relatively tolerant of skewed, damaged or poorly printed sheet music.

Recognition

Selecting the Begin Recognition icon from the *MIDIScan* toolbar opens the Recognition Setup dialogue. This is where the basic file characteristics are defined, such as whether the score is an ensemble or part score, and which part of its area will be processed. I ran into difficulties at this point, and was unable to get past this dialogue and load a scan. Consulting the user manual's Problem Solving chapter informed me that the probable cause of this was a 16-bit/32-bit Windows 95 conflict, and took me through a successful troubleshooting routine. I suspect that the source of the difficulty is that *MIDIScan* is not fully Windows 95-compatible. Be aware that you may encounter this problem, which is a little irritating but easily fixed.

Once the scanned file is selected, the recognition process starts; after a few seconds of frantic screen activity, the option to save the newly recognised MNOD (Music Notation Object Description) file appears, and the workspace reconfigures to display the editing tool icons and a split screen containing the original scanned image and the new MNOD file.

Editing And MIDI

The MNOD file editing features are limited to improving the appearance of the converted score and correcting any inaccuracies; more advanced routines such as structure editing are better performed in a more powerful dedicated sequencing application. There are two edit modes: Change mode allows the replacement of incorrectly recognised objects, and Insert modes allows new objects to be added.



MIDIScan enables printed scores and sheet music to be scanned into the PC and exported in MIDI or NIFF formats.

The MIDI conversion process is simple and the new file can be played back from the *MIDIScan* MIDI Sequencer — a rudimentary 16-track MIDI file player with single-port instrument definition and simple non-real-time playback parameter control including volume and transposition.

Conclusion

Music scanning software is surprisingly rare. Overall, I found that *MIDIScan* performed well when converting simple printed scores, provided they were in good condition — character recognition errors were more common from scores that were torn or creased. *MIDIScan* does not claim to be able to convert handwritten manuscripts, and the results I obtained when I tried were unusable. I was disappointed that *MIDIScan* did not recognise codas, although it was a simple task to add the missing sections to the MIDI file in *Cubase*. If you spend time transcribing and correcting simple printed scores of classical or pop music, or if you are a vocalist needing to create virtual accompaniments from sheet music, then *MIDIScan* will be a godsend to you, but don't expect miracles if you attempt to transcribe complex pieces — an accurate and aesthetically satisfying transcription of a Mozart violin concerto is still beyond the scope of both *MIDIScan* and the MIDI file standard! This said, for educational purposes *MIDIScan* will be a useful learning aid, and advanced users will find it a handy complement to the professional scoring facilities of MIDI sequencers such as *Cubase Score VST* or *Finale*. If you are working with solo piano or organ pieces, or duet scores, and do not require multiple stave conversion, *MIDIScan's* less expensive little brother *Piano Scan* (£89) is worth considering, as it provides most of the key features of *MIDIScan* but limited to twin staves of conversion. SOS

Lime

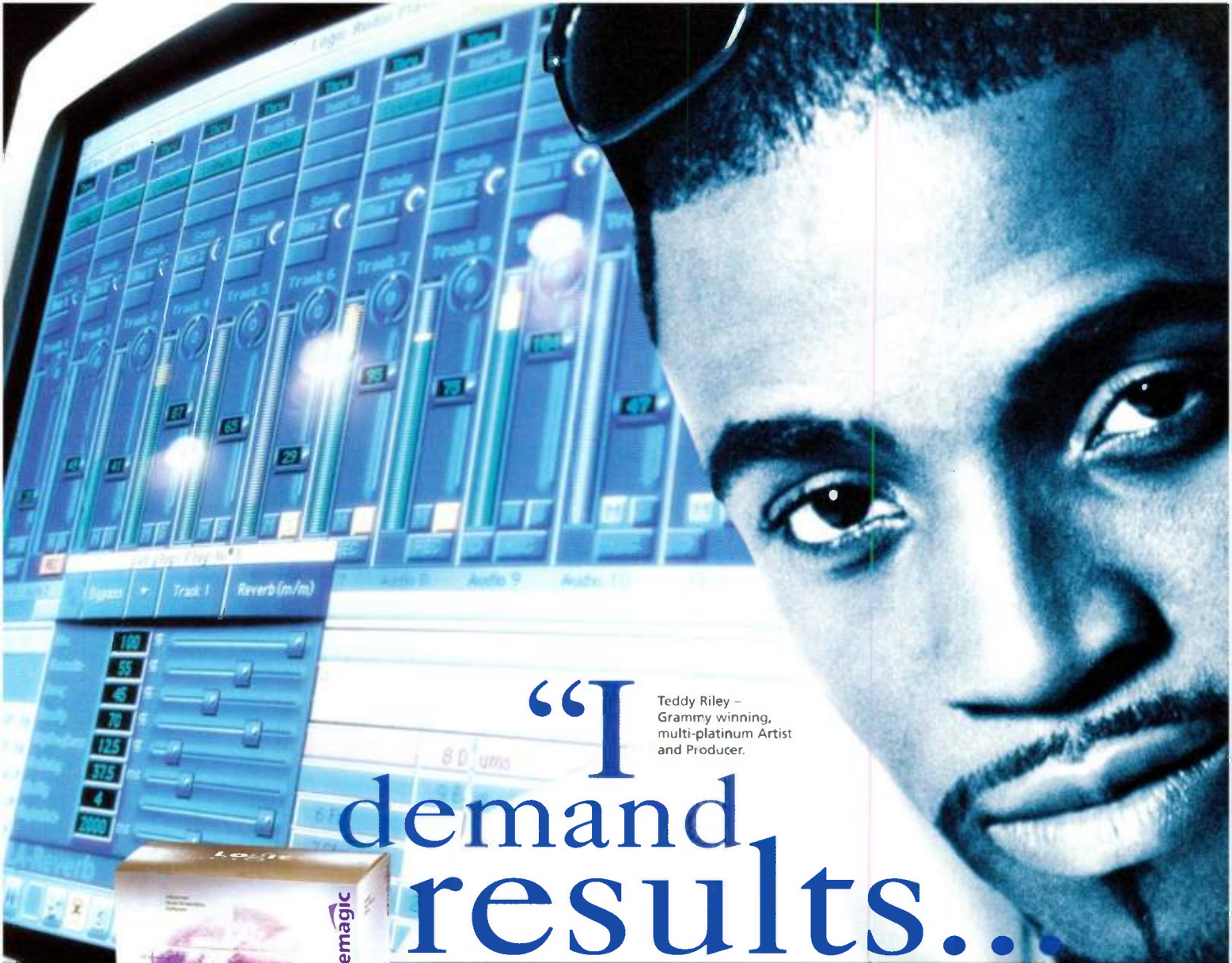
Lime is the free fully-licensed NIFF notation software that is bundled with *MIDIScan*. At the time of writing, *Lime* is the only PC application that will print out NIFF files. However, using *Lime* for anything other than the most simple editing routines is best avoided, and more sophisticated score editing features can be obtained without over-stretching even the most limited budget. One good example is *Cakewalk Home Studio 7* which, for £99, offers good basic MIDI staff editing and multi-port MIDI sequencing plus four tracks of hard disk audio recording with onboard DSP effects such as reverb and echo.

Nifty

MIDIScan supports Notation Interchange File Format (NIFF) which is the recently introduced open, non-proprietary, cross-platform data format specifically for the exchange of music notation information between sequencer applications. NIFF files not only include score page layout but also MIDI performance information, and given sufficient sequencer support, it is possible that the NIFF format will in time replace the Standard MIDI file format as the preferred medium for the exchange of musical data.

Information

£ *MIDIScan* £249
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worldradiohistory

You Should Not Have Returned, OBX...

Defining the 'classic' Oberheim sound

Regarding the excellent review by Simon Lowther on the Oberheim OB series synths [Retrozone, *SOS* September '98], I have used both an OBX and an OBXa extensively and would like to add a few words.

He accurately separates the sonic differences between the OBXa and the OB8, but seems to lump the OBX and Xa in the same bag. What you have to remember, however, is that the OBX has a very similar voice architecture to the earlier SEM, with a lot of the same components, and its sound is close enough to the old Eight Voice and Four Voice machines to warrant buying one and *not*

badly designed power supplies, that seem to be the bane of other magnificent polys such as the Memorymoog, Rhodes Chroma or Yamaha CS80.

I like both machines, but I feel that there is a definite line between the sound of the OBX and the Xa. It's a matter of taste really — SEM and OB1 fans should try the OBX, which excels at massive sweeping pads, while classic 24dB poly fans or Prophet owners looking for something with more guts (but less functionality) should try the Xa, which is great for punchy brass and earsplitting sync leads.

Adam T
via email

Simon Lowther replies: *There is a lot of discussion among Obie aficionados about what constitutes the 'Oberheim Sound', and which models sound best — and a lot of what Adam says is quite true. Oberheim's first synth, the SEM, was introduced in 1974. Its*

VCOs are based around a 3086 IC (this IC is just five discrete, matched transistors in one package, not a VCO chip). The rest of the circuitry uses 3080 and 741 op-amps — all very standard stuff, and the VCF is a 2-pole design.

The OBX, five years on, still used the 3086 for the VCO, but now with 2x Curtis 3310 envelopes. I think the original OBX also used the same 2-pole (12dB/octave) filter as the SEM, but it was set for low-pass response and not multi-modal as on the SEM.

All of the chips on the OBX's CPU/digital boards are in sockets, whereas on the voice boards (the analogue bits) only the Curtis chips

are in sockets — all the 741 and 3080 ICs are soldered in. I checked around with people who really know the insides of these things, who say they have never actually come across an Oberheim fault that was due to the chips coming out of their sockets. In fact it is a lifesaver that the chips are in sockets, since it provides the only way of doing a repair at a gig!

The OBXa is an all-Curtis design using 3340 x2, 3320 x2 and 3310 x2. It uses one 3320 VCF for 2-pole mode and one 3320 for 4-pole mode, which is a bit odd seeing as the 3320 is a multimode VCF chip! In the OBXa every chip is in a socket. An internal inspection showed that the OBXa actually uses the same plug-in connectors on the voice boards as the OBX. I have to disagree politely with Adam concerning the pin connectors. This form of connector is one of

the most reliable possible, as the connector is a rigid pin that goes through the screwed-down PCB. The connection cannot actually fall off, whereas the ribbon cables had DIL header-type sockets that are prone to breaking.

I believe the classic Oberheim sound is that of the 2-pole filter design: it was used on the original Oberheim synths that put the company on the map, and was deliberately designed to complement the established Moog and ARP 4-pole filter sound of the day. A 4-pole filter is always going to have more punch, as the filter sweep is controlling the harmonics more tightly, but a 2-pole filter has the fuller sound.

Finally, with the benefit of hindsight I would like to make one amendment to the original article. I said the OBX is best left to collectors, but I think this was a bit harsh — let's just say enthusiasts!

Many thanks to Andy at EMIS for additional information. ■

MU + ST = XTC

Hidden features in Yamaha MU10

Having read about Bryan Rooney's problem concerning input distortion on the Yamaha MU10 (Crosstalk August 1998), I would like to offer two solutions to his dilemma:

1. The input gain can be changed from line to mic by sending the following SysEx message: (decimal) 247, 67, 16, 76, 16, 0, 0, 0, 247. Correspondingly, you can change it back to line level by sending 247, 67, 16, 76, 16, 0, 0, 1, 247. The MU10 uses its internal effects to process the input signal: you can select the MIDI channel used to control these effects by sending 247, 67, 16, 76, 16, 0, 4, n (0-15), 247, where n is the MIDI channel.
2. Get a printout of the manual which comes with the unit, which only exists on the MU10 CD in the form of a PDF file.

Atari ST users please take note — despite certain retailers advertising the MU10 as PC/Mac-specific, it does in fact work excellently on the Atari ST with no additional hardware (except for a MIDI lead!). Couple this with the STM cartridge, giving an additional 16 MIDI channels, and you can have a 32-channel XG setup with independent effects for less than £250! Aren't Yamaha wonderful?

Dave Harris
Westbrook ■



Oberheim's OBX: best left to enthusiasts?

leaving it to gather dust in a collector's display. Much as I like the Xa, its Curtis 3320 VCFs seem to rob the machine of the 'organic' quality that make the old SEM (and the OBX) so wonderful (maybe they should have tried the nicer 3350, as used in the Chroma and Synton Syrinx). The Xa definitely has more 'punch' and should really be classed as the start of a new line. The 'classic Oberheim' sound seems to be the Xa in punchy 24dB mode — you'll never hear it from an OBX or SEM.

Regarding their questionable reliability, the cause of most of the OBX's temperamentality is its stupid pin connectors to the voice trays, which often need cleaning (or, ideally, modifying!). The Xa, on the other hand, uses ribbon cables, which are fine. Both synths suffer chip creep (where chips work their way out of their sockets due to movement), but neither seem to have the terminal ills, such as

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Worldradiohistory

Clock Watching

Externally clocking a DAT machine

Thanks to Hugh Robjohns for writing the six-part series on digital audio (SOS May-October '98)! A lot of questions I had were answered, especially about clocking. However, a few questions remain...

Say you have a DAT recorder with a bad internal clock and connect a very accurate external master clock to it, will the DAT machine be able to behave as accurately as the external clock? Can the DAT's playback system behave that accurately, or will the improvement in accuracy only be somewhere between the DAT's original

source. Some machines will automatically lock onto a valid signal on the S/PDIF or AES-EBU input during playback, but certainly not all. Check carefully!

The advantage of providing a stable external clock is that, in a situation where the DAT is feeding a digital mixer, you can arrange for the data to arrive at the appropriate time. If the DAT is providing an analogue output, the more stable the clock, the better the output resolution and the lower the noise floor (within the limits of the converter technology). So the answer to your question is 'yes' — the performance and usability of most suitably equipped DAT machines can be improved by feeding them with an ultra-stable external word clock.

With regard to the comment you quote in the second part of your letter, I was not

world of television music. I am certain David Ferguson's comments in the October '98 issue of *Sound On Sound* will strike a chord with many working in this field.

I am a relative newcomer, having written just over 50 TV packages in the last few years, but even in that short time I have experienced disturbing changes in rights ownership. At the start of my career, no-one was interested in publishing rights, and composers generally enjoyed 100 percent of Performing and Mechanical royalties. Now all that has changed, and the balance has tipped firmly in favour of the television companies and their multi-national publishers.

We are increasingly pressurised to surrender the publishing rights, which amounts to the loss of half our income. In addition, we may be approached with dubious 'buy-outs' of all Mechanical income. Some publishers even write into their contracts a percentage to cover administration for distributing royalty payments. In some cases the creator of outstanding original music may be coerced into giving up 80 percent of his or her entitlement.

These people are employing our services and preying on our greatest fear — where will the next job come from should we decline their 'offers'? This same fear prevents me from putting my name to this letter — these walls have eyes!

Writing music for the media is already hard enough. It is virtually standard practice now for producers to approach as many as six composers for one job. Five will be disappointed and will have worked for nothing — 'demo' fees are but a pipe dream. The successful writer is then expected to relinquish 'all rights in all media throughout the world in perpetuity' for a fraction of the money they might have seen a few years ago.

If publishers and media companies continue to exploit composers in this way, their own productions will suffer. Studios must be maintained and upgraded to meet the highest demands for quality. If they weren't, we would all be writing film soundtracks on Bontempi organs! Much as we love to employ session musicians, budgets rarely stretch to such luxuries, and feeding the family comes first.

It is time that the big music and copyright organisations stepped in to outlaw the bully-boy tactics and ensure that the rights of the composer (ie. the one who has done the work) are protected. I fear for the future of my profession, and will be writing to all the major societies (ie. PRS, MCPS, APC, MPA) in the hope that something will be done — and done soon!

'I Wright' ■



Not many mid-price DAT recorders offer word sync connections — this Fostex D-15 is an exception (see BNCs at top left of rear panel).

clock and that of the master clock?

In part 6 of his series, Mr. Robjohns writes that "some well-known digital mixers are specified as employing only IEC level II internal clocks, so watch out!" I'm planning to buy a Yamaha O2R mixer, and I am concerned about Hugh referring to this mixer. Can he tell me anything about the O2R's internal clock? Do I need an external clock, and which external clock generators would he recommend? The issue of jitter was also raised. Can jitter figures be found in most product specs?

Menno van der Grijspaarde
via email

Technical Editor Hugh Robjohns replies: I'm glad you found the series useful, particularly with respect to clocking, which remains the most crucial and yet most misunderstood aspect of digital audio.

In answer to your first question, assuming the DAT machine is reasonably well engineered, it should respond very well to an external clock — but note that not all DAT machines can be synchronised to external word clocks. Ideally, the machine should have a word clock input socket (BNC) and the means to select the external clock

referring specifically to the O2R, but to another big-name mixer (from a manufacturer better known for its tape recorders). However, the O2R would still benefit from a high-stability external word clock, particularly if you are planning to work at 20-bit word lengths or greater. There are not many decent word clock generators around, but those I have experience of and can recommend include clocks from Aardvark, Probel and Audio Design.

On the subject of jitter, finally, I fear few manufacturers even know how to measure jitter, or understand its effects. Sadly, therefore, jitter figures are rarely quoted in product specifications. ■

Treated Like Royalties

Publishing rights for TV composers

Isn't it nice to know you're not alone? For some time now I have been meaning to put into writing my concerns regarding the rights of composers in the increasingly cut-throat

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Our regular look at the hottest new sample CDs and CD-ROMs.



Things That Go Bump In The Night

(DOUBLE AUDIO CD/AKAI & SAMPLECELL CD-ROM)

The market for sample CDs full of sounds that are more than a touch 'weird' seems to be growing by the hour, and the latest release to add its own brand of sonic insanity to the melting pot is *Things That Go Bump In The Night* from Big Fish Audio. The cool title gives you some idea of the kind of material presented across the two discs in this double CD release: those hoping to find polite drum loops, soft synth pads or nice orchestral strings, as you might have guessed, should give up now.

The producers seem to have set out with the primary aim of gathering together a number of rhythmic and tonal sound sources (some highly unusual, some more ordinary) then processing, editing, distorting and generally destroying the original signal, leaving only the burnt-out shells of what used to be drum loops, analogue pads, sound effects, and so on.

Disc one takes care of the shorter 'Pitched Loops', brief effects and hits, whilst Disc two concentrates on longer more sustained soundscapes, some lasting as long as 30 seconds. For my money the loops are the most interesting things on the disc, providing tons of eccentric variety as well as good honest levels of funky rhythm

programming. Sometimes it's hard to imagine what gig you would ever get that required you possessing a sound library such as this, while at other times you find yourself lurching for the sampler in a frenzied attempt to get some of the most original and exciting sounds you've heard in ages recorded and into your music ASAP.

As much as anything, *Things That Go Bump* is all about sound design: what it is, how it works and how best to use it. As I've already mentioned, analogue sound sources feature heavily, but seem to be used more as a starting point for drastic experimentation and less as part of the 'We've just bought a TB303 so lets make a sample CD' approach.

'If it moves, distort it' is a battle cry we've heard many times before in the race to come up with ever more weird and wonderful sound libraries, but *Bump* seems to have taken things just that little bit further than the rest. On the down side, and despite the fact that compiling and cataloguing any collection of sounds such as this was never going to be easy, at times you wish that there was a bit more in the way of some accompanying sleeve notes to help you find your way through it all (track names like 'Piggle', 'Snoh' and 'Mogli' are very cool, but they don't tell you very much!).

In terms of value for money this release rates very highly indeed: the large number of usable sounds and the unwavering devotion to all things distorted, twisted, and generally messed-around-with will win it many friends, particularly on the industrial and techno scenes. If you're looking for a fusion between a sample CD, a sound effects library and a very intense trip through some expensive outboard gear that appears to be on fire, check this one out. If, however, you're

looking for something a bit more weird, I suggest you seek professional help... *Paul Farrer*

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Sample And Hold

(AUDIO CD)

Just when you thought the sample CD market couldn't get any more 'analogue', up pops *Sample and Hold*, a 61-track, 73-minute audio CD from sampling veterans AMG. As the name suggests, this release is a study of what can be achieved with a multitude of vintage analogue gear, some serious sound processing and a bit of imagination. With a heavy bias towards the industrial and techno music scenes, the first 10 tracks are taken up with a series of drum and percussion loops ranging from cheesy old beatbox patterns to full rock kits. While the programming and performances of these loops is very good, it's the clever use of some extreme effects (vocoders, flangers, and nasty compression) that keeps the overall sound fresh, but at the same time distinctly 'retro'.

The second section (tracks 12 to 26) contains a collection of 'Synth Sequences' lasting anything between two and eight

bars in length and, like the drum loops, listed with their bpm's. The choice of source instruments is very interesting, with many of the noises so heavily processed and chewed up that it's often hard to tell where they came from. Not that this is in any way a bad thing — indeed, the more experimental the sounds get, the more attitude and power they seem to have.

The masses of bubbling and whizzing synth effects on tracks 27 to 35 are likely to be the kind of thing that will really appeal to hardcore dance programmers, and certainly anyone making radio promos and stings. This collection of short, sharp and fairly intense noises will be cropping up all over the place and deservedly so. The 16 tracks of ambiances describe themselves as 'Cyber Soundscapes' and most are very usable, if perhaps a little unsubtle at times. The whole thing is topped off with eight tracks containing a mixed bag of odd analogue sounds, effects and hits.

Sample and Hold represents a good value-for-money purchase if you are on the lookout for some esoteric analogue effects and grooves with a dark edge to them. However, despite the great sound design and interesting execution of the

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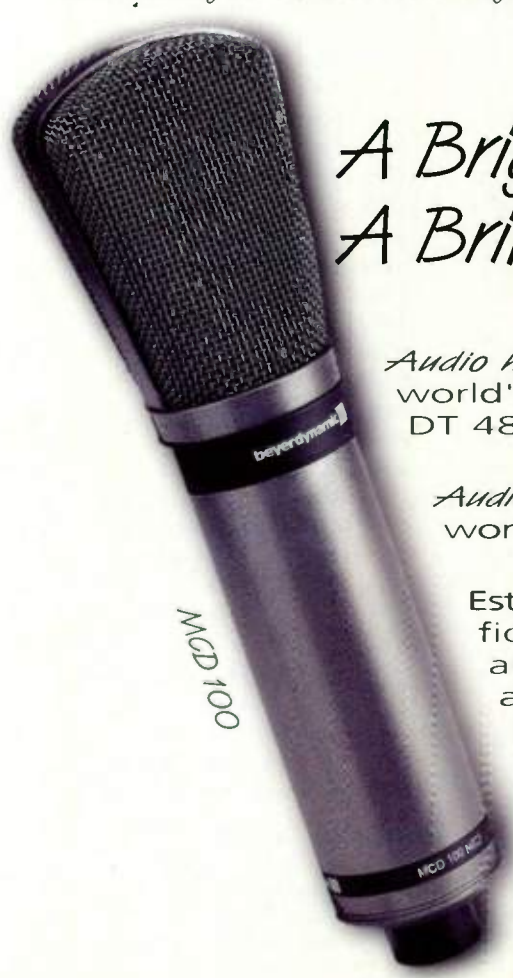
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► release as a whole, I have to say that there isn't much on here that I haven't heard elsewhere before.

Sonically speaking, *Sample and Hold* is a triumph of solid sound design and musical use of effects processors, but in many ways some of the sounds will remind you of what bands like The Prodigy were using on their earliest releases — so perhaps this is the perfect product for those just starting out in the world of industrial or ambient music or, even better... Ladies and Gentlemen, I give you *Sample and Hold* — the first ever '90s retro sample CD! Now there's a thought... *Paul Farrer*

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Twisted City

(AUDIO CD)

This had been playing out in my kitchen stereo for 20 minutes before I felt confident enough to put fingers to keyboard. After an unpleasing demo (the sleeve says 'not for sampling' — a piece of advice with which I can only wholeheartedly concur) I was regaled with a barrage of drum patterns. Not for the faint-eared, these. Was it Punk Jungle meets Half-Speed Garage? I finally settled for 'Thrash Jazz'. It's probably a yooof thing, but I found most of these beats just too big, bashy and boisterous. The patterns I actually could relate to first time around did sound pretty interesting, though. Tempos vary all the way from 60 to 170bpm.

Compression is a feature of most of the loops on offer here, though some compressed/uncompressed pairs were offered too. And when I say compressed, I mean COMPRESSED. Respectable engineers will wince at some of the ratios employed here! This made it hard to decide whether the drums were live, or sequenced, or somewhere in between. At least they never sounded stilted.

