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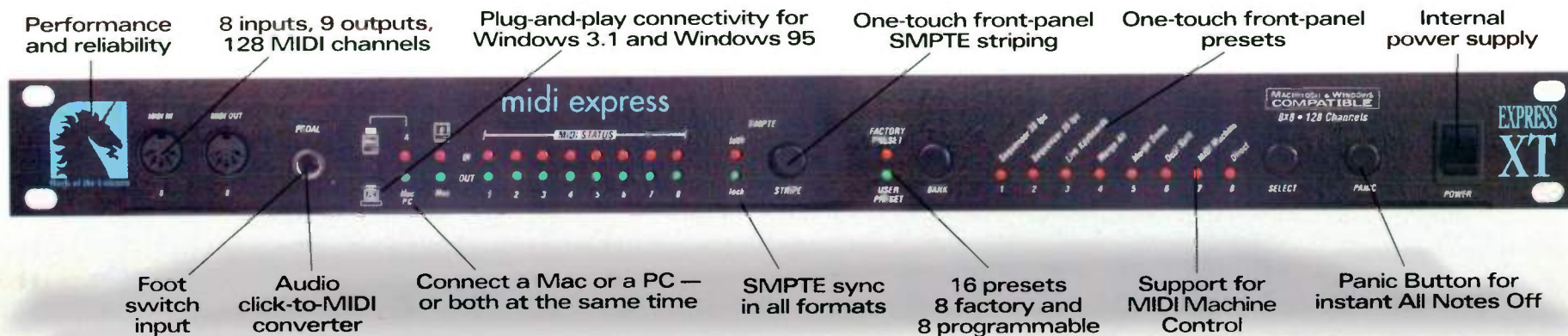
VOLUME 12  
ISSUE 3  
JANUARY 1997  
£3.25

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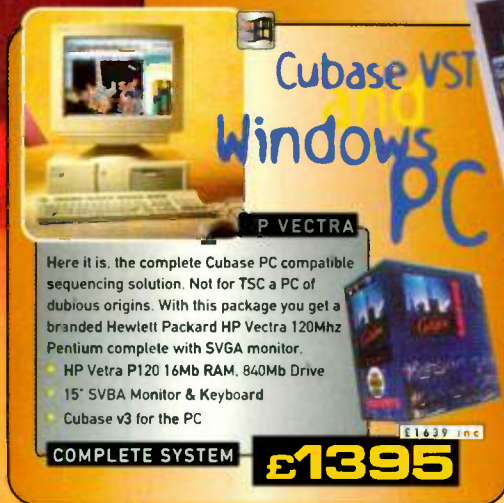
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