Not until a sumptuous stand-up bass suddenly and unexpectedly kicked in was I able to appreciate the full significance of the word 'Twisted' in the title. This contrasted wildly with what had gone before — delicious tonality, excellent transparent engineering, and fresh playing with 'feel' stamped right through it. The stand-up bass was immediately, and apparently illogically, followed by some wild distorted bass effects, then cleaner electric guitar chops. And then came the real surprise...

Tucked right in the middle of this CD is a string section. Not your usual off-the-record cuts, though, nor pads and tones straight out of a Kurzweil, JD800 or Ell either. What you have here is the real thing, as can be found on Peter Siedlaczek's CDs. Not so large a section, perhaps, and recorded dry this time, but just as spine-tinglingly brilliant. Interesting, mysterious, almost clichéd cadences and riffs emanate unexpectedly from the speakers, along with tones and other accessories. Believe me, this is a major work worthy of close attention.

Twisted City isn't the longest sample CD in the history of the genre, but it is one of the very few to be genuinely surprising. In fact each section takes us into strikingly different territory. Those strings! Definitely not one of the many, and possibly not for the many either. But I for one will persevere until I get a tune or two out of it. My guess is that an intelligent and sympathetic blend of the very disparate

elements of this CD (for an object lesson in how *not* to do this, look no further than the demo on track 1) will deliver a spectacular and original piece of music. *Wilf Smarties*

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Funk Stew 2

(DOUBLE AUDIO CD)

Laid-back and funky with tons of attitude seems to be the best way to describe this double audio CD from Big Fish Audio. *Funk Stew 2* presents us with a large number of 'demo songs' complete with drums, bass, guitars, and other instruments lasting anything between 8 and 32 bars, and then gives us all the deconstructed riffs and licks for us to reassemble the 'songs' in any form to suit. You'd be forgiven for thinking that this form of production isn't exactly the height of raw creativity, but the blisteringly good selection of samples and, in particular, the way they are presented within their song forms really encourages you to be much more creative and original than this 'painting by numbers' approach would suggest.

All the performances are perfectly suited to the funk/trip-hop genre, and the choice of instruments ranges from the obvious (drums, bass and sax) to the more original and exciting —

check out the Hammond B3, Nord Lead synth, flute, and vinyl scratch samples. As well as the demo songs, *Funk Stew 2* also provides loads of scope for purely individual sample creativity, with large numbers of guitar licks and chords, bass patterns and some wonderfully smooth and authentic acoustic piano and Rhodes phrases.

Of course, rhythm is the key with any type of funk music, and *Funk Stew 2* provides acres of possibilities in this area as well. Rather than filling up tracks with endless single-hit samples, what you get is loops, loops, and more loops! Obvious care has been taken to try to breathe a bit of life into the drum patterns provided, and on the whole they succeed enormously. Sensible sound processing and editing coupled with totally convincing funk performances makes for thrilling listening and effortless sampling.

If I had to make any criticism it would be that whilst many users find creating a convincing multisample program from an audio CD a tedious and draining experience, many don't, and to tease us with the excellent Nord multisamples but deny us the fun of trying to do the same with the bass, Hammond, sax or flute is a bit of a disappointment. As it stands, though, if you like the Fun Lovin' Criminals, Jamiroquai or any other cutting-edge retro hip-hop funk band, with *Funk Stew 2* you'll be sounding like your idols in a matter of moments. Compared to East West's wonderful *Smoov Grooves* (the most comparable sample CD product) *Funk Stew 2* seems to have the slight edge, if only for the fact that it contains more actual sample material and so can cover a much wider range of musical styles. *Funk Stew 2* is a real winner. As the Rottweiler on the front cover says, it all tastes Sooo Damn Funky. *Paul Farrer*

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Paul Nagle takes the helm this month in our new regular feature on music and recording resources on the Internet, highlighting sites devoted to synthesizers old and new, and finding an essential download for owners of the Roland VS880.

For me, one of the most useful aspects of the Internet is the ability to turn up information on older synthesizers. Perhaps you've spotted an apparent bargain in the *SOS* classifieds but want to find out exactly what it has to offer. A good collection of scanned synthesizer photos is stored at the SynthFool site, www.synthfool.com, which has some real rarities and stuff I've personally never seen 'in the flesh'. Indeed, most of the pictures show synths you'd be very lucky to find, so it's a shame that some of these photos aren't displayed at better resolution. Nevertheless, if you want a tantalising glimpse of the Aries Modular, Buchla's 200 Series, PPG, Digisound or Emu modulars and, of course, Moog modulars, this is the place to go. Of more practical benefit, some of the scanned brochures for old synths are just the thing if you're unsure what that second-hand discovery actually is. Assorted scanned schematic diagrams, a section on Roland Service Bulletins (plus the Initialisation Procedures for various Roland synths and drum machines) all add up to a site you should bookmark.

With both old and new instruments represented, the Vintage Synth Explorer site at www.pacificnet.net/~hypno/vs is another goody. Noteworthy are its Real Audio samples of many of the instruments and its image archive, which complements the photos at the SynthFool site. In a similar vein, take time to wander round the Virtual Synth Museum (www.synthmuseum.com) — although again, some of their scans aren't of the best quality.

There's lots of info, including details on the production dates and even statistics on the numbers of particular models produced, although it's not certain how accurate these figures are.

Tried And Tested

If you want to check out what synth owners say about their instruments, check www.sonicstate.com/synth/test.html for user reviews. It's good to see contrasting opinions about the same synth which might help you to spot the strengths and weaknesses of a particular model — or they might leave you more confused than before. This being the Internet, you can contribute your own review here too, spreading your experiences, discoveries, and opinions to the world.

Having looked at assorted synths from around the world, it's good to see a venerable British synth manufacturer still going strong and represented by a great web page. EMS, makers of the VCS3 and Synthi A are alive and kicking. For those who share my fascination for bizarre-looking synths, EMS have scanned a considerable number of their prototypes which never made it to the real world. There are instruments that look like they wouldn't be out of place in Dr Who's TARDIS, and I for one would love to get my hands on some of them — especially that groovy-looking VCS4! There are some items of real historical significance here, which you just know would delight the anorak brigade if only you could obtain one to pose with on stage. Mosey along to www.hinton.demon.co.uk/ems/ems.html if



Left: The Vintage Synth Explorer site allows you not only to look at and read about those classic analogue synths, but also to hear them via Real Audio downloads.

Right: For those who like nothing better than gazing at scanned pictures, brochures and manuals for old synths, the SynthFool site is a godsend.



such things appeal to you.

Hinton Instruments also hold some online reference material, which includes a list of manufacturers' SysEx identifiers (along with links to many of their web sites) at www.hinton.demon.co.uk/midicode.html, and there's a section on delays in MIDI systems. This should prove an eye-opener to those penny-pinching manufacturers who believe they can get away with omitting a hardware thru on some (not necessarily budget) modern instruments. Read this stuff (at www.hinton.demon.co.uk/hintmidi.html) and never accept a software-switchable thru/out again. If you're handy with a soldering iron, there is considerable data on the modification of the VCS3 and Synth A/AKS, along with the intriguing claim that "Nobody that was ever really serious about these instruments left them unmodified". The modifications are listed under three categories: essential, recommended and optional, and should be required reading for any EMS synth owner.

Waves Of Pleasure

Perhaps the best set of general synthesizer links can be found at Synth Zone (www.synthzone.com) which

should point the way to practically any current synth, effect or music software. It's worth remembering that not all 'vintage' synths are analogue; the PPG Wave and Wavetern synths offered their own particular brand of strangeness for many years and www.nashville.net/~antarct/ppg.htm has details of PPG synths, plus contact lists for PPG users throughout the world. If your PPG has a fault or requires a modification, this is a great place to seek help.

Lovers of the Korg MS series of synths can find some useful online resources at 209.3.65.147/ben/korgms/korgms.html, including complete online manuals, tips and techniques which include revelations about controlling a Korg MS20 from an Octave/Volt keyboard or MIDI/CV converter, which I'd love to try out if I still had mine. Also at this site is material about Korg's monster PS series of synths, and a helpful series of links to many other Korg pages.

No synth-loving surfer's travels should exclude Harmony Central (www.harmony-central.com). This site contains a great number of online articles, on topics ranging from intimidating, complex explanations of wavetable and FM synthesis to

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► more easily-understood texts on physical modelling, complete with audio examples. It's worth visiting often just for the news section; in fact it was here that I recently spotted a reference to the new Nord Modular software upgrade, (2.1) which should be available from November and features some great new modules including (at last) a ring modulator, key quantiser, digitiser, a vocal filter (with a control input so you can change smoothly between one vowel sound and another) and more. These, added to the vocoder, compressor, phaser and many other modules of version 2.0 almost amount to a new synthesizer, available free to Nord Modular owners as a simple download from Clavia's site (www.clavia.se/nordmodular). While you're there, grab some of the hundreds of free patches created by Nord owners around the world which demonstrate the power of this amazing modular synth.

Harmony Central isn't just for synth-heads — there's also a great effects unit database and various excellent articles. One of my favourites, at www.harmony-central.com/Effects/Articles/Compression, deals with exactly how compressors work and what you can do with them. Harmony Central also has links to some of the more synth-related newsgroups which are useful forums for buying and selling synths, or just for asking 900 people you never met to recommend what synth you need to make techno... Possibly more useful is the online Synth Database which, like the Sonic State site, holds 'user comments' on a large number of instruments, with the facility to

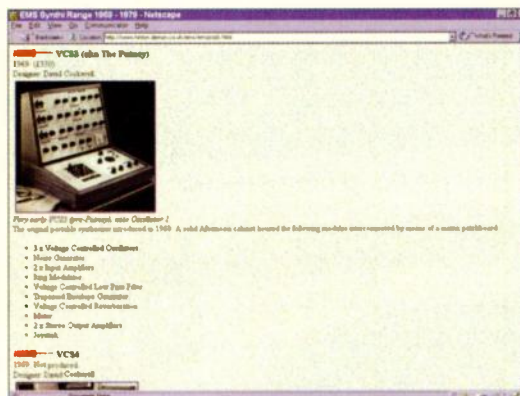
add your own opinions too.

The MIDI Farm is another large site, at www.midifarm.com, which I visit for online reference on MIDI Messages, the MIDI spec, SysEx etc. There's a wealth of information at www.midifarm.com/info/frameglat.htm which covers in detail topics such as the Sample Dump Standard, the MIDI Specification, MIDI Time Code, and subtopics like "What's Active Sensing?". This is really well-written, and worth downloading and reading through even if you're already convinced you know everything there is to know about MIDI.

Saucy Stuff

It seems that I'm not alone in my fetish for pictures of synthesizers as the Microwave 'erotic photos' site demonstrates. Yes, incredibly, a proud Microwave owner has taken his synth into the countryside of Japan and persuaded the shy young thing to be photographed in various poses (which never stray from the tasteful). And they say the English are eccentric! Check out 210.167.212.35/pictures/MWXT/MWXT_gallery.html if you're that way inclined.

There's more serious Microwave stuff at Waldorf's own web site, www.waldorf-gmbh.de, including the latest Microwave 2/XT upgrade — version 2.14 as I write this. This upgrade adds three new filter types (two notch filters and a band-stop filter) to the Microwave's already impressive arsenal. Whilst at Waldorf's site, you might care to take a look at the specs and images of the forthcoming Q synthesizer, or check out the Microwave PC, a hardware add-on for the Terratec EWS64 soundcard which



The EMS site is full of information not only on that company's production models, but also their experimental prototypes.

is possibly the cheapest legal way to acquire a Microwave. Not only do Waldorf make cool synths, but they have a degree of personal accessibility which is all too rare. Their web page gives details on joining the Waldorf users' mailing list — an email-based forum where Waldorfers can swap tips for Waldorf products, suggest desirable new features, and perhaps even get an idea incorporated into a product update. The Waldorf guys actively participate and are keen to discuss the synths that they obviously feel are their 'babies'. Contrast this with the approach of most larger organisations, whose only interest is in selling the current model and who rarely, if ever, add free enhancements to existing stuff they've already sold.

VS880 Resources

In direct contradiction to what I just said, I must mention that one large company, Roland, had a great add-on for owners of the Roland VS880 hard disk recorder at their web site (www.rolandus.com/SUPPORT/SOFTWARE/SOFT_IND.HTM). Version 3.1 of the VS880 operating system finally offers the ability to back up song data to CDR, and is a free download. For me, this instantly bumps up the desirability of the VS CD-writing system (this backup function was absent when I reviewed it), to the extent that it has probably put an end to my own dithering over which CD writer to buy. A final addition Roland could make to convince other waverers would be to add the facility to back up the CD image files too, greatly reducing the time it takes to make multiple CD copies.

There are many other handy VS880 resources on the Internet, including the VS880-based sequencer from Australian company Datasonics (www.datasonics.com.au). This program (*Music Master VS*) allows you to perform onscreen cut, copy and paste operations with the VS880's wave data, as well as providing virtual consoles for instant control with no need to even touch the VS. Better still, multiple VSs can be controlled, so if you want to run MIDI on your PC but keep audio firmly away from your PC soundcard, this is a great way to go.

Other VS resources are linked from www.virtualstudio.org/Heber/vs880.html and include answers to Frequently Asked Questions, diagnostics and software utilities — and the MIDI spec, which is a real boon if you want to create mixer maps or other control software for this excellent recorder. There's also an email-based mailing list where users can swap VS tips, although if you subscribe, prepare for a big increase in your incoming mail, not all of which is directly related to the VS. The Internet is a great source of information but it's also a place where people feel driven to pass on their opinions, thoughts and prejudices on any topic that they like, often at great length. In fact, oddly enough, I've done exactly that and haven't left myself room to enthuse about my favourite music shareware sites, as I had planned — this will have to wait for another month. In the meantime, you could do a lot worse than surf to the Shareware Music Machine at www.hitsquad.com/smm. Happy clicking! ☺

Back To Basics

All this heady stuff might be a little intimidating — but thankfully, there are plenty of suitable starting points for beginners. A good place to begin is tilt.largo.fl.us/faq/synthfaq.html, which covers everything from "What is a synthesizer?" to explanations of terms such as multitimbrality, analogue synths, digital synths, modular synths, drum machines and samplers. Everything you were probably afraid to ask is set down here clearly and simply for you to read in the comfort of your own home. You want to know about vector synthesis, FM, granular synthesis? Well, pretty much everything gets a mention, but nowhere does it try to blind you with science.

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Waldorf D Pole	£149.00	Wavlab Plug Ins	£289.00	Cubase Plug Ins from	£119.00
Waves	£125.00	Native Power pk	£379.00	Sound Forge XFX 1-3	£ 99.00
Acoustics Modeler	£199.00	DSP Bundle PC	£739.00	DART	£ 49.00

Audio & Music

AudioEdit Pro is fast becoming one of the most respected audio editing packages for the PC, with superb noise reduction and fantastic real time preview of most effects it is truly stunning. It even has a 30 band graphic eq with real time preview! A truly powerful package. Sound Forge too is hear along with Wavelab and XG Edit, Gary Gregson's superb XG Editor.

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XG Edit Registration	£ 25.00	ACID	£249.00	Recycle PC/Mac	£179.00

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design - Media Tools specified and built dual 48 track digital mobile system, with continuous recording ability, mic amps, limiters, and footswitchable monitoring. All racks brought out to 96 pin DL connectors.

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digidesign Total Control



Pro Control is a tactile control surface offering full access via ethernet to all edit and mix parameters within the ProTools software. 8 channel Fader Expansion Packs allow access of up to 32 moving fader strips at a time.

PROCONTROL

ProTools Plug-ins

£490

Wave Mechanics Pure Pitch

Realtime formant preserving pitch-shifting plug-in that controls vocal characteristics. £576 inc vat.

£699

Intelligent Devices IQ

Leans EQ characteristics which can then be applied to any other audio. £821 inc vat.

£424

Intelligent Devices AD-1

A comprehensive real-time monitoring tool with spectrum analysis, phase scope. £499 inc vat.

£659

Syncro Art Vocal Align

Automatically edits one audio signal to match another for lip-sync, backing vocals or fx. £774 inc vat.

£599

Lexicon Lexiverb

4 classic Lexicon reverb algorithms with up to 100 programs. £703 inc vat.

£449

Antares AutoTune

Corrects errors in the intonation of voice or solo instruments. £527 inc vat.

£399

Aphex Aural Exciter

Utilises the Type II technology recreating & restoring the missing harmonics in a sound. £468 inc vat.



£299

Digidesign D-Fi

Add noise, distortion and tape warp simulation. A must for that retro sound. £351 inc vat.

£1139

Dolby Surround Tools Bundle

Produce Dolby Surround mixes within the ProTools and preview the results. £1338 inc vat.

£459

Drawer Dynamics

Like D520 DL421/251 brings frequency conscious noise gate, expansion & ultra smooth compression. £539 inc vat.

£1139

Focusrite D2 & D3 Bundle

The famous Red series eq and compressor/limiter. £1338 inc vat.

£260

GRM Tools Vol. 1 & 2

Amazing algorithms developed from government defence work. £308 inc vat.

£594

TC Master X

The ultimate mastering tool for TDM featuring integrated multiband expansion, compression & limiting. £698 inc vat.

£459

Line 6 Amp Farm

Emulates classic guitar tube amps from a Fender Twin, Marshall JCM800 to Vox AC30. £539 inc vat.

£680

WavesTDM Bundle

Over 11 in their range including the new Renaissance compressor. £799 inc vat.



Avid McXpress NT Digital Video Editing

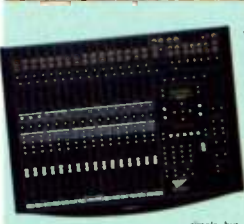


Avid Entry Edit Solution
 • New Premium 2000MHz Celeron & 4GB RAM, Windows NT 4.0 & 17" Trinitron Display
 • Avid MCXpress NT software
 • Targis TruVision 1000 card
 • Sony DV Camera & Screen

Avid Real Time FX Solution
 • Intel P4 3000MHz Celeron Processor & 2GB RAM
 • Windows NT 4.0 & 17" Trinitron Display
 • Avid MCXpress NT software
 • Targis TruVision 1000 card
 • Sony Professional DV Camera & Screen

The industry leader in digital picture editing, Avid is a name that has become synonymous with video and film. The MCXpress system for Windows NT brings broadcast picture editing with support for professional realtime fx plug-ins. Systems can be configured to suit your budget, please call for more details.

SPIRIT DIGITAL 328 Digital Mixing Console



With the new Spirit Digital 328 console not only do you get 32 channels each with moving faders, 3 band fully parametric EQ, 6 aux sends and total automation, but there's also 2 built in Lexicon effects processors, 2 high quality DBX dynamics units, 16 channels of ADAT & TDF i/o (no need for extra cards), and on top of all this the desk has 24 bit converters with 56bit internal processing. The design of the console has benefited from other previous digital desks with Soundcraft's simple but superb Estrip providing control for all of its channels functions, so operation couldn't be simpler.

£2999.99
 £3523 INC VAT

QUESTED F11 Self Powered Monitor



the spectral balance is well-judged and bottom end surprisingly articulate - amongst the best I have heard from nearfields.
 "A high quality reference design that should become an industry standard"
 SOS Review Nov 1998

£979
 £1150 INC VAT

VS2205 Self Powered Monitor

The VS2205 is a highly accurate reference monitor, low profile and shielding made it ideal for a wide variety of uses. Built in amps separately drive two 130mm bass units and a 28mm ferrofluid damped soft dome tweeter. Switches are provided for input sensitivity and HF and LF equalisation, to compensate for room conditions and listening.



£1445
 £1697 INC VAT

SOUNDSCAPE V2.0 PC Audio Hard Disk System

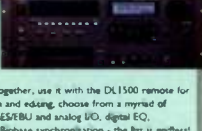


V2 is a brand new 32bit native version with new software and control of the new DSP features. The new upgrade includes the SSAC-1 Accelerator Card which increases the number of playback tracks to 12 per unit. The original 2 input 4 output configuration can have an additional 8 in/out TDF/ADAT port. Each software mixer channel can have any number of real-time processors (EQ, Compression, Reverb) limited only by the available DSP processing power.

FROM
 £1699
 £1999 INC VAT

AKAI DD8 HD Multi-Track Recorder

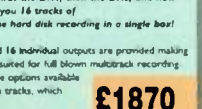
DD8's new 17" Full HD monitor plays back 8 tracks at a time directly onto high resolution, 24 bit magenta colour carts. There is really no lengthy backup at the end of a session, or reload at the beginning (of course you can still make a safety copy if you wish too). Sync multiple machines together, use it with the DL1500 remote for DD1500 style SuperView operation and editing, choose from a myriad of expansion options: TDF, ADAT, AES/EBU and analog I/O, digital EQ, Ethernet, SMPTE, MIDI, 9 PIN and Biphase synchronisation - the list is endless!



£2725
 £3201 INC VAT

DR-16 HD Multi-Track Recorder

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



£1870
 £2199 INC VAT

TASCAM TM-D8000 Digital 8 Bus Console



Combining a very elegant user interface with great sounding analogue and digital i/os, the TDM8000 40 input/8bus console includes full-function machine control section for a variety of industry standard protocols, plus surround sound 5.1 channel panning. The analog inputs can be switched to take TDF, AES/EBU or SPDIF signals in a variety of channel configurations making it very versatile, needing no additional plug-in cards to accommodate the different formats. 24 long and short throw faders, an integrated fully featured meterbridge and 6 aux send/returns to name just some of the features makes this a welcome addition to the range of low-cost digital consoles.

£5995
 £7044 INC VAT

and More...



Launched at the September AES show Digidesign's **Pro Tools 24 Mix** and **24 Mix Plus** systems now give you all the capabilities of the Pro Tools 24, but with more tracks, and more DSP power.



The Pro Tools 24 Mix is a single-card system with up to 3 times more DSP power than Pro Tools 24 and up to 64 tracks. The 24 Mix Plus has an additional Mix Farm card providing double the DSP power of the 24 Mix system and comes with TC Electronics new MegaReverb effects Plug-In. New MultiShell technology also allows Plug-Ins to share the same DSP chip. Now available on both Macintosh and Windows NT platforms.

RORKE DATA 2 bay AVR 19" rack with "hot swap" hard disk canisters. The only storage solutions for hard disk recording with drive cases to suit all media & 48hr swap out policy.

ProTools Packages

Here at MediaTools we have over 10 years experience with Apple and audio from the Apple lie up to the current Power Macintosh G3 computer. Systems can be configured and installed to suit your use, with any choice of Macintosh compatible software, interfaces and drive media.

Apple Authorised Reseller

Project Studio 24 bit Card

- Connects to both Digidesign's 882/20 or ADAT Bridge interfaces
- Supports up to 16 I/O & 32 tracks of audio
- Cubase VST & Emagic Platinum sequencing/audio software compatibility



RRP £525.99
INC VAT £615

Audio Edit & Sound Design

- Apple Macintosh G3/266 64/4000CD & Design Keyboard
- Formac 17" Multisync Display
- AudioMedia III Toolbox Bundle Inc. ProTools, D-ix, D-I & Bias Peak LE

TOOLBOX PACKAGE 1
£1899
INC VAT £2230

24 bit & 32 track recording

- Apple Macintosh G3/266 64/4000CD & Design Key'd
- Formac 17" Multisync Display
- ProTools 24 Core Core System
- Digidesign ADAT Bridge or 882/20 Interface
- External 4Gb Barracuda Hard Drive
- PCI SCSI Accelerator

PROTOOLS 24 PACKAGE 2
£5899
INC VAT £6930

24 bit & 64 track recording

- Apple G3/300MHz 128 / 6000 CD, ZIP & Extended Key'd
- Formac 20" Multisync Display
- ProTools 24 Mix Plus System
- Digidesign 882/24 Interface
- PCI SCSI Accelerator
- 2 x 9 Gb Fast & Wide Hard Drives
- TC Electronics MegaReverb Plug-In

PROTOOLS 24 MIX PLUS PACKAGE 3
£POA
FREE DIGI-INS OFFER UNTIL DEC

SONICWORX Advanced Audio DSP & Rendering Software

Artist 1.5 is aimed at sound designing for film and includes Sound Morphing (Complex, Exponential, Linear & Structural), an 18 band Vocoder with HF/Noise synthesizer, De-Reverbator, Time-Compression Expansion Pitch Designer & Drum Loop Juggler.

£211
INC VAT £249

The **Studio 2.0** software contains tools for post-processing/mastering including real-time DSP (EQ, 31 band Analyser & Multi-band Compressor, Vinyl Phase Alignment & Umicast Headroom Switch), Neural De-Clicking, De-Cracking & De-Noising. New Version 2.0 will take additional real-time plug-ins.

£424
INC VAT £4999

New **Pandora Real-Time** Plug-in for Studio 2.0 has to be heard to be believed. This software allows level adjustment and removal of a vocal in a stereo mix!

NEW

ALESIS M20 20 bit digital recorder

The M20 is Alesis' new Professional 20 Bit Digital Audio Recorder. Housed in a rugged 4u case and built for demanding, long hour use with a full-servo direct-drive transport, and true 20-bit capability (with dithering to 16bit). It has built-in SMPTE/EBU read/write time code track and full compatibility with all other 16 bit ADAT models, automatically differentiating between Type I and Type II tapes. Analogue 56-pin ELCO and XLR connectors with digital ADAT optical/sync interfaces plus video reference, word clock, time code and MIDI as standard - no external cards or boxes needed. The optional CADI Controller/Autolocator and the Remote Meter Display are also available.

£4999
INC VAT £4255

See our events timetable for details on our London clinic.

YAMAHA PROMIX 01V Digital Mixer

Replacement for the ProMix 01, with 16 analogue inputs plus 8 digital ins and outs via optional cards in either ADAT, 20 or AES/EBU format. 4 band parametrics for all the main inputs, 2 stereo multi effects processors, moving faders, & dynamic MIDI automation.

£1190.99
INC VAT £1399

Built in surround sound mixing, motorised faders with 26-inputs & 18-output console features fast 32-bit internal digital audio processing, versatile analog and digital I/O configuration, new 33-bit onboard multi-effects processors with freeze (sampling) and guitar amp simulation effects, fader and mute grouping, onboard automation, & MIDI remote capabilities.

O3D Digital Console
£1648
INC VAT £1936

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

O2R Digital Console
£4599
INC VAT £5403

T.C. ELECTRONIC UNITY Effects Processor Card for O2R

ATTENTION O2R OWNERS - TC's M2000 effects processor now available on a card for your O2R, starting multi-effects processing with free O2R V2 software and optional digital I/O along with the convenience of Yamaha's recall & automation system. Don't buy an AES card or version 2 software for your O2R before a demo on the TC Unity card.

£739
INC VAT £868

The Fireworx has broken the mould of previous studio multi effects by offering processing such as Formant Filters, Distortion, Vocoder, Ring Modulation and even a monophony as well as dynamics and the usual time delay effects. With 24 bit A/D & D/A converters, AES/EBU & SPDIF digital I/O and ADAT Toslink connectors the Fireworx can add an extra dimension of effects to any studio.

FIREWORX Effects Processor
£1449
INC VAT £1699

Professional quality mastering tools at a project studio budget: 5 band EQ, De-esser, Digital Radiance Generator™, Normalizer, and three band Dynamics, all with precise editing and the option to use TC's Wizard to do the work for you by analysing the program material automatically. The new Finalizer 2 has 24 bit analogue and digital I/O, ADAT I/O, call us for a demo - this product is guaranteed to improve your master!

FINALIZER 2 Mastering Processor
£1749
INC VAT £2049

FOCUSRITE PLATINUM New Outboard Range

The VoiceMaster is an all in one recording console, M and line level inputs, with expandable, saturation circuit, for wah-like tones, opto-compressor, parametric EQ and opto de-esser.

£322
INC VAT £379

The ToneFactory has instrument, mic and line level inputs with filters and opto-compressor. The Tone Controller section has guitar amp style EQ controls with Overdrive control and brightness switch, along 2 bands of parametric EQ and noise gate.

£379
INC VAT

TRAX DATA CDR SCSI CD Recorder Range

The ultimate in desktop CD duplication, TraxData provide a range of solutions to suit any budget, from the TraxCopier pictured here, capable of duplicating 150 CD's of varied formats in one session to computer based systems more suited to project studios.

FROM £359
INC VAT £423

Call for details on a system tailored to your requirements

WALDORF WAVE Wavetable Synthesizer

Arguably the best synthesiser owned by names such as Han Zimmer, Björk, The Orb, Peca Townsend, Letfield, Faithless and many more. Call for a demo.

£5399
INC VAT £6343

AKAI S6000 Sampler

The new 'flagship' sampler offers the above with a detachable front panel display/control unit. The main case houses up to 256MB of RAM and 128 voice polyphony and an optional 1GB las drive provides archiving. The data can be saved in RAM ROM and in addition the S6000 has dual SCSI ports. A QWERTY keyboard can even be plugged in to ease naming. With BPM matching, timestretching, pitch shifting and all the other high quality features you would expect. This is the Akai sampler you've been waiting for!

RRP £2385

0171 692 6611

Ref.	Inc. VAT	Ref.	Inc. VAT
Sonyi Spirit Studio 24 Adat	£1369	£1900	
Seimensat Spirit Studio 32ch	£1620	£1904	
Seimensat Chest 24 Adat	£2288	£2700	
Kraig 168RC	£999	£799	
Mitsub 24.8	£1787	£2100	
Yamaha 02R	£3999	£4899	
Yamaha 03D	£1999	£2399	
Behringer Eurorack 26.4 mixer	£298	£350	
Tecam DAB	£2129	£2652	
Alteck A81	£799	£999	
Alteck Acti LX20	£1020	£1199	
Fostex C88	£999	£999	
Fostex D160	£1999	£2399	
Fostex D90	£1025	£1204	
Fostex D15	£1870	£2187	
Scm PCM 900	£1499	£1781	
Panasonic SV300	£629	£759	
Fostex DS	£450	£529	
Sony PCM 9800	£799	£959	
Tecam DAP1	£725	£852	
Tecam DA60 MA2	£2975	£3684	
Tecam DA30 MA2	£790	£960	
DOG USA	£127	£149	
Digitech Studio Vocalist	£590	£693	
Digitech Vocalist Performer	£245	£288	
RHund SHV30	£329	£387	
Jociflex VCD	£127	£148	
SPL Wilmager	£196	£239	
TC Reverbizer	£1275	£1590	
Digitech Studio Quad 4ch Fx	£213	£250	
Focamite Dual Mic Preamp	£340	£410	
Focamite EQ Parametric EQ	£340	£410	
Billmeyer Dual Tube Compressor	£419	£492	
Billmeyer Dual Tube Di Box	£109	£128	
Billmeyer Tube Mic Preamp	£139	£163	
Urecon MPX1	£499	£598	
Urecon PCM20	£1168	£1372	
Urecon PCM90	£1445	£1698	
BSE 482 Sonic Masterizer	£170	£200	
BSE 862 Sincic Masterizer	£212	£249	
Anek 9058CL Comolator	£1099	£1291	
Aphel C2 Exclive	£138	£1570	
Behringer Compressor	£127	£149	
Yamaha A3100	£999	£1199	
Yamaha 6400 + 64MB	£1531	£1799	
Alexi CD-ROM	£1105	£1298	
Akai S3200XL + 32MB	£1403	£1649	
Akai MP-C1000	£850	£999	
Genelec Monitor 10.0	£290	£341	
Roswell K5800	£510	£599	
AKAI MPC1000	£999	£1199	
Novation Octatrack	£578	£677	
Blattner Auring Playstation	£383	£450	
Korg 1212 HQ	£997	£1199	
Emagic RealTime II	£999	£1199	
Cambridge Dpp1 Pitch Plug In	£99	£119	
Digidesign P7000 Power Mix	£229	£299	
Aesha RA100	£152	£179	
Comem 100A	£592	£699	
Sammey Servo 170	£185	£199	
Barnett Servo 550	£254	£299	
Coufferaff Allmusic Zero	£161	£199	
Tannoy PM3	£99	£119	
JBL Control 5 Monitor	£199	£239	
Altec Monitor 2 (pair)	£289	£359	
Akrap Point 7 monitors	£144	£169	
Beyo M300	£42	£49	
Argemwin GR3A	£212	£249	
Citron M212	£127	£149	
AKG C61	£107	£128	
AKG D3500	£97	£99	
AKG D880S	£59	£69	
AKG C414	£108	£129	
AKG C418	£448	£528	
AKG C12	£127	£149	
AKG C812	£161	£189	
AKG D112	£144	£169	
Audio Technica AT1433 + Shack	£229	£289	
AutoTech ATM73A	£25	£29	
Rolle NT1	£149	£175	
Thure Sat57	£72	£85	
Thure SP158	£71	£80	

media tools

Chugai Boyeki CD Duplicator



£3,495
ex VAT

The Chugai Boyeki Computer ALW501 Automatic Duplicator is able to duplicate between one and fifty CDs in a single operation and will also recognise new masters to allow multiple duplication of multiple master CDs, all in the same operation.

A unique combination of reliable robotics allied to recognised technology brings the opportunity for anyone to make CDs in batches with a minimum of effort. No special skills are required as the software supplied loads easily. Dust proof doors offer reduced error possibility and combine with fail safe checking, verify and sorting, to ensure that any incomplete transfer of information is automatically recognised and rogue CDs moved to the reject tray, all without interruption of the production cycle or your working day.

Computer ALW501 - Standalone Automatic CD-Duplicator (50 CD-Rs) £3,495+

CD-Rs, CD-RWs and DVD-Rs big brand names, best prices

TDK CDR-74 Reflex Branded (price each)	120 off - £1.07	call for quantity prices
Philips CDR-74 Branded (price each)	100 off - £1.09	call for quantity prices
Philips CDR-74 8x Branded (price each)	100 off - £1.11	call for quantity prices
Philips CDR-74 8x White Printable (price each)	100 off - £1.29	call for quantity prices
Philips Consumer Audio CDR-74 (price each)	100 off - £1.64	call for quantity prices
Kodak CDR-74 Branded (price each)	120 off - £0.97	call for quantity prices
Unbranded CDR-74 8x (price each)	100 off - £0.74	call for quantity prices
Rimax CDR-80 Branded (price each)	100 off - £0.78	call for quantity prices
TDK CDRW-74 Reflex Branded (price each)	10 off - £7.33	call for quantity prices
Philips CDRW-74 Branded (price each)	10 off - £5.91	call for quantity prices
TDK DVD-R 3.95GB Branded (price each)	10 off - £36.00	call for quantity prices

CD Revolution Duplicators with Padus DiskJuggler



from £2,962
ex VAT

The CD Revolution CDR Duplicator is a powerful and attractively priced Intel Pentium based PC system which incorporates both fast and efficient 4x 12x CD Recorders combined with the power of Padus DiscJuggler CDR duplication software. DiscJuggler supports both Windows 95 and NT of which NT is installed on the CD Revolution CDR Duplicator.

DiscJuggler features provide a comprehensive set of compact disc duplication functions and a simple, straightforward user interface. The CD duplication features of DiscJuggler

make duplication of any existing Compact Disc fast, easy and reliable.

Whether the source is an off the shelf audio compact disc, a mixed mode CDROM, a backup disc, or a video game CD, all one needs is the CD Revolution PC based CDR duplicator with Padus DiscJuggler.

System Specification

- Choice of the latest CD-ROM drive: either 24x or optional extra 17" rack mounted unit
- 333 MHz Intel Pentium Processor II, PC Baby AT Format K26140 PII Netherlands
- 12MB 100 EMM expandable to 128MB
- 4.5GB fast SCSI HDD - 3.5" 1.44MB floppy
- Pioneer 52x MultiRead SCSI CDRW drive with true digital audio extraction
- 7, 14 or 20 off 4x 12x CD Recorders
- Adaptive 2940 SCSI card for 4 CD Recorders
- Adaptive 2940 SCSI card for HDD / CDROM
- Microsoft Windows NT4 Workstation
- 2MB Graphics Card
- 15" Colour Monitor
- Professional Keyboard and MS Erg. Mouse

CDR Duplicator (lockable) with 7 off 4x 12x CD Recorder	£4,295+
CDR Duplicator (lockable) with 14 off 4x 12x CD Recorder	£6,464+
CDR Duplicator (lockable) with 20 off 4x 12x CD Recorder	£8,634+



Vulcano CD Duplicator



from £2,152
ex VAT

Vulcano MultiCD Standalone 4-Drive and 8-Drive Standalone CD Duplicator

The MultiCD is a CD replication unit ideal for anyone who has to distribute their personal data bases, who might have to make short or medium runs of a particular software, for music groups that may want to make a limited version of a compact disc, etc. Thanks to its low cost and its great versatility, the number of applications for a unit of these characteristics are almost unlimited.

Duplication with the MultiCD is completely digital, this means that there are no originals and no copies. The CD originated by the MultiCD is completely identical to the one used as source. MultiCD advantages: Allows the updating and enlargement of the unit without changing the hardware. It works in a completely autonomous way, it doesn't have to be connected to a PC. It can be optionally connected to a PC via SCSI in slave mode and be used as a completely normal external CDW unit. Stability of speed in all models up to a total of 32 CDs/hour.

CopyTrax CD-pRinters

The CopyTrax CD-pRinter is a low cost inkjet printer based on popular Epson models and provides sharp laser quality colour to CD-R / CD-RW and paper printing, providing a perfect solution for personal and business use.

call for free print sample

It is the ideal printer to provide brilliant 24bit colour 720dpi results for in-house CD-R reproductions, desktop publishing, presentation graphics and other business and personal documents.



From £385
ex VAT

CopyTrax Matisse Gold CD-pRinter - 720 dpi (mono), 360 dpi (col)	£385+
CopyTrax Da Vinci CD-pRinter - 1440 dpi (mono), 720 dpi (col)	£665+

CD Revolution DVD-Video Professional Authoring System

The CD Revolution DVD-Authoring System is a 450MHz Intel Pentium II Processor based NT Workstation used to author short length DVD-Videos on low cost CD-Rs using an integral CD-Recorder AND full length DVD-Videos which can be produced using an optional Pioneer DVD-R recorder or DLT tape, (used for pre-mastering factory pressed DVD-Videos). The software can be upgraded to provide the full features of the DVD Standards such multi-viewing angle, etc

from £12,902
ex VAT

NEW



Liquid Audio - Liquifier Pro



£265
ex VAT

Liquid Audio is probably the ultimate Windows 95/98 software innovation that combines the power of the Internet as a secure delivery system for high CD quality music with that of the CD audio recording capability of popular CD recorders. Whether you are a new and up & coming pop group, a well established artist or recording studio, Liquifier Pro 3.0 for Windows 95/98 is your gateway access to a Liquid Audio based Service Provider who will host your music and collect royalty payments on your behalf as you so determine with music being sold on a track-by-track or as a complete album.



CD Revolution Ltd

Importers & Distributors of CD Recording, DVD & allied products

Loddon Business Centre, Roentgen Road, Daneshill, Basingstoke, Hants RG24 8NG

Tel: 01256 400 000 Fax: 01256 476 182 <http://cdrevolution.com>

TRADE ENQUIRIES WELCOME

As it was, as it is, and as it may be. **Martin Russ** looks ahead to where musical Macs may be going.

I'm embarrassed to admit that I can remember a time when the sound output from a computer consisted only of a beep when you pressed the 'Control' and the 'G' keys simultaneously! Since then, things have improved ever so slightly. When the Macintosh was first launched, its sound capabilities were relatively advanced — square waves, a wavetable 'synthesizer' and a 'four-tone synthesizer'. It's worth noting that in the mid '80s, the ability to produce four simultaneous notes using 8-bit values in a 256-cell array would occupy about half of the processing power of a Mac 128K or 512K. (For completists, the Lisa and the Mac XL had only the square waves!)

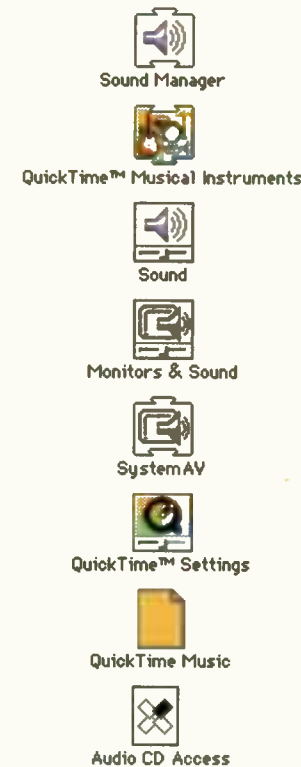
Armed with sound-generating power like that, the early Macs were rapidly encumbered with a number of interesting sound-related distractions — replacing the simple 'beep' alert sound with something more interesting (and you had up to 5,000 8-bit, 256-point wavetables to play with) or even producing four-part music via *Musicworks*. My personal favourite was the little accessory which produced a typewriter click every time you pressed a key, with the return key

producing a satisfying whirr and clunk. It was fun for about 30 seconds — and then you turned it off forever.

On the MIDI side, single-port MIDI interfaces were able to control rather more seriously professional music. Names of today like Mark of the Unicorn (*SOS* Volume 2 Issue 1) and Opcode cut their teeth in this era, whilst companies like Southworth Music Systems (*SOS* Volume 1 Issue 9) vanished into obscurity. In the States, the Mac continued being the MIDI musician's computer of choice via names like Digidesign, but Europe went with the Atari ST instead, eventually leading to the Steinberg and Emagic musical powerhouses of today — on both the PC and the Macintosh!

Sound Manager

Apple's System 6 introduced the Sound Manager, an evolution of the earlier Sound Driver with considerably enhanced features. AIF files appeared, along with the square wave and wavetable synthesizers of old. The four-tone synthesizer became the 'Sampled Sound Synthesizer', and development of this has been the focus of Sound Manager versions ever since. Sound Manager 3.3, which comes as part of QuickTime 3,



Much more than just beeps, Apple's Sound Manager and related Mac software components can be a route to low-cost audio on a Mac.

allows playback of multiple channels of 16-bit stereo audio sampled at 44.1 kHz — which is a considerable advance from the 11kHz sample rate and 8-bit mono of the first Macs. QuickTime also provides another 'synthesizer': the General MIDI one. Once again, successive generations have increased the fidelity of the sound reproduction, and the limited number of separate samples and the lengths of those samples has gradually increased — for example, QuickTime Musical Instruments version 3 contains 2Mb of Roland-derived samples. In fact, Apple's Sound Manager has increasingly become a software sample replay unit.

PC Soundcards

On the PC, sound was different. The beep started out simple, and the best way to improve it was to add a soundcard. Accordingly, a whole industry devoted to

ISA-buss soundcards has grown up, with a similar evolution from simple square waves, wavetables and Yamaha FM chips, through to 16-bit 44.1kHz sophisticated 'synthesizers on a card'. In the process, daughterboard modules with additional sound-generating capabilities have appeared, and MIDI interfaces are often available, albeit via a 15-pin 'D' type connector. The latest generation of soundcards are now also supporting the PCI buss.

The difference with the PC is that to make almost any sound at all, you need a soundcard — there isn't the default hardware and software that you find on a Mac. As a result, soundcards are bundled in with PCs, and are often used as a flexibility point for sales: 'for £nn more you can have a much better soundcard, sir!'

Macs may have sound facilities as standard, but when you want to move to digital, some of their renowned simplicity can give way to rather more complex decisions.

Going Digital

On a PC, the transition from soundcards to digital I/O cards has been relatively smooth. Since you need a soundcard, and because the market moves very quickly, users are used to changing cards when technology demands it. So moving from an analogue audio card to one with digital I/O as well is a simple step. On the Macintosh, things are less familiar — unless, of course, you have been running a Digidesign system. As a long-term Sound Manager user, I recently decided that the time was right to move up to digital I/O, and replace my Macintosh's 16-bit onboard analogue-to-digital conversion with something capable of higher resolution and potentially less interference-prone. Having 18- or 20-bit converters inside a computer isn't a good way of ensuring high fidelity, and one

Apple News In Brief

• SHOWTIME

November sees the show that used to be the Apple Expo, the only Mac-platform specific show. This year the event has been combined with the Total Design Technology show, and at the time I wrote this, it looked as if Apple had decided not to attend, and to organise something for next year — probably using the 'Apple Expo' name. So the show, which will be about to start when you read this, may not have the 'Apple' name in its title. From my experiences in previous years, the music content will probably be limited, but this doesn't stop it being a wonderful chance to see probably the largest gathering of UK Mac devotees, myself included. 25-28th November 1998 Olympia, London, UK

T Hotline: +44 (0)171 505 8713.

► of the useful spin-offs of PC soundcard technology is all the choices that are now available...

Well, that's the theory. I wanted a simple PCI S/PDIF and AES/EBU I/O card for a Macintosh, with stereo audio in and out. I would be using my

DAT recorder as my audio front end initially, but this way I had the option of a stand-alone high-resolution front-end converter should I need to upgrade at a later date. In a world just bursting with ASIO PCI cards you might think that my choices would be wide, but

On The Net

With SOS's Net Notes now joining the hardware-specific platform notes pages, the time couldn't be better to mention the vast support resources for musicians who use computers. Whereas a few years ago, a new driver software release might be difficult to locate, and even harder to install, the growth of the Internet means that things are much easier and faster now.

One of the first things I do when I buy a new piece of hi-tech music equipment now is to look for the manufacturer's web site. Increasingly, it is possible to register your new acquisition from there, and it is often a good source of hints, tips, technical support (via email or FAQs) and software updates. My visit to Lucid's site to get the latest drivers for my

new card is a good example — and don't forget that the web sites of distributors (SCV's pages, in the case of Lucid) can also be useful sources of information and help.

- W www.lucidtechnology.com/
- W www.scvlondon.co.uk/

I've given out my email address before in Apple Notes, and if you do a search on the Internet, you'll find me relatively easily. But now the SOS people have made it even easier for you to drop me a line:

- E apple.notes@sospubs.co.uk

I'd love to hear from you! I also visit the SOS Discussion Forums whenever I have a spare moment:

- W www.sospubs.co.uk:8080/~SoundOnSound

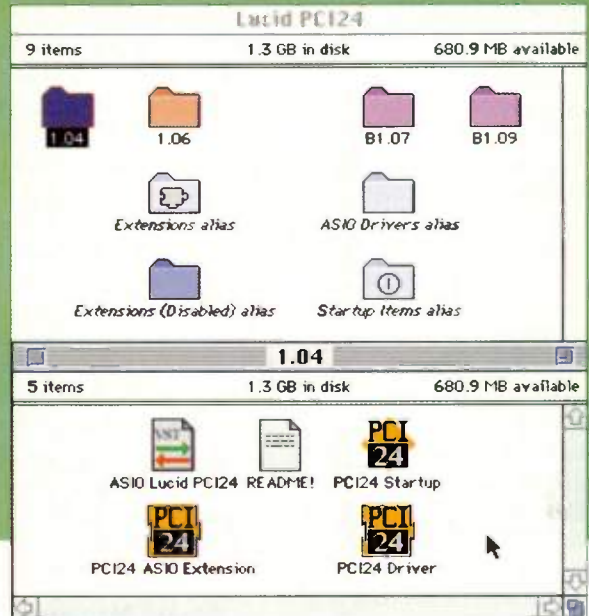


Tip Of The Month: Installing Made Easy

I like aliases. In fact, my Macs are littered with them. But I don't use them just for the 'home folder' tip that I detailed a few months ago (see August's Apple Notes). I also use them as a way of making installations of software easier. Whenever a piece of software requires Extensions or Control Panels to be updated regularly, just place aliases to the Extensions and Control Panels folders in the Home folder for the application. That way, when the

inevitable update to the drivers is released you can go to the Home folder and update the drivers easily.

Potential uses of this tip include anything that uses a Sound Manager driver, ASIO devices, PCI cards, and more. Any time that you want to update individual components of a piece of software (often from a download via a web page), this alias technique can be useful. It was one of the first things I did when I installed my audio I/O card...



Aliases can take some of the pain out of updating drivers.

whilst there are a large number of cards available offering digital audio interfaces to computers, as soon as you tie down your specification, the range can narrow down very quickly. In my case, the combination of S/PDIF, ASIO, PCI and Mac led me to the Lucid Technologies PCI24 card (there's also a NuBus version, and for analogue I/O use, the PCI24dsp adds audio inputs and outputs).

PCI cards are usually easy to install, and the Lucid card was no exception. But ASIO and Sound Manager drivers are more of a challenge. In one step, you leave the cosy world of Mac software hand-holding, and enter the world of software drivers. A quick visit to Lucid's web site showed that support for the PCI24 card was good — with a released update to the supplied drivers that came on a disk with

the PCI24 card. But whilst I was downloading from the ftp site, I couldn't resist grabbing a couple of betas as well. In the end, I had the supplied-on-disk version, the current release version, and two betas of various drivers. If keeping track of all these bits worries you, then you should read this month's tip (see box above)...

Digital Sound

We've come full circle. From the Mac being superior in beeps, via PC soundcards versus Apple's Sound Manager, to the gap years where high-end Mac users used Digidesign equipment, and Sound Manager was the only alternative, through the increasingly capable PC soundcards, to the current convergence, where, arguably, the Mac is now able to make the most of PC PCI cards! SOS



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FINGERSTYLES NEW from ILIO ENTERTAINMENTS. This approach to creating Acoustic Guitar sample libraries is so inventive, so useful, that you'll wonder why no one had thought of it before. Produced by Dan Portis-Cathers (Spectrasonics' "Heart of Africa") Fingerstyles consists of Guitar Patterns, Melodies, Cadences and Endings arranged in construction kits which can be assembled and overlearn to create complete, seamless tracks. Music styles include New Age, Blues, Folk, Country, Pop, Ballad, Rock, and others - nearly 40 compositions in all, each with as many as a dozen strums, riffs, patterns and melodies. Plus you get a variety of additional strummed chords, including extensions, for more flexibility. The speed with which you can create full-length, ultra-realistic guitar parts is startling. It's the perfect solution for soundtrack composers on a tight schedule, or anyone looking to add rich sounding fingerstyles to their mix. The six string acoustic steel is expertly played and recorded, and each performance is tempo-tuned so you can sequence the patterns with complete confidence. Whether soloed or mixed, you won't believe the realism. A class library designed to inspire and get results. Audio CD: £59.95 (Akai CD-ROM: £149.00).

FRETWORKS NEW from ILIO ENTERTAINMENTS. A landmark library featuring legends of the fretboard. Fretworks boasts an impressive roster of musicians playing an intriguing variety of stringed instruments. This collection is a journey "off the beaten path" capturing the soulful essence of Delta blues, Appalachian Folk, and the roots of rock, bluegrass, swing and shuffle. The rare performances were recorded in a musical context with all of the raw energy and "happy accidents" that make a track live and breathe. The vast musical experience represented in these fine performances will bring your tracks to that next level of quality and musicality. Audio CD: £59.95 (Call for availability/pricing of CD-ROM versions - coming soon).

HYPNOTICA 8/10 (KeyboardUSA). Produced by Perry Geyer and Greg Hawkes for East-West. "Fat phase-shifted and ring-modulated filter sweeps, eerie vibrato tones bouncing through a delay line, Theremin glissandi, chuffing machine clanks, crispy white-noise explosions, distant klaxons buzzing, whippy burbles, carvenous whispers - it's all here. The production values on Hypnotica are almost too high. Many of the samples consist of two or three layers of sound, almost like mini-production pieces of the trance/ambient variety. Reverb and chorusing add richness and space to a mix that glistens with high end. Truth be told Dr. Who never sounded this good. Audio CD: £59.95

BLACK BUTTA (9/10 REVIEW). Produced by MadJef Taylor for East-West. MadJef Taylor's album credits include artists like Janet Jackson, Michael Jackson, Boyz II Men, New Edition, Karyn White and many of the albums produced by Jimmy Jam and Terry Lewis. This has to be one of the phattest collections of dope beats and hip-hop grooves available anywhere. MadJef has compiled a fresh variety of beats, loops, scratches, bass and lead lines, live drums and fills, kicks, snares, and guitar samples in construction kits with MIDI-files. An absolute must for any Hip-Hop or R&B producer. His unique drum programming will put a groove in your tracks that will give you the edge you need to make great records. AUDIO CD plus MIDI-files: £59.95

ELECTRONICA 9/10 - Future Music (UK). Produced by Perry Geyer and Greg Hawkes for East-West. "With a range of tempos from 68bpm to a pounding 214 bpm, the spectrum of applications for these samples is reassuringly broad, and as a mixed mode CD, Electronica not only gives you audio samples - both as loops and individual hits - but also all the loops as MIDI files, allowing you to load the data into your sequencer and adapt or adjust the loops for yourself! The loops are generally excellent, and varied enough, both rhythmically and in terms of effects and production, to indicate that some serious time and effort has gone into this disc. Verdict - there's a broad range of applications for these well produced samples. The MIDI files are a big bonus as well. Audio CD & MIDI-files: £59.95



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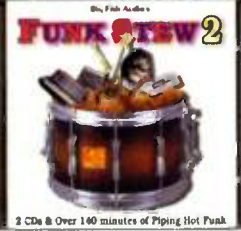
RARICUSSIONS Ethno Loops & Sounds. Raricussions explores the opposite side of Basicussions with its selection of acoustic percussion instruments never found before in a CD or CD-ROM soundbank: Brazilian Berimbau, African Fedudu and Tchengo-tche, Afro-cuban jug, as well as Bata, Kudu-Hapa, Ashkikos. Using the same bulletproof layout as Basicussions guarantees easy access to the loop you're looking for. Wide-ranging (from 60 to 140 bpm) the tempo selection covers every modern music style. As usual with USB's releases, a generous selection of individual samples is included. The first disc features all the loops in Audio format and a Mac/PC section with MIDI-files of the played groove. The second CD is a mixed-mode Audio/Akai CD-ROM. Its audio part is full of individual samples and the 500 MB Akai CD-ROM section offers the full selection. Most original and rich library of borderline ethnic percussions. 2 Disc Set (Audio CD plus Akai CD-ROM): £59.95 (includes MAC/PC format MIDI-files section). (Available from Autumn '98 - call to check availability).

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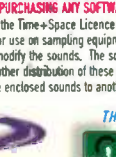
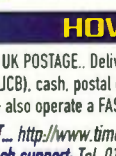
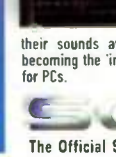
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Martin Walker explores the pros and cons of different soundcard drivers, fixes a problem with his IRQs, and still finds time to read a couple of books as well.

Soundcard drivers are not an exciting subject, but nevertheless an important one, since they are the vital glue between audio applications (such as sequencers and hard disk recorders) and the hardware that actually transforms the digital signals into music. There are now several different flavours of driver available, and the differences between these can cause a lot of confusion and frustration at times.

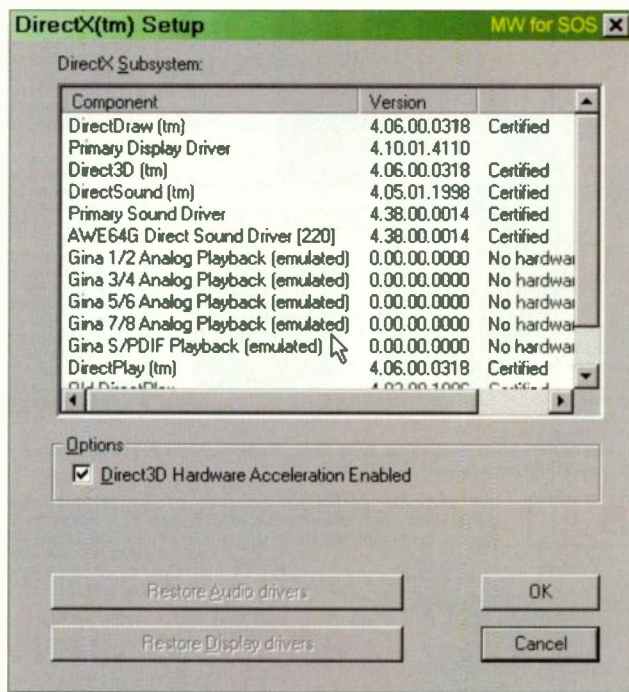
The most common form of driver is still the Windows Multimedia one (also known as MME, after the original MultiMedia Extensions built into Windows 3.1). This has the inherent restriction of stereo operation, which means any soundcard that has more than two inputs or two outputs must normally appear to applications as a set of stereo track pairs. Another disadvantage of these drivers is their relatively high latency (the delay between action and reaction), which makes many music applications seem sluggish. The main advantage is that almost every soundcard is likely to have this type of driver, making it a universal standard.

ASIO drivers were originally developed by Steinberg as part of the VST interface, and have been designed from the ground up specifically for mixing together multiple tracks of audio in real time. Steinberg provide a general purpose ASIO Multimedia driver to interface to standard drivers, but various soundcard manufacturers have also released hardware-specific ASIO drivers for their soundcards. The main benefit of having these is much-reduced latency — typically dropping from 500-700mS right down to

100mS or even less.

Latency is mainly a problem during recording, when an input signal will always be heard slightly late if it is being monitored via the software. However, many soundcard manufacturers now allow the input signal to be directly monitored via the soundcard hardware, so that there will be no audible delay. The only disadvantage of this is that you cannot hear an input signal with real-time effects, unless you use DSP effects on the soundcard which don't go through the software plug-in process (Lexicon's Studio and Yamaha's DSP Factory and SW1000XC are examples of this).

However, another big improvement when using hardware-specific ASIO drivers is general responsiveness. Transport controls such as Play and Record operate almost instantly, with none of the sluggishness of Multimedia drivers. Altering the position of knobs and faders is also far more immediate, making mixdown and automation a far more pleasurable experience, and recording and playback



This DirectX Setup utility shows which of your soundcards have Native DirectSound drivers. Here my AWE64 Gold is OK, but the Event Gina doesn't comply.

meters will also reflect the current audio levels much more closely.

Live And Direct

The third category of soundcard drivers is DirectSound, which is becoming increasingly important. Several years ago, games were held back on the PC by the higher overhead imposed on graphic and sound calls when running under the Windows operating system. Due to this, the vast majority of game developers stayed with DOS, so

that they could directly manipulate the PC at a much lower level, giving far more scope for a fast-moving, action-packed experience. The downside was that they also had to write a whole raft of drivers to support specific graphic cards and soundcards, which gave them a lot of tedious extra work.

Microsoft soon realised that to attract more game developers to the Windows environment, they needed to provide them with a way to get to graphic and sound functions at a much lower level than was previously possible, to provide a faster response and easier coding. DirectX technology provided just this, with components like DirectDraw and Direct3D for graphics, and DirectSound and DirectSound3D for sound. DirectSound was written to provide a low-latency way to mix together multiple audio streams for merging into a stereo output.

There are two forms of DirectSound support. Native drivers have been specifically written with DirectSound in mind, and will appear in every application that supports the DirectSound standard. Some

PC Snippets

Seer Systems' *Reality* software synth has just reached version 1.5, and the upgrade is free to all existing owners, who can download it from the web site (www.seersystems.com). However, at 14Mb, it's quite the largest download I've experienced, and you will need a password to access it (send your current details and serial number, and Seer will email the password within 24 hours). Anyone buying the new version will find one less item in the box — apparently the dongle protection has been removed after user complaints. Seer are sending me the new boxed version, so I will

report in more detail soon.

Native Instruments' *Generator* has also undergone an update since my review in the September '98 issue, and is now at version 1.5.6. Apart from a clutch of minor tweaks, there is now support for up to 64 MIDI channels, selectable levels of undo/redo, and consumption of system resources is greatly reduced. Also, you can now set Maximum Processor Usage in the Preferences section, which can automatically reduce the number of voices as required for each instrument to avoid CPU overload. Registered users should point their browsers at www.native-instruments.com, and prepare for a free 2.6Mb download.

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► applications will also allow emulated support, which allows other soundcards to work, but with increased latency (and increased likelihood of crashes in some cases). You can check whether your soundcard has Native support by running the DXSETUP.EXE utility which is supplied as part of DirectX 5 (the new DirectX 6 version doesn't show this information).

If the manufacturer has submitted its driver to Microsoft for thorough testing it may also be certified, although many don't bother due to the extra time and expense. An uncertified driver rarely compromises performance, and in many cases the newest uncertified drivers available from a web site may give better performance than older certified ones.

A Richer Experience

Initially, having DirectSound-compatible drivers for your soundcard was far more important for game players, but such drivers are now beginning to surface in a variety of more professional music applications. Steinberg's VST version 3.55 introduced the ASIO DirectX driver, which can be used instead of the ASIO Multimedia one if your soundcard has Native DirectSound compatible drivers (but not emulated ones). It has the advantage of lower latency, and several applications can access this driver simultaneously, which is ideal if you want to attempt running a software synth and MIDI + Audio sequencer side by side through the same soundcard. The big drawback is that you cannot record audio when using it. To give you an idea of the improvement, I set up my AWE64 Gold in *Cubase*, and measured a latency of 750mS with the ASIO Multimedia driver, but only 204mS after choosing the ASIO DirectX driver.

Other applications that use DirectSound to provide a richer experience are real-time software synths like Native Instruments' *Generator* and the new version 1.5 of Seer Systems' *Reality* (see

page 244), the Nemesys *Gigasampler* software-based sampling package (see the review starting on page 38), and Steinberg/Propellerheads' *Rebirth RB338*. The initial release of *Reality* had drivers that were tightly coupled to Soundblaster soundcards, to ensure low latency, but this left a large part of its potential market untapped. To work well with the maximum number of different soundcards, the new version 1.5 adds DirectSound support. It will be interesting to see whether this has affected its latency.

Generator, *Reality*, and *Rebirth* should work with soundcards that currently have emulated DirectSound support (such as the Event series), but with increased latency. *Gigasampler* will only run with soundcards that have Native DirectSound support; one of the cheapest of these is still the AWE64 Gold, along with the rest of the Soundblaster range. Others include the Terratec EWS64L, the Guillemot Maxisound, and some Turtle Beach cards (like the Montego and Daytona). Many consumer cards and most laptop audio chips have support as well, although these tend not to be so

suitable for hard disk recording.

If the choice is available, *Cubase* users should always opt for a hardware-specific ASIO driver. If not, then for mixdown and automation you may well find the ASIO DirectX drivers give better performance than standard Multimedia ones, but you will still have to change to the latter during audio recording. For other applications, using DirectSound drivers if available will normally reduce latency. The secret of DirectSound drivers seems to be that they are optimised for lots of small snippets of sound to provide low-latency streaming, whereas Multimedia drivers need large regular buffers of sound.

BX Conflicts

While moving across the expansion cards from my old PC to the new one, I came across a strange problem that had me completely stumped for a while. I had installed the latest drivers for my AWE64 Gold soundcard with no problems, but then audio playback only occurred in snatches — a second of audio would emerge, followed by several seconds of silence, then another snatch of audio. Towards the end of playing back

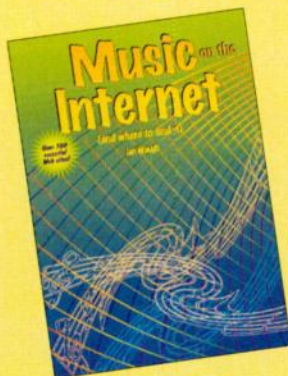
a WAV file in *Wavelab*, the playback pointer also started going backwards!

There were no resource conflicts, and to double-check this I even removed all my other expansion cards (after first disabling their drivers). Nothing cured the problem. Finally, after getting a tip-off about another obscure problem with a Terratec soundcard, I tried changing the IRQ setting from the IRQ9 value it had been automatically allocated by Plug and Play. This cured the problem straight away. Apparently, ISA cards cannot use IRQ9 when using the new 440BX motherboard chipset. Not a lot of people know that!

If you ever need to force an IRQ value in this way, first reserve the desired IRQ using the BIOS, by changing the appropriate IRQ entry in the PNP/PCI Configuration page from 'PCI/ISA PnP' to 'Legacy ISA' (I used IRQ 7). This will ensure that it isn't allocated to any other PnP device. Once back in Windows, you then go into the Resources page for the soundcard in Device Manager, untick 'Use Automatic Settings', and then change the IRQ value to the reserved value. **SOS**

Read All About It

I recently received a couple of books from PC Publishing, both written by Ian Waugh, who is a well-known author and contributor to several music magazines. *Making Music with Digital Audio* is a guide to audio recording on the PC, which covers a



Music On The Internet includes a guide to over 700 web sites of interest to musicians.

surprising amount of ground without falling into the trap of being so product-specific that it soon becomes out of date. The wide range of topics covered include the basics of both audio and the PC system, and build up through a thorough grounding in the theory and practice of soundcards, to audio software, plug-ins, digital audio, mixdown and mastering. This book provides a comprehensive guide for both the beginner and the more experienced PC musician who would like to know even more (ISBN number: 1-870775-51-1, and priced at £14.95).

The second, more recently released book is *Music on the Internet (and where to find it)*. Now you may think that the joy of surfing the Internet is the way that you come across unexpected sites by accident rather than design, but when you are actively searching out information on a particular subject it can seem a bit hit-and-miss, to say

the least. Following a general introduction to the Web, information on how newsgroups, mailing lists, and search engines operate, and useful sections explaining software downloading and troubleshooting, the bulk of this book comprises a comprehensive guide to 700 sites of interest to musicians. These cover musicians' own sites, manufacturers, software developers, music magazines (including *SOS* of course!), retailers, distributors, user groups and support sites. I already spend a lot of time on the Web, and although many of the details here were familiar to me, a lot weren't — I suspect I shall spend many more pleasurable hours in the future following up some of the sites mentioned. Since at current BT rates it can cost £1 an hour to be connected online, you could quickly reclaim the cost of this book (ISBN number: 1-87-077558-9, price £15.95). Both of these books are available through the *SOS* shop (call 01954 789888 for details).

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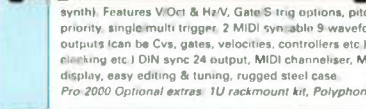
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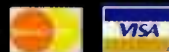
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Electronic Cow programs are moovin' on up, and French company Softjee have got UK distribution for their range of software. **Derek Johnson** checks out the Atari action.

We'll start this month's column by referring first to last month's effort. It was discovered after the column went to press that Electronic Cow's nifty *Squash It!* sample manipulation software will be a little more expensive than originally planned. The actual price of £79 (including UK postage, box, and A4 manual) is still hardly going to break the bank, though, and reflects the sheer number of features that the developers keep adding. One particularly nice new feature is a routine that allows audio — all the way up to a sampling rate of 48kHz — to be played back on an STFM; previously, audio playback was limited to STEs and Falcons. It looks as though other Electronic Cow software that was similarly limited in this way will be updated to include this routine; watch the Cow Net web site for more details.

In addition to the functions listed last month, *Squash It!* will also include ping-pong stereo delay, Rotary Speaker simulator, LFO, comb filters, lots of image filters (including blur, posterise, mosaic, smear, and mirror), a reverse tool, logic filters (including shuffle, de-click, shift, and flip), several stereo-to-mono conversion tools, explode (described as a kind of dynamic



Above: *Easy Beat* turns your Falcon into a virtual drum machine.

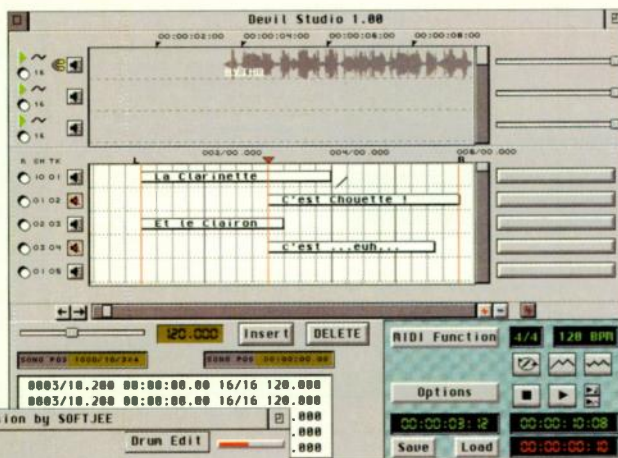
amplitude LFO, but far more severe!), and erode (featuring record crackle and low-frequency hum). *Squash It!* also has undo (to hard disk), sample analyse, drum split, and extensive clipboard tools. These include copy, auto-crop, smart auto-crop, cut out, paste, and several overlay modes — filter, ring modulation, and amplitude modulation. Note that the software will ideally require 2Mb of RAM or more.

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Drive Time

I neglected to mention a possibly useful fact about Floppyshop's new *Sounds and Stuff: The Atari Musician's Toolkit* CD-ROM last month, which is that it can be read on CD-ROM drives running with other computer platforms. I mention this because I don't actually have a CD-ROM drive permanently attached to my Atari, but I do have an Apple Mac with a drive built in. All I need to do to get the software (none of which is archived) across to my ST

is format a double-density 720k DOS disk in the Mac (ST-formatted disks are sometimes rejected by Macs), copy the files to it, stick the disk in my Atari's drive and run the software. This is also what I do with software downloaded from the Internet, since I don't use a modem with the ST either. And remember, this CD-ROM is very affordable at £25 plus £2 UK postage, from Floppyshop (+44 (0)1224 312756).



Above: The intriguingly named *Devil Studio* is a new MIDI + Audio sequencer for the Atari.

8-track audio with 64 virtual audio tracks. Parameters available for audio tracks include independent loops, graphic level and pan editing, solo and mute and more. MIDI facilities include key and drum edit windows.

Easy Beat is another piece of software for Falcon owners who wish they could run Steinberg's *Rebirth RB338*: it turns the computer into a virtual drum machine, complete with a set of TR909 samples. Your own sounds can be loaded, though, and there is full control (via a nifty mix window) over pitch, level and pan, plus distortion, echo and reverb effects. The sequence side of the program is pattern-based — 16 patterns of up to 16 bars each, with 16 beats per bar — with insert, track copy, bar copy and paste editing parameters available. The software comes on two disks, one containing the program, and the other the TR909 sound bank.

Also new is *Audiomid*, which is claimed to be the first audio-to-MIDI converter for any Atari computer. The software lets you read a digital audio file and convert it to MIDI data which can be saved as a Standard MIDI File. *Audiomid* can also play MIDI files, display the MIDI File in a key edit mode, and display the audio file side by side with the MIDI data. UK prices have yet to be set for the new software, but watch this space. **ES**

The French Connection

Across the channel is another software house that's active in the field of music software for the Falcon. Softjee have been plugged in this column before, but we've always pointed you to their web site or home postal address. Now you can buy domestically, since Softjee's range is now being distributed by Titan Designs. The pricing for Softjee products is as follows:

- *Digital Home Studio* MIDI + Audio sequencer, £89.95.
- *Midplay* 24-voice polyphonic MIDI file player/General MIDI sound source, £34.95.
- *Expand* virtual sound module and playback sampler, £44.95.
- *Live Machine* 8-track, live-oriented direct-to-disk recording tool, £44.95.
- *Digital Tracker* 32-track digital sampler/sequencer, £34.95.

You can pay by cheque or credit card, but contact Titan for delivery costs.

And, not surprisingly, there's more software on the way from Softjee. *Devil Studio* (odd name!) is another MIDI + Audio sequencer, this time offering 64 MIDI tracks running alongside

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emphasise the floating feel of the vocal throughout, to fine drum and bass programming and unobtrusive placement of the keyboards in the mix. I especially liked the mass backing vocal section on the chorus before the middle eight, which was treated with a short room reverb to give it its own space in the mix.

Many different vocal parts were recorded and used for the Jungle mix, from both Stephanie and a Ragga Rap section of



guitar, bass, vocals and drums has led in their case to some

top tane

looped vocal providing a tension point as a counterpoint

retrozone synthesizer

KORG DW8000

► A separate sample is used for each octave and the waveforms are recreated using additive harmonic synthesis. The result is a set of waveforms that, whilst more varied than its purely analogue predecessors, certainly lacks the breadth of tonality of a Roland D50, or Korg's later M1.

Not a particularly inspiring start, you may think, but the fun has only just begun. Both the VCA (Voltage Controlled Amplifier) and VCF (Voltage Controlled Filter) are just what they imply — 'Voltage Controlled'. For those brought up on a digital diet, read 'analogue'. What this amounts to in practice is a smoothness and, in the case of the filter, a musical richness that more than makes up for the relatively limited range of waveforms. The VCF is fully resonant, giving a gorgeous whistle at high settings and purring beautifully over low-pitched notes — quite Moog-like, in fact.

Keyboard velocity and aftertouch are routable to volume and filter cutoff. Aftertouch can also be programmed to introduce vibrato.

Typical of its time, the DW8000 has a selection of key assign modes. Normal polyphonic playing is obviously taken care of, with a further mode to make use of polyphonic portamento. The Unison modes stack all eight voices together for a much fatter (monophonic) sound. What a pity that the ability to detune the voices in unison mode was not included — the results would have been fatter than a very fat thing indeed.

Delays and Arpeggios

The digital delay conceptually glued across the DW8000's outputs was quite a revolution for its time — indeed, the first of its kind. Delay time (up to a maximum of half a second), feedback and level are all programmable for each patch, as is a modulation effect to create chorus or flanging effects.

An arpeggiator is a wonderful thing, to my way of thinking, and the simpler they are to use the better I like 'em. Five controls are about all I need when I'm looking for some instant inspiration. I switch the arpeggiator on; I tell it which direction to scan the keys and over how many octaves; I hit a fistful of notes; I latch them and then adjust the speed to taste. Yes, I know that today's arpeggiators are considerably more sophisticated, and I enjoy using them too, but this kind of immediacy is not to be sniffed at. The arpeggiator will happily clock to incoming MIDI clock data for synchronisation to your sequencer or drum machine.

As far as MIDI is concerned, the DW8000 is reasonably conversant. Parameter changes can be applied on the fly, and patch data can be dumped to external storage devices (much better than using the included tape interface — ugh!).

On The Downside

So, are there any flies in the ointment? Well the non-programmable tuning is a bit of a pain. Catch the tuning slider during a live performance and you could lose a few friends. Quite why tuning is believed to warrant instant front-panel access at all times remains a mystery to me.



The DW8000 has no patch names, which is frustrating, although I've created a name list in *Cubase's* Studio Module for my most oft-used patch banks. The stereo outputs are also problematical. The unwary would plug a pair of cables into them and assume that their machine was delivering glorious stereo sound. In reality, the only aspect of the sound that is in stereo is the digital delay. Fair enough, you may think. But I have to add that this is pseudo-stereo created by passing opposite phase signals down the left and right outputs. If you still haven't figured out why this is a problem then I hope you never hear your recordings played back in mono — where the left and right delay signals will cancel each other out, leaving your DW8000 sounds bare and stark to the world! The answer is to make use of the mono output only to avoid any such problems.

My only other gripe is that the darn thing always starts up in Omni mode and promptly tries to play every other MIDI instrument's part! My solution is to include an Omni-off message in my default *Cubase* song and run it before I begin work.

The End Result

Given a well-programmed machine, what are the highlights that might be expected? Bases are probably one of the DW8000's strongest suits. The low end is generally thick and powerful and sits under a mix with confidence. Chunky mid-range sequence sounds are also particularly appealing, especially given a tweak of the data slider to modulate the filter as it plays. Lead patches are capable of both aggression and subtlety, as required. There are certain characteristically 'nasal' lead sounds that I have never managed to recreate on any other synth — a kind of 'oboe on acid' for want of a better description. Autobend adds a certain slurring to note attacks that is inspiring to fool around with.

The DW8000 is very much a synth, not a sample playback device, so don't expect the acoustic piano waveform to render anything much like a Steinway! The waveforms are essentially raw material to be mangled by the synthesis engine. Pad sounds are thick and rich, but never seem to sit in a mix particularly well in my experience. String sounds are also warm and powerful, but just don't seem to cut it when other sounds are around. I mention these points not as damning aspects of the machine, but as a reminder that no synth will be all things to all players. Utilise a device to exploit its strengths, forgive it its weaknesses, and it will pay you back accordingly. **50%**



Top: The EX8000 was the rackmount version of the DW8000.

Above: The optional MEX8000 memory expander provided for additional banks of 64 patches.

Buyers Take Note

If you set out to buy a DW8000 then look out for models with the optional MEX8000 expansion fitted which gives an extra four banks of 64 patch locations — well worth a few quid extra. A particular Achilles' heel is the keyboard, which is prone to mis-triggering after periods of low usage due to the build up of dirt around the contacts. This is not hard to cure, and could prove a bargaining point if you are willing to take the risk that it's nothing more serious. The EX8000 is the rackmount alternative (see above), but is more difficult to find than its keyboard cousin.

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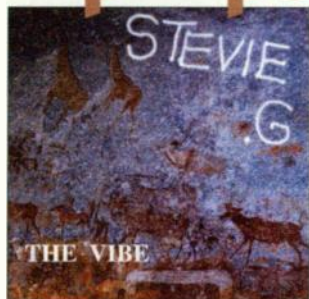
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top tape



Stevie G

Recording Venue: Home
Recording Equipment: Tascam M3500 desk, Tascam MSR 24S reel-to-reel multitrack, Power Mac 8200/120MHz running Emagic Logic Audio, 2 x Alesis Quadraverb reverb units, Ensoniq DP/4+ multi-effects, Drawmer M500 dynamics processor, DF320 noise filter, LX20 compressor/expander, Korg DRV3000 reverb unit, Focusrite Green EQ and mic amps, LA Audio compressor, SPL Vitaliser enhancer, Behringer Quad gates, Tascam DA30 DAT recorder, Fostex CR200 CD recorder.

Main man Neil Butlin has invested heavily in recording equipment over the years, but to give him his due, he certainly knows how to use it. Four mixes are presented on this CD demo, three of which are Radio edit, Jungle and House mixes of the same song. The opening track is a radio edit of the remaining song entitled 'The Vibe'.

The start is a typical chart dance attention-grabber, with a

looped vocal providing a tension point as a counterpoint to an ascending string line. Semi-spoken vocals are placed up-front in the mix, while explosive drums and low-pitch cymbal provide the drama in the background. This is fairly standard fare, and very well executed, but when the beat comes around we get a neat change from the usual frantic stuff. Instead, there's a minimal, heavy drum and bass groove behind the verse vocals, which is a neat touch, allowing the bigger sound of the chorus (more vocals, sweeping chords, arpeggiated high notes) to have more impact when it arrives. The bass used is probably the Novation BassStation with some very low, warm tones that never overshoot in the mix. Overall a well-mixed piece of pop/dance.

'Look Into Your Heart' (Radio Edit) was my favourite on the CD, bearing all the classy hallmarks of the opening song but with a better vocal performance. While I'd describe the first song's vocal as workmanlike, this second piece is just more suited to vocalist Stephanie's range and power. All the lead vocals on the CD were recorded through a Groove Tube microphone and a Focusrite preamp to tape, because Neil prefers the sound of analogue tape. Not only that but he also recommends Ampex 499 over 456 for its improved presence on his MSR24S. The resulting vocal sound is indeed glassy and sits well in the mix.

Plenty to recommend on this mix too, from the use of echo to

emphasise the floating feel of the vocal throughout, to fine drum and bass programming and unobtrusive placement of the keyboards in the mix. I especially liked the mass backing vocal section on the chorus before the middle eight, which was treated with a short room reverb to give it its own space in the mix.

Many different vocal parts were recorded and used for the Jungle mix, from both Stephanie and a Ragga Rap section of unknown origin. The use of beats was a bit unadventurous, but otherwise a decent mix. The House mix was more successfully executed, but I must admit that I still can't get used to hearing vocal samples in a completely different musical key to the backing if they're more than a couple of notes long. ■

Brazil

Recording Venue: Finsbury Road Studios, York.

Recording Equipment: Soundcraft Spirit desk, Apple Macintosh running Emagic Logic Audio, Yamaha SPX 990 multi-effects, Lexicon LXP15 reverb/multi-effects, AKG and Shure mics, Akai S1000 sampler.

Formed just over nine months ago, Brazil are already committing their best material to CD in demo form. The line up of



guitar, bass, vocals and drums has led in their case to some moody pop which would probably have been labelled 'Indie' about five years ago.

There were some technical problems with this CD, which suffered from a crackling noise sounding suspiciously like digital overload throughout, and was particularly noticeable on the guitar at the start of the first song. It's often worth checking recordings before sending them out — if you're tackling a big mail-out it's obviously not practical to check them all, but checking a random sample wouldn't be a bad idea. I must admit to being caught out myself on this!

Meanwhile, back at the first song Gwyn on vocals turns in a good performance, and has been given a sympathetic vocal sound and mix by the Finsbury Road engineer. Over a sparse backing of acoustic guitar, bass and drums, with electric guitar on the choruses, there is space in the mix for effects on the vocal. Consequently, it's treated to a touch of echo and shortish

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► reverb that is just about right in this context. It also has enough presence to sit over the guitars, and enough body to sound strong.

The electric guitar is played with energy by Stewart, but the sound is pretty boxy, by which I mean there's an abundance of 400Hz in the sound when some lower frequencies and presence would have helped. I do like a lot of the playing though, particularly on the second song 'You Can't Say' where some of the harmonics and tortured noises produced by the overdriven thrash guitar are excellent. Ant the bass guitarist goes for the Stranglers sound with plenty of twang and some overdrive, which suits the song well and could only have been improved with some more low bass.

So, in general a well-performed demo that amply demonstrates where Brazil are coming from musically (more Berlin than Brazil anyway). Shame about the noise problem, but these things happen occasionally. ■

Sattva

Recording Venue: Home
Recording Equipment: Not specified.

This CD from Sattva is entitled *Mandolining It*, although the tracks seem curiously devoid of anything resembling a mandolin! However it does contain lots of other interesting and well-recorded sounds. The music itself has a jazz flavour in places, but also sports elements of



Sattva.

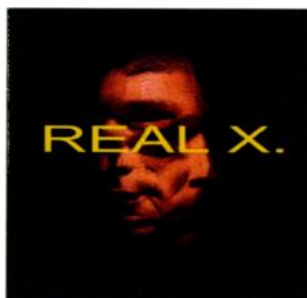
lightweight pop reminiscent of early Thomas Dolby songs, and sounds rather classy. This is aided by the excellent recording of the instruments, use of effects and general production feel which is wonderfully moody.

The real drums sound very natural, although I suspect that the basic elements were recorded individually. For example on the second song 'Bless You' the kick and hi-hat were probably put down first and the toms and crash cymbals overdubbed. The tonal separation and clarity of the sound tends to suggest that this was the case, and in fact it was a fairly common thing to do in the mid '80s.

Vocally, Jane Koehorst gives an excellent performance on all the songs. Her style is reminiscent of the late Karen Carpenter in its relaxed accuracy, and has been excellently captured although no microphone is specified. Judging by the amount of presence and the use of breathing as part of the vocal sound, a condenser and a compressor must have been used. Some of the vocal reverbs chosen seem a little strange, with gated and small rooms proving popular. I wonder if this was an attempt to emulate some of the effects that Kate Bush has used using a room mic and compression?

All the musical performances are strong, with some fine understated bass playing in places, and good guitar and piano work, both electric and acoustic. The tracks that work

the best for me are those that veer towards some experimentation with sound texture, although it has to be said that the quality of both arrangement and production are high as the CD stands. ■



Real X

Recording Venue: Home
Recording Equipment: Fostex M80 8-track reel-to-reel, AKG C1000S mic, Mackie 1202 mixer, PC running *Cakewalk Pro Audio v3*, *Cool Edit Pro (demo version)* and *Rebirth RB338 (demo version)*, Terratec EWS 64L soundcard, Alesis Midiverb reverb unit, Fostex 812 mixer, Sony DTC1000ES DAT recorder.

Real X attempt to fuse dance, indie and funk on their new CD EP: in some places it works, and in others it's an awkward fusion. For example, the first song begins life as a standard anthemic rock workout, but uses a dance-influenced break which doesn't quite come off. The most

important reason why this doesn't work is the change in level of the mix whenever the break occurs, moving up a hefty 9dB. As a result, the break gives you a shock the first time it happens — which is fine, but because it's so different in level to the rest of the song arrangement, the rest just sounds underproduced and wimpy in comparison. When you're mastering during post-production or even mixing, a change in level of just a few dB can have an enormous impact on the way a mix is perceived, and I'd say this is a case of over-enthusiasm to run with what seemed a good idea at the time.

The second track is an improvement because it takes a dance beat as its base, played by a real drummer. In order to create a really effective fusion of styles, however, the drummer would be playing along to sampled beats and loops. To some extent this has been tried by playing in a bass-synth pattern, but once again the heavy-handed mixing has made this part so loud that it's out of context and sounds a bit token. This is a shame because the song itself is good, with all the group turning in a performance full of energy and commitment.

It's on the final song that the fusion of sequenced synth and guitar works best, with a question /answer section between wah guitar and a synth loop, and the addition of this loop on the chorus (mixed too loud again, I'm afraid, and at the expense of the vocals). As for the rest of the sounds they've been well recorded and played. The general rock/pop sound is all there with a warm, ballsy bass guitar sound sitting underneath chunky aggressive guitar, driven along by a solid drum sound. With some more experimentation and a more carefully considered integration of dance production into the sound, Real X could come up with a formula for the right brand of music. ■

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The MMR4/4 is a 4 in/4 out MIDI patchbay with 4-way merge. MIDI setups can be Memorised into the MMR4/4's non-volatile memory for quick changes. The MMR4/4 is also available in a 1u 19" rack form for £125.



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The MSY2 is a MIDI to Sync 24 converter. Allowing synchronisation of TB303, MC202, TR606, TR808, CSQ600 and any other device that uses the Sync 24 standard. MIDI Start/Stop are also converted.



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A real analogue expander, with MIDI and CV/gate. VCO with pulse width modulation and dedicated LFO that will go into the audio range as well. VCF will self oscillate easily and has its own LFO (that also goes into the audio range), the VCA and VCF can be controlled by velocity, with a full ADSR envelope. External signals can be processed through the filter. All MIDI settings are memorised at power down.



REGELWERK £449

The Regelwerk is a combination of a fully programmable MIDI controller and analogue style sequencer with MIDI (2 in/2 Outs) and CV/Gate interfaces (8x CV/Gate sockets), and can actually perform both tasks simultaneously. 64 presets, 64 Patterns and 128 snapshot memories are all battery backed. Can be synchronised to MIDI or Syne 24. can be used as a system exclusive editor as well as controllers and can also process incoming MIDI data in realtime.



MAUSI £99

The MAUSI is a single channel MIDI to CV converter with Syne 24 interface as well. The CV can be set to 1V/octave or Hz/volt (Korg/Yamaha) and the gate can be set to V-trig or S-trig. A second CV output is provided for additional voltage control of a VCF. The MAUSI also generates an LFO and has portamento on board. All settings are memorised in non-volatile memory.



MCV4 £69

The MCV4 is the most cost-effective MIDI to CV Interface. Dedicated to 1V/octave, but supports V-Trig and S-Trig. Three additional CV outputs are provided for real time control from aftertouch, velocity and any controller.

QUICKIES



▶ **A Deluxe Breed** Last reviewed in January this year, A Deluxe Breed have produced a nine-song CD of their material. The sound is still early '80s retro with nods to Joy Division, early Simple Minds and the like. To set the musical scene, the (real) drums are treated to a hefty dose of gated reverb and the bass guitar is flanged and plays along with the sung melody in places — I'm sure you get the picture. A lot of the instrumentation is retro, like the Sollna Strings, Korg MS1 sequencer and Prophet. The production sound has been well considered and aimed at the people who liked it first time round, and hopefully they'll gain a few converts as the songs are good examples of the genre. ■

Brian Stephen Adams

Brian's been involved in music for the past 15 years, but has been taking it 'seriously' for the last three. His instrumentals are based around piano compositions, aided by synthesized string arrangements and guitar. He moves from the weepy movie style of 'Lost Times' to the testcard jazz of 'Night Drive' and the Children's TV drama soundtrack of 'Her Winter Garden' with ease. All the arrangements feature lush strings, and a little more variation in the choice of sounds might open some more doors for him if he wants to make a living at this music thing. Having said that, what he has got is a good demo of what he does best. ■

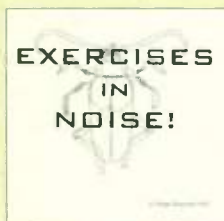
Mike Ticehurst Someone else who'd like to earn a living at music but is currently treating it as a hobby is Mike Ticehurst. Mike's tape sounds a bit on the toppy side and

also distorts on the loud sections. The over-equalisation has occurred in the upper-mid 6kHz range, which is a common mistake to make when you are fairly new to the recording side of things, as Mike is. It usually occurs when people confuse clarity with treble, and as a result add upper mid or treble to all the sounds, instead of choosing sounds that complement each other in their various frequency ranges. As for the songs, my favourite was 'She'll Not Show Again', with a touch of later Bryan Ferry in the choice of melody and vocal treatment. ■

Tabatha This Leeds-based three-piece recorded their demo live in a small front room, and are looking for some good constructive criticism on how to get a good sound. The desk and tape machine — Spirit and ADAT respectively — are OK, as are the mics for drums — Shure 57, 58 and AKG C1000s. I'd have miked the guitar up through an amp for this kind of raucous pop, using a hired or borrowed SM57, and used the cheap dynamic mic only for a guide vocal take.

In these sort of situations, the spill of other instruments down the vocal mic is going to severely compromise the recording quality, and in any case the vocals are the most important thing and should have the benefit of the best mic — either the C1000 or the 58, depending upon what suits the voice best. So it would definitely be better to overdub the vocal after the backing is down. Another tip is to try and use EQ as little as possible on everything, except the bass drum which will usually need a lower-mid frequency cut at around 200Hz to sound decent when close miked. Of course you could read all about this and more in the new edition of my book *Tips for Recording Musicians!* ■

Roger Foxcroft Roger sent not one, but two CDs of his music. He plays piano and guitar and composes in such a variety of styles that one was not enough! Well, a cassette with three different tracks would have been better for the purposes of this column, though I gave a brief listen to most of the tracks. Friend Phil has done a good job engineering on these instrumentals, although some of the



built-in effects on the modules start to sound similar and wearing after a while. My favourite on the *And Then There Was Me* CD was 'Isabella's Waltz'; despite its heavy borrowing from Enya, it was nevertheless a well-conceived piece. The dance tracks on *Exercises In Noise* were more early '80s in production style and use of rhythm, although the recording was once again well-executed, so some of the tracks ended up sounding more progressive rock than progressive. ■

Simon Taylor Simon makes the most of his comb filter modulation at the start of the opening song 'Elysian Fields'. It pitch-sweeps away in the background of this piece creating a muffled, hollow-sounding wind effect which adds to the rather sombre music, lyrics and atmosphere. There are some nice vocal touches in the production, like the almost shouted chorus, treated to a heavy dose of reverb, and the sudden dry vocal at the end. By contrast, the second track is a more standard pop song reminiscent of John Lennon in places. Here again there are some nice vocal touches, with a telephonic voice repeating the words on one of the choruses, and the incorporation of a real breathing sample into the rhythm track. After all, the title of the song is 'Can't Breathe Without You', and the sample forms an effective and subtle part of the beat without ever dominating. ■

Flip The Lid This one is a slice of good-natured folk, ranging from Irish reels to the beautiful ballad 'As I Roved Out'. There are also some originals like the amusing invitation to a lock-in from mandolin player Tony, whose shaky vocals give just the right feel to such a drinking song. Apparently they recorded it live and tarted it up with a few overdubs. This seems more apparent on the vocals, where the live take suffered from too much spill (the vocalist also plays the Irish drum). Both the main vocalists Simon and Al have good voices

which come across well on this demo. The mix is helped by the use of a good compressor, which has obviously taken care of the more exuberant playing and, as a result, peak signal levels. On the basis of the demo the band would be worth going to see live for a good night out at a pub gig if you're ever in the Bristol area where they're based. ■

Jason Boyd Jason is a student of Music and Music Technology and hopes to write scores for film and TV after college. He makes the point that it is easier to compose when you've got a visual image as a catalyst for the music, and for some I'm sure that this must be the case. His new age/world (his categorisation) pieces are well-constructed with good use of the available sounds on the Roland SC88 sound module, particularly the ethnic instrumentation. On the technical side, I'd advise sending out demos on Chrome cassettes, not ferric, and using higher record levels on the cassettes themselves, because some of the dynamically low sections were pretty noisy — signal was not even registering on the cassette meters.

Jem From the heart of Portsmouth's bedstland comes a slice of bittersweet guitar-based pop. Recorded using *Cakewalk Pro Audio* and *Sound Forge* on a self-built PC, the sound is a bit on the thin side — more as a result of the guitar and drum sounds used than the recording medium I suspect. Some post-production EQ



could easily straighten this out with slight cut at 2kHz to remove the harshness, a bit of a boost at 350Hz for body, and a 4dB boost at 12kHz for polish! I thought the songs had a lot of potential, especially 'I'm Letting Go' and 'Precious' where Jem's emotive vocals work best. It also seems obvious to me that this music is in need of a band to fulfil its potential, but such things seem harder and harder to get together these days with any chance of success. In the meantime keep songwriting and recording. ■



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digital age

KORG DW8000 SYNTHESIZER

"The synthesizer that's more than digital." That was how Korg described their 1985 synth, the DW8000. Those were the days when all things digital were considered to be intrinsically good, whilst all things analogue were inherently outmoded. The irony in the case of the DW8000 is that the features that arguably make it "more than digital" are, in fact, analogue! Whilst that may have been considered something to gloss over in the mid-'80s, by today's standards it is something to crow about.

More Than Digital

The DW8000 made use of Korg's DWGS (Digital Waveform Generator System). What this amounted to was sampled waveforms stored in four 256Kbit ROM chips. At the time it was considered important for manufacturers to come up with proprietary acronyms for their synthesis technologies to give an air of wonderment to new synths, and Korg were very much on the bandwagon with DWGS. This has often been seen to backfire, and the DW8000 has generally been overlooked, being seen as little more than an S+S synth with a limited palette of waveforms.

Essentially, however, the DW8000 is an analogue synth, with digital waveforms piped in at one end, and a digital delay clamped across the other. The most important aspect of the machine, the filter, is most assuredly of the analogue persuasion. Polyphony is fairly restricted at eight voices, but since the DW8000 is a monotimbral synth, this is not really a problem in general use. The keyboard is both velocity- and pressure-sensitive, and the cutesy little Korg joystick is ever-present for pitch and filter modulation duties.

Patching Up

Editing is simple, if lacking in immediacy. Parameters are dialed up with the numeric keypad and the parameter value changed by use of the data slider, or up/down buttons. With a grand total of 53 adjustable parameters, this is a tolerable working method, but there are several computer editing options available as an alternative, including free examples on the Internet. Using the editing facility to make adjustments during performance is perfectly feasible and is one of the DW8000's little pieces of magic.

Two oscillators are provided, with the ability to adjust the relative levels and to detune oscillator 2 for a rich, chorused effect. Four parameters relate to the DW8000's 'autobend' feature, which sweeps the pitch of either, or both, oscillators up or down to its true note over a specified time and by a specified amount following the press of a key. Although this feature may not seem particularly exciting, it does have the capability to add interest to the attack of notes and imparts a certain 'weirdness' that is very appealing. Korg added a separately mixable noise generator, which was quite generous.

Simple Samples

The 16 sampled waveforms are interesting. Having cast off the limitations of the standard analogue synth's sawtooth, square and sine waveforms, Korg chose to push back the boundaries of sound by including such raw digital material as, well... sawtooth, square and sine waveforms! I'm being quite cruel here, as they also included more complex waves such as bells, clavinet, acoustic and electric pianos, organ, guitar and sax. ▶

Paul Ward

reintroduces an instrument now widely neglected on account of its 'digital' tag, and argues that it still has much to recommend it.

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KORG DW8000

► A separate sample is used for each octave and the waveforms are recreated using additive harmonic synthesis. The result is a set of waveforms that, whilst more varied than its purely analogue predecessors, certainly lacks the breadth of tonality of a Roland D50, or Korg's later M1.

Not a particularly inspiring start, you may think, but the fun has only just begun. Both the VCA (Voltage Controlled Amplifier) and VCF (Voltage Controlled Filter) are just what they imply — 'Voltage Controlled'. For those brought up on a digital diet, read 'analogue'. What this amounts to in practice is a smoothness and, in the case of the filter, a musical richness that more than makes up for the relatively limited range of waveforms. The VCF is fully resonant, giving a gorgeous whistle at high settings and purring beautifully over low-pitched notes — quite Moog-like, in fact.

Keyboard velocity and aftertouch are routable to volume and filter cutoff. Aftertouch can also be programmed to introduce vibrato.

Typical of its time, the DW8000 has a selection of key assign modes. Normal polyphonic playing is obviously taken care of, with a further mode to make use of polyphonic portamento. The Unison modes stack all eight voices together for a much fatter (monophonic) sound. What a pity that the ability to detune the voices in unison mode was not included — the results would have been fatter than a very fat thing indeed.

Delays and Arpeggios

The digital delay conceptually glued across the DW8000's outputs was quite a revolution for its time — indeed, the first of its kind. Delay time (up to a maximum of half a second), feedback and level are all programmable for each patch, as is a modulation effect to create chorus or flanging effects.

An arpeggiator is a wonderful thing, to my way of thinking, and the simpler they are to use the better I like 'em. Five controls are about all I need when I'm looking for some instant inspiration. I switch the arpeggiator on; I tell it which direction to scan the keys and over how many octaves; I hit a fistful of notes; I latch them and then adjust the speed to taste. Yes, I know that today's arpeggiators are considerably more sophisticated, and I enjoy using them too, but this kind of immediacy is not to be sniffed at. The arpeggiator will happily clock to incoming MIDI clock data for synchronisation to your sequencer or drum machine.

As far as MIDI is concerned, the DW8000 is reasonably conversant. Parameter changes can be applied on the fly, and patch data can be dumped to external storage devices (much better than using the included tape interface — ugh!).

On The Downside

So, are there any flies in the ointment? Well the non-programmable tuning is a bit of a pain. Catch the tuning slider during a live performance and you could lose a few friends. Quite why tuning is believed to warrant instant front-panel access at all times remains a mystery to me.



Top: The EX8000 was the rackmount version of the DW8000.

Above: The optional MEX8000 memory expander provided for additional banks of 64 patches.

The DW8000 has no patch names, which is frustrating, although I've created a name list in *Cubase's* Studio Module for my most oft-used patch banks. The stereo outputs are also problematical. The unwary would plug a pair of cables into them and assume that their machine was delivering glorious stereo sound. In reality, the only aspect of the sound that is in stereo is the digital delay. Fair enough, you may think. But I have to add that this is pseudo-stereo created by passing opposite phase signals down the left and right outputs. If you still haven't figured out why this is a problem then I hope you never hear your recordings played back in mono — where the left and right delay signals will cancel each other out, leaving your DW8000 sounds bare and stark to the world! The answer is to make use of the mono output only to avoid any such problems.

My only other gripe is that the darn thing always starts up in Omni mode and promptly tries to play every other MIDI instrument's part! My solution is to include an Omni-off message in my default *Cubase* song and run it before I begin work.

The End Result

Given a well-programmed machine, what are the highlights that might be expected? Bases are probably one of the DW8000's strongest suits. The low end is generally thick and powerful and sits under a mix with confidence. Chunky mid-range sequence sounds are also particularly appealing, especially given a tweak of the data slider to modulate the filter as it plays. Lead patches are capable of both aggression and subtlety, as required. There are certain characteristically 'nasal' lead sounds that I have never managed to recreate on any other synth — a kind of 'oboe on acid' for want of a better description. Autobend adds a certain slurring to note attacks that is inspiring to fool around with.

The DW8000 is very much a synth, not a sample playback device, so don't expect the acoustic piano waveform to render anything much like a Steinway! The waveforms are essentially raw material to be mangled by the synthesis engine. Pad sounds are thick and rich, but never seem to sit in a mix particularly well in my experience. String sounds are also warm and powerful, but just don't seem to cut it when other sounds are around. I mention these points not as damning aspects of the machine, but as a reminder that no synth will be all things to all players. Utilise a device to exploit its strengths, forgive it its weaknesses, and it will pay you back accordingly. **SOS**

Buyers Take Note

If you set out to buy a DW8000 then look out for models with the optional MEX8000 expansion fitted which gives an extra four banks of 64 patch locations — well worth a few quid extra. A particular Achilles' heel is the keyboard, which is prone to mis-triggering after periods of low usage due to the build up of dirt around the contacts. This is not hard to cure, and could prove a bargaining point if you are willing to take the risk that it's nothing more serious. The EX8000 is the rackmount alternative (see above), but is more difficult to find than its keyboard cousin.

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TECHNICS WSA1R modular synth, 64 voices, 32 parts, highly programmable, £580, Casio VZ10M, 8 oscillators per voice, FM-type synth, £150, SDE FM synth, £140. **0181 783 0537**

TECHNICS WSA1R, £700 or swap for good analogue, bass or multitrackier. **01324 872115** (Falkirk)

TEISO 110F lead synth, Korg Poly 6, recently serviced with a new back-up battery, must sell, £350 ono. **Ed** 01270 624080 (Cheshire)

VISCOUNT D9 drawbar organ, same styling as the Hammond XB2 overdrive and Leslie simulator, £400 ono, Alessi D4 drum module, £200 ono. **0171 598 1044**

YAMAHA DJX dance/performance keyboard, packed with ear-boggling sounds and professional features, brand new with Quicklok stand, exchange or part-exchange for a Yamaha QY70/QY700. **01639 768103** (South Wales)

YAMAHA CS70M analogue, Kenton retrofit, very rare, £500, Casio FZ1 sampler, fully upgraded, 8 outs, graphic editing, £300, Kawai K1M synth module, £100. **David** 01460 57813 (Somerset)

YAMAHA CS1X control synth, mint condition, boxed, leads, manual, £390. **01582 753140** (Bedfordshire)

YAMAHA DX21 FM synth, great condition, manual, £140 ono. **Gary** 0121 445 5274 (Worcester)

YAMAHA EM710 sound module, pianos, strings, bass, £80, Viscount RD70 MIDI filter, sequencer, floppy disk drive, stores MIDI system exclusive files, both manuals, in very good condition, £115. **Tony** 01222 405172

(Cardiff)

YAMAHA EX5 76 note synth/sampler, reads Akai WAV samples 64Mb RAM, excellent condition, boxed, £1450 ono, Apple Power Mac 7200/90, 1.2Gb, monitor, VST, £500. **Steve** 01429 222517/295838 (Hartlepool)

YAMAHA MU90R, 32-part GM/XG sound module, six 24-bit effects processors, easy editing via data wheel, two MIDI ins, MIDI out and thru, two AD inputs and four outputs, 19-inch rack, boxed, mint, £385. **0181 346 8418**

YAMAHA P50M piano module, £150. **Ian** 0161 998 9659 (Manchester)

YAMAHA QS300 music production synth, 16 track sequencer, 954 sounds, 6 months old manual, £700. **Monty** 0468 866839 (Kent)

YAMAHA SY22 vector synth, all manuals, good condition, £200 ono. **Alan** 01234 240335 (Beds)

YAMAHA SY55, £250, no offers, QS300, will not sell, swap only for a QY300 plus £300. **Paul** 01229 466238 (Cumbria)

YAMAHA SY85 workstation synth, 30-voice poly, 61-note keyboard, disk drive, 8-track sequencer plus drums, 16-part multitrack, 4 outputs, sample RAM expanded to 2.5Mb, 256 voices/128 performances, boxed, manuals, extra sounds, latest OS, good condition, one owner from new, £580 ono. **01354 695239**

YAMAHA SY85 workstation, stand, memory expansion card, sounds on disk, 16 virtual tracks, very versatile instrument, £500. **01628 531477** (Berkshire)

YAMAHA SY85, loads of sample disks, 64K memory card, stand, pedal and manuals, cost £1200, will sell for £500 ono. **Andy** 01733 253288 (Peterborough)

YAMAHA SY85 (w/ stand, as new, £500, Emu Vintage Keys, hardly used, £400, Akai S3000XL, 32Mb with library, £800, Alessi D4, £150, Alessi Microverb 3, £80. **01727 831996** (Herts)

YAMAHA TG33, £250, Yamaha TX812, £150, Yamaha MT8X 8-track recorder, £500, Studiomaster 16-channel mixer, £250, Alessi D4 drum machine, £150, all items ono. **Steve** 0151 475 0395 (Liverpool)

YAMAHA TX7 module, £100, wood and metal racks for 16 19-inch units, £50, old 286 PC, £40, buyer collects. **0191 584 4141** (Near Durham)

YAMAHA TX816 rarely available 80s industry standard, equals eight DX7s, fat layers, rich detunes, collect in London, £800. **0064 9 377 9691** or Fax 0064 9 376 0495 (New Zealand)

RECORDING

ACOUSTIC 3311 studio monitors, 12-inch subs, 5-inch mids, 3-inch tweeters, 2 frequency controls, mint condition, boxed, must sell, cost £1900, will sell for £900, no offers. **0802 441780** (Bucks)

ACOUSTIC 3311 125 Watt monitors, 12-inch woofers, 5-inch mids, 3-inch tweeters, circuit protection and frequency controls, brand new, still packaged, price negotiable. **Jon** 01509 213 966

ACOUSTIC 3311 studio monitors, brand new, 12-inch poly-woofers, 5-inch mids, 3-inch tweeters, frequency controls, 2 years warranty, cost £1800, will sell for £1000. **0117 942 0680** (Bristol)

AIWA XDS260 DAT recorder, 5 tapes included, £200, PZM microphone, hardly used, £20, Digital orchestrator, MIDI/audio sequencer, boxed, £35. **Steve** 01827 703562 (Staffs)

AIWA PORTABLE DAT recorder, power supply, mini remote control, needs some attention hence £80. **01293 454916/0378 641400** (Surrey)

AKAI DR4d MIDI, 1Gb, £500, Soundcraft Spirit Studio 16, £750, Yamaha QY70, £350, Quadraverb, £150, Zoom 1204, £100, Symetrix SX206 compressor/limiter, £100, Lamy 50 Watt combo keyboard amp, £150. **George** 01684 274034 (Gloucestershire)

AKAI DR4d 4-track hard disk recorder, 500Mb with MIDI and SMPTE cards, hardly used, £650, Sansui MR6 six-track cassette recording deck, boxed as new, £225. **01202 427901** (Dorset)

AKAI S2000 sampler, in very good condition, 8 separate outs, 18Mb RAM and 300Mb of sounds, £500 ono, Roland AX1 neck controller keyboard, red, quick sale, £150. **Clifford** 0171 460 6401

AKAI 2800 digital sampler, effects, graphics, Waveform display, separate outputs, unexpanded, 2Mb memory, very little use, immaculate, rack-bag, £500. **0121 601 8591** (West Midlands)

AKG 414B ULS microphone, industry standard, superb quality, £400 ono. **01293 454916/0378 641400** (Surrey)

ALESIS ADAT 8-track digital recorder, 8 hours use, £900, Alessi BRC control unit, not used, £495, both items in mint condition. **Steve** 01492 572614 (Conwy)

ALESIS ADAT machines, low mileage, 600 hours, EDAC 8-way cable loom and remote, £875. **01865 776587** (Oxford)

ALESIS ADAT, £850, AKG C3000, £170. **Ian** 01291 623693 (Gwent)

ALESIS ADAT v4.03 8-way loom and LRC

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controller, £850. Studiomaster 28.8: 16.2 Series 11 desk, lightcase, £395 ono. \rightarrow Jon 01255 22057 (West Midlands)

ALESIS ADAT XT boxed, home use only, hardly used, as new with remote and blank tapes, offers over £1000. \rightarrow 01925 740335 (Cheshire)

ALESIS ADAT XT brand new, low hours home use only, boxed, manual, £950. Behringer De-noiser, two-channel noise suppression, £75. Boss CS-50 single channel compressor, boxed with manuals, £50. \rightarrow Rob 01403 272698 (Hertfordshire)

ALESIS MEQ230 graphic EQ, 2 channels, 30 bands per channel, very accurate tone, £100. Lexicon LXP1 reverb unit, £240 or with rack tray for £250. JI Cooper PPS100 SMPTE/MTC sync, £100. LA Audio MIDI mixer, 19-in rack rackmount, 32 channels of MIDI routing, £240. Behringer Ultraflex stereo enhancer, all items with boxes, manuals and in immaculate condition. \rightarrow Jon 0121 249 0598 (Birmingham)

ALESIS MICROGATE and Alesis Multi Limiter for sale, boxed, manuals, power supplies, as new, £40 each or £75 for the pair. \rightarrow 01260 274030 (Cheshire)

ALESIS MIDIVERB II, as new condition, boxed with manuals, £70. \rightarrow 01483 456163 (Surrey)

ALESIS QUAVERB PLUS effects unit, £190. Midram 4x4x PC, MIDI interface card, £160. Quantum 540Mb hard drive plus DMA to SCSI lead, suit Atari, £180. Roland U11C card, £25 each. Adaptive 2940 ultra PC SCSI card, £120. \rightarrow 0181 902 9784 (Middlesex)

ALESIS RA100 power amp, 100 Watt per channel, £120. Studio Spares 20U rack cabinet, £75. 44-way patch panel, quarter-inch jacks, £25. 15 Banham patch cords, £25 each. \rightarrow Oliver 01425 276040 (Dorset)

ALESIS 16:2:2 mixer with mic, £350. \rightarrow Chat 01223 524837 (Cambs)

ALESIS X2 24-channel recording console, built-in 24 B 2 meter bridge, 8 aux, MIDI mixer, 4-band parametric and splitable EQ, big disk. £3000. \rightarrow Trevor 01462 684382 (Herts)

ALLEN & HEATH GS1 16-channel, 5 Aus, 8 subgroups, sweet mid, MIDI muting, immaculate condition, £425. \rightarrow 01452 720381 (Gloucester)

ALLEN & HEATH GS3 16:8:4 mixer with 16 extra tape inputs, Korg DV2000 reverb, ART LX reverb, Tascam DA20 DAT machine, all items in mint condition with manuals. \rightarrow Andy 0191 285 8293 (Westchester)

ALLEN & HEATH SABRE plus, mixer, 24 16:2, in good condition, home use only, 40 channels, EQ and MIDI mixer on midbay, £2900. swaps and part-exchanges considered. \rightarrow 01624 586818 (Northampton)

AUDIO TECHNOLOGY 8812 pro studio monitors, linear phase, 12-inch woofers, 3-inch mids, three 7-inch tweeters, £1000. \rightarrow Jason 0117 942 5046 (Bristol)

BEHRINGER MX8000 with stand, mint, £750. Focusrite 16 with looms, in very good condition, £1225. (DA20) DAT, Hardly used, £350. Studio Quad, mint, £180. BBE 762, £120. XR8000, £100. \rightarrow 01278 782249 (Somerset)

BEHRINGER EURODESK MX8000 mixer, Summit amp and Alesis Monitor One, £1000 ono. \rightarrow Jon 0131 447 6144 (Edinburgh)

BEHRINGER MX8000, meterbridge, £700. Alesis A11, £200. TEAC 2440, £90. TEAC 6.4 desk, £50. Revox A77, £50. Korg Poly 61, £100. \rightarrow 01865 484983 (Oxford)

BEYERDYNAMIC TGX80, £120. Beyer TGX20, £65. AKG C400B, £30. Stramp Echo 7000 phaser/eq, £80. Kawai MM16 MIDI mixer, £100. \rightarrow John 0115 924 2088 (Nottingham)

BOSS SE70 and Boss SE50, both boxed with manuals, in very good condition, £395 and £195. Yamaha Rev 7 with manual, very good condition, £250. Marshall JMP1 including foot controller, in very good condition, £250. \rightarrow 01226 791450 (New Barnley)

BSS DPR502 dynamic MIDI gate with ADE, lots of many features to list, top-of-the-range model, cost £950, will sell for £350. Tammy Arden loudspeakers, wood cabinets, dual concentric, 15-inch, good condition, £700. Drawmer DS301 MIDI gate, same spec as DS201 but with more MIDI, £300. Lexicon LXP1, £250. LXP5 multi-effects, £250. LXP15, £500. \rightarrow Paul 01535 945233 (Yorkshire)

DENON DRW 580 twin tape deck, boxed with manuals, £100. RMK6 rack kit for the above, using 4U spaces, £20. \rightarrow 01708 523469 (Essex)

DIGITECH STUDIO VOCALIST, £549. Fostek FD4, £349. Roland hp hip expansion, £199. Emu E54000, 16Mb, external, £-ROM, Digitech Vocalist Performer, new, £299. \rightarrow 0973 325822

DIGITECH VOCALIST PERFORMER, harmony and stereo reverb, home use only, in very good condition, £230. \rightarrow 01222 405172 (Cardiff)

EMS 2000, made in the '70s, as used by Hebe Hancock, can be seen and demonstrated in the West End, £1500. \rightarrow 0181 467 0754 (Cheshire)

ENSONIQ DP4, home use only, £50. Korg 01W FD, with home use only, £850, will sell both together for £1300. \rightarrow Ben 01306 631984 (Surrey)

8810 LINEAR PHASE studio monitors, boxed,

brand new, cost £1800, unwanted gift, will accept £1200 ono. \rightarrow Enzo 01273 222056 (Herts)

8810 LINEAR PHASE monitors, 12-inch woofers, 5-inch mid range, 3-inch tweeter, 2 frequency controls, 125 Watts, new, boxed, warranty, £1700 ono. \rightarrow Andy 0171 241 6560

8810 LINEAR PHASE studio monitors, 12-inch woofers, 5-inch mid-range, 3-inch tweeters, parametric circuit protection, 2 frequency controls, boxed, as new, £1400 ono. \rightarrow Rob 0114 222 9999 (Sheffield)

8812 LINEAR PHASE SPEAKERS, 125 Watts, 2 year warranty, unused, boxed, £500 for the pair, ono. \rightarrow Chris 0161 257 5308 (Manchester)

FOSTEX B16 analogue half-inch multitrack, recent service, looms, tapes, manuals, £850. Studiomaster Pro Line 16:8:16:2 plus 8-channel Midrammer. Good extension, MIDI matrix, phantom powering, manuals, £850. \rightarrow Ade 01684 573252 (Wiltshire)

FOSTEX DCM100 and Mixtab digitally controlled mixer, £299. Roland Dep3 multi-effects unit, £199, both items in very good condition. \rightarrow 07801 677130 (Bucks)

FOSTEX DMT8, U220, Wavestation SR, VHS/casset data filer, Yamaha TG100, Boss ME30, Phonic compressor, Akai graphic mixer, audio speakers. \rightarrow 01256 462808

FOSTEX DMT8VL digital multi-track recorder, 16-bit non-compressed audio, full editing, MIDI sync capabilities, a studio in a box, mint condition, boxed, £480 ono. \rightarrow 0181 981 2556

FOSTEX DMT8VL as new, boxed with instructions, bought for £825, yours for £580. \rightarrow Jon 01302 369834 (Doncaster)

FOSTEX D90 unused, boxed, under guarantee, includes 3.2 drive, £100. \rightarrow 0181 542 9940

FOSTEX D160 hard disk recorder with 3.6Gb hard drive, £1050 ono. Korg 1689C Scouting digital mixer, £525. ADAT XT, £1200 ono. Emac II sampler, £450. Korg X5D, £350 ono. SyQuest E2 135 drive, £75. SyQuest cartridge £8. \rightarrow 01274 817317 (Bradford)

FOSTEX E16 private use, service manual, £650. Revox B77 MII, private use, £300. \rightarrow 0191 478 2187 (Gloucestershire)

FOSTEX G16A half-inch tapes, looms, mint. Studiomaster Series 2, 24 16:2 mixer. Akai S1000 hard drive, 40Mb drive, disks, Roland RBM drum module, soundcards, Atan 1040 ST, Cubase vs, SM124 monitor, Timeclock, boxed, manuals, home use only, all mint, £2995 ono. \rightarrow 0141 883 2610/812 0970 (Herefordshire)

FOSTEX G16S mint, Studiomaster Trackmax 24, 32 12:24:2, mint, £3000. \rightarrow 33 142 51 11 89 (Paris)

FOSTEX G24S multi-track recorder, mint condition, £2500. boxed with manuals, home use only, Soundtracs Mega desk, 36 channels, £1500. \rightarrow George 01642 829598 (Middleborough)

FOSTEX MODEL 80 8-track, excellent condition, £350. JI Cooper PPS100 sync box, £100 or £400 for the mixer, will deliver in Bristol area. \rightarrow 0117 944 2254

FOSTEX R8 remote extension, de-mag tapes, boxed with manuals, home use only, £550 ono. \rightarrow 01683 221263 (Dumfrieshire)

FOSTEX R8, £400, 350 mixer, £80. Behringer MX8000 Eurodesk, £800, Yamaha G2030 graphic, £250. Atan 1040 with monitor, £160. Akai 811b board for S3000, £120. \rightarrow Tim 01923 367733

FOSTEX R8 twin reel 8-track recorder, excellent condition, recent service and line-up, sounds great, £575 ono. Jomvec VCC3 Pro Channel, superb mic preamp/compressor/enhancer combo with phantom power, little used, boxed, manual, mint, with PSU, superb sound, add magic to your vocals, £130. \rightarrow 01354 695239

FOSTEX R8 MTC, footswitch, looms, 6x reels, £450. Fostek B12 mixer, MIDI muting, £400, both in excellent condition, with boxes and manuals. \rightarrow 0121 743 9054 (Chicks)

FOSTEX R8 multitrack 4 track, 8 inputs, high speed, Dolly C, full EQ, good condition, boxed with manual, £250 ono. Art Proverb 200 multi-effects processor, rackmount, £100 ono. \rightarrow 01829 770107 (Cheshire)

FOSTEX 28 multitrack, high-level Dolly C, eight inputs, excellent condition, £320 ono. \rightarrow 01778 348330 (Peterborough)

FOSTEX 4030 sync unit and remote, £250. Biff B20 fanger, the classic, £500 ono. \rightarrow Gary 01869 810936 (Oxon)

KLARK TEKNIK Jade MkII active 2-way mid-field monitors in good working order, cost over £1200, sell for £600, very accurate and adequately loud. \rightarrow Paul 01684 561397 or email paul.whiteson@compuserve.com (West Midlands)

KORG A1 high-grade flexible multi-effects, lots of knobs, £450. Sony DPM7, £390. Digitech DSP256 multi-effects, £130. Peavey PC1600X 16-voice MIDI controller, £275. \rightarrow 0181 783 0537

KORG DB 8-track digital recorder with effects, 7 months old, in very good condition, home use only, £575, Roland PMA5 module recorder, £300. \rightarrow Tony 01222 405172

KORG SDB3300 triple digital delay, bowed, sampling option, bar-graph display, MIDI, programmable memories, £150. Yamaha DBX50 PC dithering board, £50. Akai 9900 sampler with library, £250. \rightarrow 01268 525347 (Essex)

LEXICON ALEX effects, £150. Akai CD3000 sampler with loads of samples, £1200. Korg 01W FD with flight-case, £850. Peavey 12-channel deck, £250. Shure S58S mic, £50. \rightarrow 01473 401043 (Suffolk)

LEXICON REFLEX effects unit, £100. Emsiq DP2 effects, £175. Digitech Studio Quad v2 effects, £175. All items boxed with manuals, in pristine condition. \rightarrow Tony (after 6pm) 01473 685573 (Ipswich)

MACKIE CR1604 mixer, 16 channels, great EQ, 6 aux sends, boxed as new, hardly used, all manuals, £350 ono. \rightarrow 01483 456163 (Surrey)

MACKIE CR1604 mixer, 16 inputs, two stereo outs, great EQ, 6 aux sends, insert points, multitrack possible, rack ears and optional Rotopod for rotating jackfield to most convenient position, boxed, manual, good condition, sounds great, one owner from new, £485 ono. Not. repeat not, VLZ version. \rightarrow 01354 695239

MARANTZ DCB2 DCC recorder, tapes, manual, remote, £125. BBE462 SCSI max/mixer, £120. SyQuest 44Mb, SCSI removable drive, 6 cartridges, £125. \rightarrow Dave 0115 933 7354 (Nottingham)

MARANTZ PROFESSIONAL CD portable stereo tape recorder with low-noise balanced mic amps, Nicad battery pack, carry case and several new tapes, virtually unused, cost £650, will accept £280, great for location recording. \rightarrow Paul 01684 561397 or email paul.whiteson@compuserve.com

MOOG 3-BAND parametric EQ with overdrive, very rare, £450. Fostek D80 with expandor drive, £700. Mackie 1104 VLZ, £595. Roland R8, £240. \rightarrow 0141 334 4452 (Glasgow)

MXR STEREO rackmount compressor/limiter, in immaculate condition, owned from new, beautiful sounding classic vintage compressor, at a give-away price of £275. \rightarrow 01482 348 767 (East Yorkshire)

PEAVEY MONITORS £200 pair of C Audio 400 Watt stereo amps, £280. Inkel Graphic EQ, 15-band per channel, £80. EMS flight-case trolley, 12U, £180. \rightarrow (after 6pm) 01455 613401 (Hockley)

PHILIPS CDC730 box and manuals, £135 plus rack adaptor if required. \rightarrow 01993 700295/01703 511138 (Oxon)

PHILIPS CDR870 compact disc recorder, can also use cheap computer blanks, hardly used, £240. \rightarrow 01963 467608 (Northants)

REVOX C278 half-inch 8-track reel-to-reel including all looms and 9 reels of quality tape, mint condition, £1050 ono. \rightarrow 01274 610984/07887 567415 (Bradford)

RODE NT1, £150, An Levlar, £75. Art Tube mic preamp, £75. Sony TCD DB portable DAT, £275. Fostek XR3 4-track, £120. \rightarrow 01782 209991/01270 872167 (Staffs)

RODE NT2 microphone, hardly used, £300. \rightarrow 01749 673464/0385 297771 (Somerset)

ROLAND VS880, hardly used, £975, SCI Pro One, in very good condition, £350, Korg V10 Vocoder, £300, Synthcho TeeBee, 4 CV pitch Mk3, cost £650, will sell for £300. \rightarrow 0191 240 3933 (Newcastle)

ROLAND VS880 V-EXPANDED digital multitrack recorder, 1.4Gb hard drive, VSB1 effects board, excellent condition, tutorial video, padded carry case, manuals, £1000. \rightarrow Richard 01920 863580/01992 461332 (Herts)

ROLAND VS880 V-expanded digital multi-track recorder, internal hard drive, effects board, complete tutorial video, immaculate, boxed, £1000. \rightarrow 0121 601 8591 (West Midlands)

ROLAND VS880 V-Expanded 8-track digital workstation, boxed, immaculate condition, used twice, complete with effects board, manuals, £975. \rightarrow 01908 503086 (Bucks)

ROLAND VS1680, boxed, mint condition, 16-track 24-bit digital recorder with effects, £1850, Simmons 8-channel digital mixer, single unit, rack mounting, £150 ono. \rightarrow 01702 616961 (Sunderland)

ROLAND VS1680 16-track digital studio workstation, 2 built-in stereo effects processors, 2Gb internal drive, full MIDI sync, digital desk, £1750. Sony DAT recorder with digital input, 32kHz, 44.1kHz and 48kHz sample rates, full remote control, £200. \rightarrow 0966 529001 (Dorset)

ROLAND XP50, Korg M1R with cards, £400. Emu Proteus 1, £125. \rightarrow Pip 0181 998 8623

SANSUI MR6 classic 6-track cassette recorder, 3U rack mount, bounces in stereo, recent full service, sonically and operationally as good as new, double level, wrapped, Dolly C, sync track, great condition, box, manual, excellent sound, £300 ono. \rightarrow 01354 695239

SANSUI WX16 6-track, 8-channel mixer, £300, Korg DiPi vocoder/harmoniser, £325, Evolution sound module, £175, Midram SmartSync, £45. \rightarrow 01926 865390 (Wiltshire)

SESSIONMASTER GUITAR recording preamp, rack mounting overdrive plus classic amp EQ

and speaker simulator, £75. \rightarrow Paul 01684 561397 or email Paul.whiteson@compuserve.com (West Midlands)

SHARP CD numeric, radio, 3D surround-sound digital recording master system, MDI X7H model, brand new, still boxed, unwanted price, £250 ono. \rightarrow (after 6pm) 01492 622396 (Conway)

SONY A6 DAT recorder, hardly used, £375, Digitech Vocalist workstation, boxed as new, £395. SPL Vitaliser, £150. \rightarrow Andy 01992 560341 (Essex)

SONY MDMX4 digital 4-track recorder, full editing and MIDI sync capabilities, built-in mixer, immaculate, boxed with full instruction manual, 2 months warranty, first to sell will buy £300. \rightarrow Ashley 01628 627965

SONY WDM6C professional Walkman with external ELM909 Sony microphone and adaptor, as new, still boxed, cost £440, offers please. \rightarrow Lucy 01487 343139 (Hull)

SOUNDCRAFT SPIRIT FLO mixer, 12.2 bus, treble, sweep mid, pan, gain, jacks to XLR, £180. Yamaha TX802 16-voice multitrack tone generator, classic DX7 sound, good condition. \rightarrow Steve 01755 564405/01344 778583 (Berks)

SOUNDCRAFT SPIRIT LIVE digital 16-channel line mixer, £880, Akai 5950, fully expanded, £500. Midverb II, £150. Roland Juno 1, £180. Yamaha DX100, £125. Atari STE, monitor, £150. Sony TCD portable DAT recorder, £250. \rightarrow 01423 266934 (Herts) (Yorkshire)

SOUNDCRAFT SPIRIT STUDIO LC 24 B 2, unrecorded project, never used, still wrapped and boxed, £1100. \rightarrow Dannie 01908 838543/04325 551840 (Wolverhampton)

SOUNDCRAFT 2008 disk, offers, £1000, 10Mb, new screen, 300Mb drive, £750, U220, £180. TR808, £380. JBL 4312 monitors, £400. Crown D300A amp, £400. TC2240 Parametric EQ, £270. Sound Designer II system with Mac II, £400. more items, all serviced, immaculate. \rightarrow 0171 385 6171 (West Kenting)

SOUNDCRAFT 2400 mixing desk, 24 24 24 and Soundcraft 760 Mk2, 24-track 2-inch tape machine with remote, both in good working order, £3525 ono. \rightarrow 0181 211 8822

SOUNDRACRS MIDI PC 24 channels, 56 inputs on mixer 8 effect returns, 4 aux, full loom and patchbay, \rightarrow EMU, £1050 ono. Aless DA, £200 ono. \rightarrow Geoff 0181 537 9128/0956 224058 (Harrow)

SOUNDRACRS PROJECT 8 mixing desk, 24 B 2 with meter bridge, as new, £1195, Yamaha QY10 MIDI sequencer, manuals, £119. \rightarrow Dorna 01323 736017/01771 628463 (East Sussex)

SOUNDRACRS TOPAZ 24 48 B 2, meterbridge, stand, £1200. bass bins 200 Watts, £150. Atari 1040, monitor, Cubase v3, with cartidge, £230. Revox A77, £275. treck reel-to-reel, £180, Tascam Porta 05 4 track, £220, excellent condition. \rightarrow 01263 515799 (Norfolk)

SPIRIT F1142 mixer, £200 ono. Casio FZ1000 synth, £100. Yamaha S1600 soundcard. \rightarrow Leroy 01283 564888 (Suffordshire)

SPIRIT STUDIO 24-channel desk, £1100. Tascam DA20, £390. Behringer stereo de-noiser, £125. Behringer Vitalizer, £125. Aphex C2 exciter, £125. 3-head Sony cassette, £150, whole lot for £2000. \rightarrow Oliver 0114 288 2236 (Sufford)

SPL STEREO VITALIZER, black face pro model with stereo with expander, jack connections, absolutely as new, £195. \rightarrow Paul on 01684 561397 or email paul.whiteson@compuserve.com (West Midlands)

STUDER 3-BAND 7-channel EQ unit, seven on each band, highest quality EQ unit, mint anorak stuff, £1500 ono. \rightarrow Ian 01582 504994 (Beds)

STUDIOMASTER 16:8:16:2, Pro-line gold with MIDI muting, comprehensive features, good condition, manual, £600. JBL Control Five and sub bass, amp, stands and leads, £300. \rightarrow 01793 533993 (Swindon)

STUDIOMASTER MIXDOWN 16:8 16:2, in very good condition, manual, £250 ono. TEAC two-track quarter-inch tape machine, £95 for quick sale. \rightarrow 01623 950885 (Kent)

STUDIOMASTER PROLINE GOLD 24 16 2, 40 inputs on midbay with full MIDI mutes, customised with leather arm rest along the front edge, comes with Atan Cubase 1040, £650. \rightarrow Shaun 01782 563149

STUDIOMASTER SERIES 5 16 channel desk, expanded to 32 B-buss, £450 ono. \rightarrow 0181 555 4826

STUDIOMASTER TRACKMIX 24 12 24 2, £1500. Fostek B16, looms, £600. Alesis D4, £120. RA100, £200. Quadvraver upgrade, £120. Yamaha NS10M, £100. Marshall JCM900, £250, all items in perfect condition. \rightarrow 01324 563428 (Stratford-on-Avon)

TANNOY DMT10 MKII studio mid-field monitors, stunning accuracy and stereo image, 350 Watts, extremely powerful monitoring at under half price, £495. \rightarrow Chris 01785 919929 (Staffs)

TASCAM DA20 DAT, one year old, only used for two weeks, £375, XR300 MIDI tape sync, mint, £100. \rightarrow Rob 01844 217833 (Oxon)

TASCAM MM1 20:2 rack mixer, £225, box of over 100 mono leads, £100, Each computer speakers, £10. \rightarrow Carl 01507 606956 (Lincs)

TASCAM M2516 16:8:2 desk, EQ, MIDI mutes,

pristine condition, must be seen, home use only, £280. \rightarrow 0181 257 0172

TASCAM MS24 mixer with remote, in good condition, home use only, £3500, will consider part-exchange or swaps. \rightarrow 01604 586618 (Northampton)

TASCAM MSR245 multitrack analogue, Dolby S, remote, trolley, £2800, Mackie 32 B with stand, speaker shelf and mixer bridge, £2500. Simmons 1502 mixer, £120, ibx 296, £120. \rightarrow Alan 0171 627 2585

TASCAM PE120 professional microphones, two for sale, boxed, £50 for the pair, 8 years of the magazine Studio Recorder, offers issue from number one listed in HR brides, every issue. \rightarrow 01260 274030 (Cheshire)

TASCAM 38 half-inch 8-track, mint condition, home use only, abse noise reduction, XRI synthesizer plus 10 reels of Ampex tape (used once). \rightarrow Richard 0114 287 5648 (Sheffield)

TASCAM 38 half-inch 8-track, abse noise reduction units and loads of tape, all in good condition, £650 ono. \rightarrow Dave 0161 706 9764 (Salford)

TASCAM 2385 Syncassette 8 track with Dolby S and MIDI remote control interface for integration with a sequencer, low hours, serviced by Tascam, fully featured professional studio machine, rack mountable, 3U, immaculate, original box and manuals, £850. \rightarrow Andrew 01312 464538 (Surrey)

ROLAND 388 light rack, reel-to-reel 8-track in-line mixer, mists, dbe noise reduction, manuals and 16 reels of tape, immaculate condition, £550



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Roland SP808 Inc. Expansion Board	£749
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Roland R8 Drum Machine	£349
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ROLAND MT100 4-track digital sequencer/sound module, disk drive, hundreds of sounds, manual, PSU, flightcase, absolutely immaculate, will sell or exchange for Yamaha QY20. ☎ 01639 768103 (South Wales).
ROLAND TB303 including carrycase, manual and power supply unit, original, good condition, £570. ☎ 01582 699674/614016 (Beds).

SAMPLERS

AKAI CD3000 sampler, 16Mb memory, 10 outputs, £550 Ensoniq SD1 workstation keyboard, £400, both in excellent condition and with manuals. ☎ 01634 232739 (Kent).

AKAI CD3000XL, 32Mb, as new, quick sale, £850. ☎ 0411 979424/01223 36212 (Camps).
AKAI S950 great condition, fully expanded, eight outputs, genuine reason for sale, perfect first sampler, disks available. £525. ☎ Dan 0115 947 6441 (Nottinghamshire).

AKAI S1000 box manual, SCSI, official 3CD library, only 2Mb hence £450, one. ☎ John 0181 505 6782 (Essex).

AKAI S2800, 2Mb, v2.0 software, effects, 10 CDs, £775, Spirit RacPac mixing desk, £300. Alzin 1040 STE, 4Mb, monitor, Cubase tutorial, £265, all items in mint condition. ☎ 0802 441780 (Bucks).

AKAI S3000i, 8Mb, 10 outputs, digital I/O, SCSI, 50 internal effects, 540Mb hard drive, boxed, £1150, Akai S3000, 8Mb board, £150, Akai 304F hard disk recording/2nd LSI board, £200. Arcade Studio 4 MIDI interface, £250. ☎ 0181 902 9784 (Middlesex).

AKAI S3000XL, 32Mb, £300, effects board fitted, SCSI, 10 outputs, as new, still under guarantee. £1200. ☎ Simon 0181 599 4668.
CHEETAH SX16 16-bit stereo sampler, multitrack, 8 outputs, £200, Akai X8B 16-bit drum expander, 8 outputs, mint, £100, Korg DDD5 drum machine, £100 ono. ☎ Mark 0181 746 9756/0118 984 3279 (Reading).

EMU E512 sampler with SCSI interface, Seagate E2 Flyer, 230Mb zip drive, both as new, hardly used, £600. ☎ Steve 01492 572614 (Conway).

EMU E532 sampler, SCSI fitted, 8Mb RAM and 12-speed CD-ROM drive with 3 CD-ROMs, all boxed, £700. ☎ Dave (after 6pm) 01738 636391/07801 257970 (Perin).

EMU E532, 32Mb, SCSI, v1.1, Falcon 14Mb IDE, zip drives, NVDI, hard disk, Gibraltar, Roland AB80, all items in excellent condition, studio upgrading, offers. ☎ Michael 01271 862801 (Devon).

EMU E514000 sampler, 20Mb memory, expandable to 128Mb, 64-voice polyphony, 16 filter types, mint condition, boxed, £750. Yamaha CS1X keyboard, mint, £295, Composer, £100. ☎ 0121 554 8067/0958 287231 (Birmingham).

EMU E532 memory expansion, 32Mb, new, £60 including postage. Roland JV expansion board wanted, or swap/part-exchange for memory. ☎ Alan (between 6pm & 8pm) 01942 749868 (Cheshire).

EMU E514000 turbo, full 32Mb upgrade, brand new, boxed and unused. ☎ Joe 0171 613 3865.

EMU E-SYNTH dance sampler, E4K sampler, 2000 internal sounds, Planet Phat/Orbit, 128-note poly, 24-bit effects, resample, 76 keys, semi-weighted keyboard, 64 filters, 2 months old, cost £3300, will sell for £2400. ☎ 01903 215795 (Sussex).

ENSONIQ EPS16+ turbo rack sampler, £520, early VxL, £320, many SOS magazines and other recording, bass and guitar publications. ☎ 01702 312748 (Essex).

PEAVEY SP/SSL sampler, 8Mb, SCSI zip drive, lots of disks, boxed manuals, perfect condition, £500. ☎ Rob 01403 272098 (Horsman).

ROLAND JS30, 4Mb, £260, Akai Remix 16, £299, Fatar 88-note keyboard, £310, Qusam di Technos, £290, Korg N5, £450, Peavey MIDI streamer, £90. ☎ 01261 815707 (Banff).

ROLAND MC303 good condition, manual, £350. Casio CT1000, very good condition, manual, £100. ☎ John 01507 605087 (Lincs).

ROLAND S50 sampling keyboard, large sound library, connection to RGB monitor, £300, Yamaha QX1 sequencer, 8 individual outputs, £90, Boosey and Hawkes tenor saxophone, silver, £250. ☎ 01202 695869 (Dorset).

ROLAND SP808 groove sampler, £750, Ensoniq ASR10 rack, £950, Clavia Nord Rack 1, £600, all items come with a manual and delivery charge included. ☎ 065 458 1346 or email deskjet100@yahoo.com (Singapore).

ROLAND SP808, mint, £600, TC Spatial Expander, £400, TC 2240 stereo parametric, £325, Yamaha A3000 sampler, £650, AKG Control Tube mic, £425. ☎ 0121 422 9605

(Birmingham).
ROLAND SP808 unused, genuine reason for sale, zip disks, £875, Peavey mapper, £50. ☎ 0468 647432/0118 924 5256 (Bristol).

ROLAND S760 sampler, 18Mb, CD-ROM, zip cartridge and digital expansion, Sony monitor, sample library, immaculate condition, £1500. ☎ Tg 0181 883 0258.

SIMMONS SDX sampling workstation, 9-inch screen, tracker ball, 16 analogue VCFs and VCAs, superb sound, Dynamics internal hard drive, 16 outputs, £1500. ☎ 0181 783 0537.

YAMAHA A3000, 32Mb, boxed as new, 18 months old, warranty, sale due to emigration hence £550, will throw in an Atari ST. ☎ Marc 01285 715355 (Stafford).

YAMAHA A3000 sampler with 4Mb upgrade fitted, 2 1Gb hard disk, CD-ROM drive, 8Mb memory fitted, £600 ono. ☎ 01455 611479 (Leicestershire).

DRUM MACHINES

ALESIS D4 drum module, £180, Zoom 1202, £100, Art Multiverb, £80, 500 Watt powered 12-channel desk, £300, all prices ono. ☎ (before 7pm) 01803 851101 (Devon).

ALESIS SR16, perfect condition, used twice, boxed manuals, leads, £120. ☎ Sandro 0181 692 9912/0958 755128.

BOSS DR550 DR Rhythm, drum machine, 16-bit dynamic range, 48 sounds, 64 presets, 64 programmable patterns, MIDI sync, good condition, boxed with manual, £100 ono. ☎ 01829 770107 (Cheshire).

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ROLAND RB with jazz card and electronic card (808), £250 ono. ☎ 0113 275 1267 (Leeds).

ROLAND RBM, very good condition, boxed with manuals, home use only, £275 ono. ☎ 01933 678608 (Norhamts).

ROLAND RB MkII drum machine, mint 808 and 909 sounds, manual, boxed, £499, Yamaha RY30 drum machine with rare dance card, manual, £299, SYV/TC and 5577 cards. ☎ 01708 250846 (Essex).

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YAMAHA RY30 boxed, manuals, cards, excellent condition, £220, Yamaha TXB12, manual, £110, Yamaha TG100 manuals, good condition, £120. ☎ Neil (after 6pm) 01603 624987 (Norfolk).

YAMAHA RY30, £200, Boss DR110, £100, 32Mb RAM for A3000, £45, Amiga A600, 2Mb, lots of other music items, £130, will swap any of the above for a TB303, PMAs or other. ☎ Darren 01375 400048 (Essex).

YAMAHA RY30, £200, Boss DR110, £100, 32Mb RAM for A3000, £45, Amiga A600, 2Mb, lots of other music items, £130, will swap any of the above for a TB303, PMAs or other. ☎ Darren 01375 400048 (Essex).

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AMIGA 1200 with Atari colour stereo monitor, £75, no offers, Techno Toolbox sampling CD, £20, 12U rack box, £20, no offers, everything in mint condition. ☎ Andy 01253 890048 (Lincs).

APPLEMAC 7600 PPC 64/1 2Gb, 6XCD, monitor, keyboard, VST, Time Bandit, Recycle, Waves, Peak, Hyperstrip, Autotune, Red Wave, £1300, Roland PMAs portable GS unit, £230, Volt studio speakers, £400, Amcron amp, £130. ☎ (after 2pm) 01924 216047.

APPLE MAC LCII with mono monitor, keyboard and mouse, absolutely fine for MIDI but too slow for audio. Complete with Logic Discovery, £250. ☎ Paul 01684 561397 or

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ATARI MEGA ST2, SM124 monitor, Cubase v3.0, digital, all boxed manual, £250 for the lot. ☎ Malcolm 0141 339 1945 (Glasgow).

ATARI SETUP, 4Mb STE, SMF24, 350Mb hard disk, SM124 monitor, TOS 2.06, high density internal and external drives, Cubase, Logic, Notator, Export, Logic 3, all in perfect condition. ☎ Alex 0976 822652 (Plymouth).

ATARI ST computers, lots of them in very good condition, Cubase, £60 to £70 each, Yamaha TG100, 300 sounds, £140, Atari high-res monitor, needs attention, £20, medium-res, £35. ☎ Chester 01244 546393 (Burdley).

ATARI STE 4Mb with high resolution monitor, extra MIDI port software, £185, Kawai K1R, £120, Casio CZ101, £100, Yamaha DX7, poor condition, works perfectly, £145. ☎ 0115 938 2468 (Nottingham).

ATARI STE 2Mb with hi-res monitor and extra MIDI out, Cubase v3.0 with dongle and all manuals, £300 for the lot. ☎ 01206 729315 (Chichester).

ATARI 1040 ST, SM124 monitor, 40Mb hard disc, extra floppy drive, Steinberg Pro 24 Steinberg Cubase, Band-in-a-box, Protei Signum games, £200. ☎ 01603 755202.

ATARI 520 STE upgraded with Atari SC1435 colour monitor power drive, printer, MIDI software, music, dust cover, all as new, £100 ono. ☎ 01507 605087 (Lincs).

ATARI 1040 STE, very good condition, mouse, joystick, lots of software, stereo remote controller package, no monitor, £100. ☎ 01843 587088 (Ramsgate).

ATARI 1040 STE, 4Mb external power supply, fan assisted, Atari SM144 monitor, NVDI 2.5 plus a spare 1040 STE, faulty disk drive, lots of software, all in immaculate condition, £180. ☎ 01782 205842.

APPLE POWERMAC 7500/100, 1Gb hard drive, 24Mb RAM, CD-ROM multi-scan 17-inch monitor, keyboard and mouse, excellent condition, £1000 ono. ☎ 01803 615860 (Torquay).

AUDIO HARD DISK RECORDING SYSTEM, Intel Pentium II, 266MHz, BX board, 64Mb SD RAM, 6.4Gb UDMA33 hard disk, drive, 4Mb CD graphics card, AWE64 Gfx, Cubase 5.0, £1000, very warranty, offers. ☎ 0181 922 3318/0956 560596.

C-LAB FALCON, monitor, FAB and FD1 interfaces, Micropolis hard drive, Audio Tracker, hard disk recording software, £500 for the lot. ☎ 01395 223577 (Devon).

CUBASE AUDIO 3.1 for PC, mint condition, boxed, manuals, single never used, £160. ☎ Dominic 0700 123 3999 (London).

CUBASE VST v3.55 PC Windows, registered copy, manuals, £250 ono. ☎ Eugn 0171 487 2700.

DIGIDESIGN AUDIOMEDIA 2, NuBus sound card, use with Sound Designer, Cubase XT, digital and analogue outputs, £250. ☎ 0171 494 0499.

DIGIDESIGN PROTOCOLS 2.5 for NuBus power Mac with 4 channel audio interface. £799, Digidesign Sample Cell 2 for Power Mac, 8Mb with library, £599 ono. ☎ 07801 677130 (Aylesbury).

EMAGIC LOGIC v2.6 for Mac, powerful MIDI sequencer, £200, Gibsonwalk home studio v3 for PC, £50. ☎ Steve 01234 350901 (Bedford).

EVENT GINA digital audio card for PC/Mac, 4 in, 10 out, as new, £375, AWE 64 Gold soundcard as new, £75. ☎ 01702 616961 (Southend).

OPCODE STUDIO VISION for Mac, £150, Digidesign Soundtools DAT I/O for Mac or Atari, £190, Pro Tools 3 bridge I/O NuBus card, adds 8 tracks to core, £300. ☎ 0181 783 0537.

PC MUSIC SYSTEM, 20Mb RAM, 500Mb hard drive, 12XCD ROM, Windows 95, Cubase Score v3, Cakewalk Pro Audio, soundcard, speakers, XGEdi 95, SG01 edit, and more, £260. ☎ 0181 402 1108/04325 531034 (Kent).

PRO TOOLS III (PCI), 16-track core system with 4.1 software and masterizer CD, boxed as new, £2200 ono, Roland PMAs portable MIDI sequencer, £250 ono. ☎ 0171 831 8135/0171 278 0427.

TWO ATARI STs for sale, 1Mb STFM, £80, 4Mb STE with 2-0, 120Mb hard drive, £120, multisync monitor, £120, mono, £75, colour, £50. ☎ Jim 01911 536 2165 (Sunderland).

TERRACE 64XL, very high-quality PC soundcard with digital interface, 64-note polyphony, 6Mb upgradable, 2 MIDI ports, includes Cubase XL, £335 ono. ☎ Mike 0113 275 3743 (Leeds).

PENTIUM 2 ATX 300MHz, MIDI, switchable desktop or tower, SCSI, PCI, Omega Ultra with 2Gb hard disk drive, 24X CD-ROM, 32Mb SD RAM, AGP4Mb, Yamaha sound, keyboard, 14.4, Cubase, AT, Win 95, Modem, new, fast, super quiet, £635. ☎ 01179 904 6512 (London).

TURTLE BEACH PINNACLE soundcard, with 4Mb of sampling RAM, latest drivers, boxed, guarantee, £350 ono. ☎ Glen 01303 253637 (Kent).

YAMAHA D850 boxed with manuals,

excellent condition, £65, Turtle Beach Model sample card with memory, £55. ☎ David 01904 438768 (York).

PERSONNEL

ASIAN KEYBOARDIST seeks co-keyboardist and other musicians to form killer dance group. Influences include The Orb, Prodigy, The Grid, Orbital, Appalo 440, preferably in the Herts area. ☎ 01462 678865 (Herts).

CUBASE VST TUITION, experienced programmer, running v3.5 to 4.0v2 on G3 Mac, available for tuition, based in Manchester. ☎ 0973 498862.

DRUM & BASS musicians wanted, must be experienced, groove programmer/keyboardist with own equipment, drummer/programmer, singer/lyric-writer, all needed for high-quality electronic project (Goldie, Roni Size, Tricky). ☎ Alois 0181 671 4938.

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GOOD QUALITY MUSIC wanted on CD/DVDette for New Age style label project. ☎ 01584 811653 uwork@compuserve.com (Worcester).

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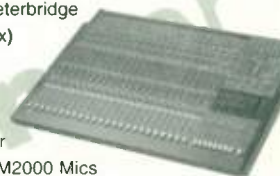
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Web: <http://www.soundslive.co.uk>



Roland G1000

arranger workstation

Prize kindly donated by Roland (UK) Ltd (01792 799644).

Christmas is rapidly approaching, and you're probably thinking fondly of the goodies Santa's going to bring (and wondering how he'll manage to squeeze that new studio setup down the chimney!). The trouble is, no matter how much sherry, mince pie and reindeer food you leave out on Christmas Eve, next morning your stocking only ever seems to contain a pair of socks and a satsuma. This Christmas, though, Roland UK have put on their corporate white beard and red overcoat, and promised one fortunate reader a very special present — a G1000 Arranger Keyboard worth £1999, the covetable prize in our December competition. For a full review of this top-of-the-range product you need only turn to page 148 of this very issue of *Sound On Sound*; if you can't wait, read on!

The G1000 is a development of Roland's popular G800 arranger keyboard, and offers even more controllability, sounds and effects than its predecessor — with a professional 76-note weighted keyboard that is a pleasure to play. Gone are the days when auto-accompaniments and style patterns found on

arrangement keyboards were as flexible than a steel corset and as realistic as Paul Daniels' hairpiece. With its multitude of different style and pattern options which can be accessed, muted, triggered, combined and layered using a huge range of control methods, the G1000 is a truly interactive arrangement tool.

The G1000 uses the new range of high-quality GM/GS sampled sounds found on Roland's top-of-the-range SC880 Sound Canvas. The 1161 samples (known as tones) and the 43 drum sets are the basic building blocks of sound generation in the G1000, and are used to make up the parts in an arrangement. Parts can be treated with vibrato rate, depth and delay, with filter cutoff and resonance and envelope attack, decay and release. The parts, in turn, are combined to create an arrangement, and backing patterns can have up to six arrangement parts plus bass and drums. Styles aren't in short supply either, with 128 available, from traditional waltzes to cutting-edge jungle and swingbeat.

You can exercise complete control over the arrangement using the 'advanced' style setup, which offers a wide range of pattern

variations and fill-in options, or you can opt for a 'basic' arrangement that produces impressive results with a minimum of programming. Variations can be triggered using keyboard aftertouch, external foot controls or from assignable buttons, depending on your preferred working method. 'Dynamic Arrange' allows the auto-accompaniment to adjust its own volume according to how loudly or softly you play in the specified trigger area, giving backing parts more of a 'live' feel. All split/layer texture work is storable in performance memory for future recall, while a chord trigger setting allows selection of pattern memories simply by playing major, minor and seventh chords. The G1000 can even display lyrics, so you'll never forget the words to your songs again! There's also a well-specified 16-track sequencer, ideal for building arrangements from scratch or expanding existing ones, and the G1000 makes a superb MIDI master keyboard.

To stand a chance of winning the G1000, you don't have to queue up at Santa's Grotto or send begging letters to the North Pole — simply answer the questions correctly, fill in the tie-breaker and then post your entry form to the SOS address at the foot of this page. Entries should arrive at the office by **Friday 15th January 1998**.

questions

1. What sort of keyboard is the G1000?

- a. Arranger
- b. Avenger
- c. Prisoner
- d. Danger Man

2. Which of the following is a G1000 arrangement style?

- a. Forest
- b. Jungle
- c. Bungle
- d. Zippy

3. How many tones does the G1000 have?

- a. 1111
- b. 1066
- c. 1961
- d. 1161

tie-breaker

The G1000 provides you with styles for your arrangements. If you could re-arrange just one song so it had a bit more style, what would it be, and why? Answers in no more than 30 well-chosen words please.

.....

.....

.....

.....

Name

Address

Daytime tel. no

Would you like to receive more information on Roland products? If not, please tick this box

Post your completed entry to: **SOS Roland G1000 Competition, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.**

WorldRadioHistory

the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, Roland UK, and their immediate families, are ineligible for entry. 3. No-cash alternative is available in lieu of the stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prize winners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.



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New MIDI Channel Shifter & Filter



The useful new CSF MIDI Channel Shifter and Filter is a

handy MIDI processor unit with a built-in mains power supply. It allows you to selectively pass or reject MIDI messages by channel, or to alter their channel assignments. It also makes it possible to mute a specific message type on a specific channel, or on all channels. MIDI System messages can also be selectively muted.

The front panel carries two rotary switches which combine to select the operating mode for the MIDI processor. The sixteen-position switch is generally used to select a MIDI channel number. A twelve-position switch is then used to select the function.

Eleven MIDI channel processing functions are available, as follows:

- the selected channel retransmitted solo, the rest muted
- the selected channel muted, all others passed
- mute messages on channels above that selected
- mute messages on channels below or equal to selected
- the selected channel solo and shifted to channel one
- shift all channels "round the clock" by selected offset
- pass channel one solo shifted to selected channel
- mute control change messages on selected channel
- mute pitchbend messages on selected channel
- mute program change messages on selected channel
- mute all aftertouch messages on selected channel

The twelfth position is for the *System and Global mode*. When the function switch is in this position the sixteen position switch is available as a sub-function selector. The sixteen *System/Global* sub-functions are:

- 1: bypass (pass all)
- 2: mute all system messages
- 3: mute System Exclusive messages
- 4: mute MIDI Time Code quarter frame messages
- 5: mute Song Select messages
- 6: mute Clocks, Start, Stop and Song Position Pointer
- 7: mute Active Sensing
- 8: mute all channel messages
- 9: mute all notes (on all channels)
- 10: set all note-on velocities to 100
- 11: mute all control change messages
- 12: mute all all-notes-off messages
- 13: mute all pitchbend messages
- 14: mute all program change messages
- 15: mute all aftertouch messages
- 16: retransmit all channel messages on channel one

The CSF is a neat 109mm x 109mm x 40mm. MIDI In, Out and Thru ports are provided and the integral mains lead comes with a plug. An LED power indicator is provided.

CSF MIDI Processor £79.95

1 into 10 MIDI thru box

As your MIDI system grows, you may need a MIDI thru box to deal with devices without MIDI Thru connections, or avoid MIDI timing errors. The convenient *V10* will let your master keyboard, sequencer or other MIDI transmitter drive up to ten receiving devices in a 'star' network.

The *V10* is compact (175mm x 40mm x 45mm) and has a built-in mains power supply with an indicator lamp. The integral mains lead comes with a plug.



V10 MIDI Thru Unit £39.95

Smarter merge units

The compact *Little 2M* and classic *2M* both merge two MIDI sources. The *3M* merges three sources, the *5M* merges five, while the *9M* impressively merges nine! They can handle all types of MIDI data, including *MTC* and *SysEx*. Many automatic features enhance performance and convenience.

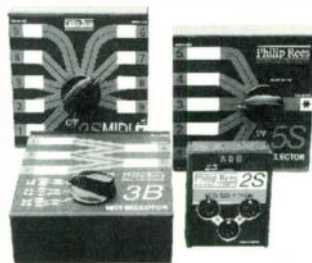


The *Little 2M* is line-powered, so no external power source is needed. The larger *2M* and *3M* have built-in mains power supplies. The superb new high-tech *5M* and *9M* units are supplied with mains adaptors.

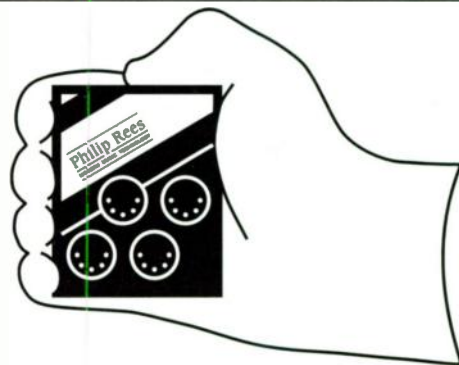
Little 2M MIDI Merge Unit £39.95
 2M MIDI Merge Unit £69.95
 3M MIDI Merge Unit £99.00
 5M MIDI Merge Unit £125.95
 9M MIDI Merge Unit £169.95

Select a selector

These MIDI selectors could solve your MIDI routing problems and save you the inconvenience of swapping cables about



2S MIDI Selector £12.95
 5S MIDI Selector £29.95
 3B MIDI Selector £29.95
 9S MIDI Selector £39.95



Functional simplicity

Talented tape sync

You can use the *TS1* to synchronise your MIDI sequencer to any decent analogue tape machine.



The *TS1* can generate and recognise the usual four SMPTE formats. The *TS1* will convert SMPTE to MIDI Time Code (MTC). Alternatively, you can use the *TS1* by way of its Song Position Pointer/SRT format.

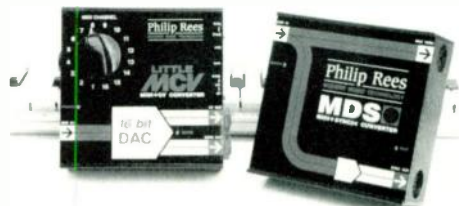
The *TS1* merges MIDI data received with its own sync data. You won't need to swap around the MIDI wiring, as *TS1* has four MIDI ports and automatic signal routing.

The *TS1* has a built-in mains power supply.

TS1 MIDI Tape Sync Unit £99.00

Affordable MIDI control for your non-MIDI gear

Little MCV will let your MIDI system control your analogue synths. It can generate control voltages for the 'one volt per octave' (log.) or the so-called 'volts per hertz' (linear) systems. The gate can be set to five volts positive, ten volts positive or S-trig. It has *MIDI In*, *CV Out* and *Gate Out* ports.



Classic drum machines and sequencers, such as the *TB-303* and *TR-808* are equipped with Sync24 ("DIN Sync") inputs. When connected up via *MDS*, they should start, play in time, and stop automatically by remote control from MIDI master equipment.

Both of these easy-to-use devices include integral mains power supplies.

MDS MIDI to Sync24 Converter.. £69.95
 Little MCV MIDI to CV Converter.. £75.95

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The above is a selection from the range of popular MIDI accessories, which are made in England by Philip Rees. Prices are quoted as a guide to UK retail prices including 17.5% VAT, valid at the time of going to press.

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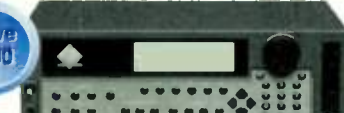
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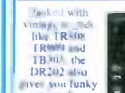
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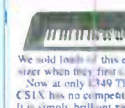
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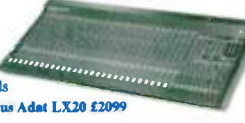


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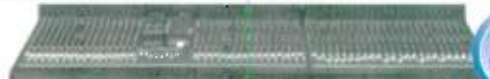


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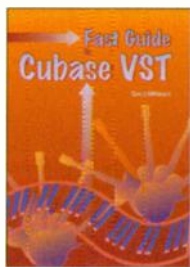
by Roger Brown

The first hands-on book dedicated to dance music — over 470 pages! The art of programming brilliant contemporary dance music, Drum 'n' Bass, Techno, Garage, and Ambient Hip-Hop etc, are all introduced within the context of *Cubase* commands and features. However, you don't need to own *Cubase* to learn from this amazing book, as most of the tips here can be used with any sequencer. The accompanying CD (PC & Atari) is packed with MIDI Files, plus audio samples for Drum 'n' Bass, groove templates, and demos of leading music software. The book also includes chapters on: Bassline & Rhythm programming styles, *Cubase's* Logical Editor & IPS, *Cubase Audio* and getting your creations distributed and sold. If you're into dance music sequencing, this book's for you!



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FAST GUIDE TO CUBASE VST NEW

by Simon Millward

This 350-page book provides essential information for quickly getting into Steinberg's *Cubase VST* (PC/Mac) MIDI sequencing and audio recording package.

The book covers all the important aspects of the program, including Audio and MIDI recording and Virtual Studio Technology. Installation and setting up of *Cubase VST* are explained with detailed information on how to record, edit, process and mix digital audio, and how to use EQ and effects. Several Steinberg and third party plugins are explored, and the book shows how to get the best from processing techniques such as compression, gating and limiting. Projects and tutorials provide valuable insights into how best to use *Cubase VST* for specific tasks, with plenty of time-saving shortcuts revealed.

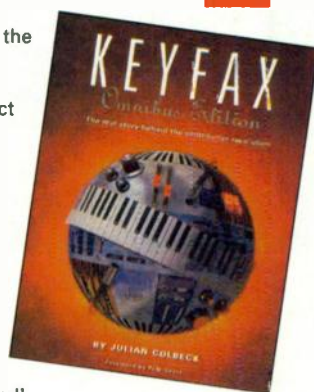
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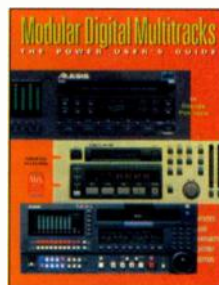
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by George Petersen

This book tells you everything you need to know about modular digital multitrack (MDM) recorders such as ADAT and DA88. Featuring unbiased reports and advanced operating techniques you'd never find in the manual. A must for anybody who owns a digital multitracker or is considering buying one. It also covers handy fault diagnosis and remedies, making this book an ideal reference for the secondhand purchaser on the lookout for the best used machines around.



MDMs covered include: Alesis ADAT (Type 1&2 models), Akai, Tascam, Sony and Yamaha.

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THE COMPLETE CUBASE HANDBOOK

2ND EDITION

by Udo Weyers

This second edition offers over 420 pages packed with real world applications and down to earth explanations of how to use all the powerful features offered by *Cubase* in all its many forms, with particular focus on *Cubase Score*. The book addresses all three platforms (PC, Mac and Atari) and differences between versions are covered in the appropriate sections.

The Audio versions of *Cubase* are dealt with in separate chapters, along with VST (though we'd recommend B374 *Fast Guide To Cubase VST* for more in-depth coverage of the

VST functions). If you've misplaced your manual or can't decipher Steinberg's original, then

The Complete Cubase Handbook is a not-to-be-missed purchase for users of this highly popular software.

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HANDBOOK OF MIDI SEQUENCING

by Dave Clackett

Written by leading MIDI song producer Dave Clackett of Hands On MIDI Software, this book will be of particular interest to musicians using General MIDI/GS/XG equipment, but all the examples are relevant whether you use a hardware based sequencer or an Atari, PC, Mac or Amiga. There are sections on synchronising to tape, standard MIDI files, copyright, transcribing from record, and a chapter on using MIDI files live.

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by Duncan R Fry

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from publishing, the book also covers copyright legislation, performing and mechanical rights, the royalty administration societies, music in film, broadcasting, theatre and ballet and commissioning agreements. There is also advice for composers setting up their own publishing companies. An exhaustive and highly useful book.

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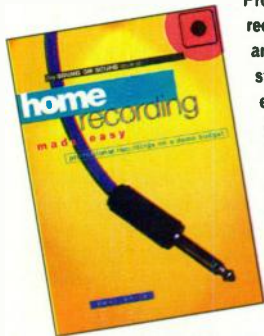


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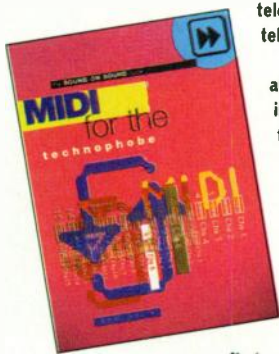
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television and the telephone.

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5 superb books from the Editor of **SOUND ON SOUND** magazine



RECORDING & PRODUCTION TECHNIQUES FOR THE RECORDING MUSICIAN



This 2nd Edition takes a very practical approach to demystifying the various techniques used to record and produce contemporary music. Aimed at the recording musician, the techniques described in this book are

equally applicable to the home studio, and are described in plain English, clearly illustrated with diagrams.

Recording & Production Techniques takes the reader through planning a recording session, getting the best performance from the artists, and producing the best possible mix making creative use of effects and processors. The book concludes with a valuable section on master tape formats and an overview of the various processes involved in duplicating CDs, cassettes and vinyl records.

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CREATIVE RECORDING 3 ACOUSTICS, SOUNDPROOFING & MONITORING


By Paul White

Want to improve the sound you get in your studio? This book is designed to take the mystery out of studio design, whether you run a bedroom studio or a commercial recording facility. In plain English, it explains how soundproofing works, how you can change your room acoustics to deliver the optimum monitoring environment, and how to choose and use your monitoring system. Illustrated by useful diagrams for the DIY enthusiasts.

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MUSIC TECHNOLOGY — A SURVIVOR'S GUIDE



Written in Paul White's jargon-free, thoroughly comprehensive style, *Music Technology — A Survivor's Guide* highlights common problems in recording and mixing music, addresses equipment dilemmas and offers troubleshooting advice. Most importantly it provides answers. Whether it's the debate on MIDI recording versus conventional multitracking, the basics of soundproofing, how to rescue an unsatisfactory mix, how to put together an accurate monitoring system or how to organise a recording session to get the best results with fewest problems, this is the book to answer your questions and aid your progress.

It also provides an overview of equipment types: for example, the pros and cons of hard disk recording compared to analogue, and the difference between the various types of studio outboard equipment including compressors and reverb units. Finally, Paul covers the hype and reality of vintage equipment. Featuring an exhaustive 50 page glossary and clear diagrams throughout, the *Survivor's Guide* is guaranteed to keep any music technologist on the right track.

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take your playing to new heights. Plus, open tuning, the capo, high-strung guitar, reading music and more! Styles include: Guns 'n' Roses, Bon Jovi, Hendrix Blues, Mississippi Blues, Django Style Jazz, Nuits En Moscow, Classical, Romance, Carter Style, Buffalo Gals and Bottleneck/Slide Style. Running time: approx 78 minutes Was £12.99

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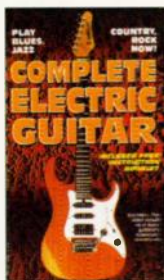
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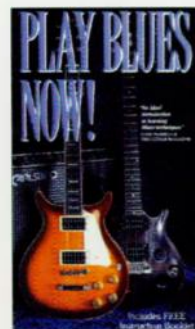
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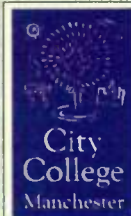
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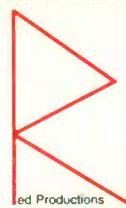
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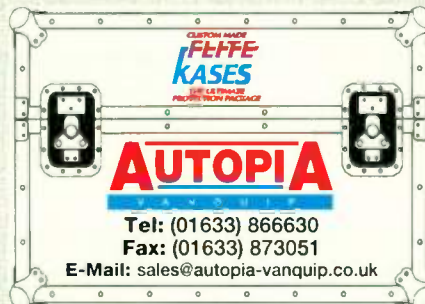
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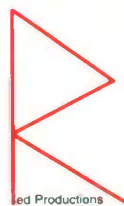
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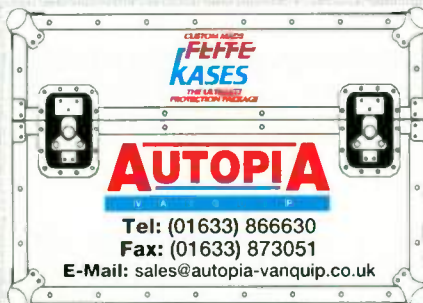
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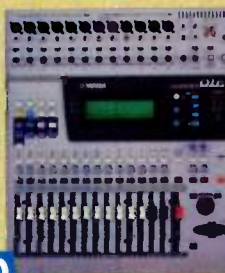


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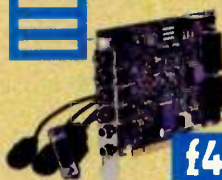


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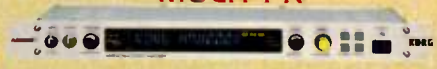
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Brian Willis bemoans the lack of creativity in synthesizer programming and electronic music.

One Sunday evening in the late '50s, I was watching the magazine programme *Arena* on the BBC. I remember this programme in particular, because it contained an item on some new instruments played by a group of French musicians. There were strange tubes and rods which made sounds completely unlike anything I had ever heard. These sounds were sometimes raw, sometimes ethereal, and the timbre changed with time; even on my very lo-fi television, this music was fascinating. I remember to this day a piece by Vivaldi: the sounds, though they should have been alien to a classically trained musician, were such that I just had to listen. Each line was clear, distinct, yet blended with everything else.

About 20 years later, my memory of this programme was shaken into life by two records I have played as much as any in my collection — *Switched on Bach*, and *The Well Tempered Synthesizer*, performed by a certain W. Carlos. It became clear to me that what I had heard way back in my youth was now called a Synthesizer. I marvelled at the way artistes like Carlos played every note, accurately, and one part at a time, into a tape recorder and built up wonderful soundscapes where every sound was new to me.

Then, to my mind, something went badly wrong. With all the developments in electronics, digital control and countless other things I do not understand, we now have synthesizers capable of

making 'millions of sounds'. I own three such machines, and they can indeed make more sounds than I have time to listen to. And my setup is modest by any standards — professionals have much more equipment. Why then, does everyone who uses this and similar equipment succeed in doing little more than making often very poor imitations of orchestral instruments? Surely this is a complete waste of hard-earned synthesizer power.

When I read the reviews in this excellent magazine, I am told that such and such a synthesizer has 10 string presets, 15 basses, and a good piano — but I can play these without recourse to electronics, as can so many others, and they are all copies of acoustic instruments. Then I read articles by people who have recorded an album, who explain that they tweak the reverb, or open a filter two notches to 'get the right sound', but all this seems to make no detectable difference to the final recording — they still sound like either reasonable imitations or totally naff caricatures of orchestral instruments. They are certainly not original sounds.


Now add to this the idea that no melody must be more than four or five notes long and the less involved the better, and the results do not seem to warrant all the time and money spent on the development of the synthesizer. The latest physical modelling efforts by Korg and Yamaha take this mockery of orchestral instruments to illogical extremes.

But it may be that I have got the wrong end of the stick. Perhaps the world of music is all about copying, perhaps people are happy to have poor imitations of acoustic instruments, perhaps four notes is all most people can take (though my GCSE music classes suggest otherwise). Perhaps the point of ever more powerful synthesizers

and sequencers is to allow each one of us to have our own orchestra and recording studio, so our boring four-note melody, our three-note killer riff, our stonking bass line and one-note hook can be recorded for posterity, played on a poor imitation of some real instrument. Ingenuity, imagination, and creativity seem to have dried up.

Dig out the Carlos recording of the third movement of Bach's fourth Brandenburg, with its totally original sounds and eight tunes playing at the same time, and deny that it has depth, drive, and anything else you need. It may not be to everyone's taste, but it is a better use of the creativity that should come from synthesizers than all the recent recordings I have heard put together.

Then we have the sampler — God's gift to the unoriginal and uncreative, and a real curse. 'This bass riff is an aardvark breaking wind inside a large garage, built with London brick and an aluminium door to resonate, tuned down three octaves and fifteen ticks. But this one was fed on organic rice to give it a new sound!' Believe me, you are only kidding yourself if you think this is worthy of attention.

Personally, I try to make new sounds. I write my own arrangements of Welsh folk music (everyone usually does Irish and Scottish music) without the infernal ticking of some bloated analogue drum, and if you are into one note riffs, boring basses and flatulent aardvarks, then you just won't understand my music at all. I just wish that someone would use all the creativity inherent in synthesizers to create some music which might be beyond my imagination, and as original as those early examples which promised so much yet have been stifled on the cross of commercial viability. I would love to hear it! 



If you'd like to air your views in this column, please send your ideas to: Sounding Off, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambs CB3 8SQ. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address. Email: soundingoff@sospubs.co.uk



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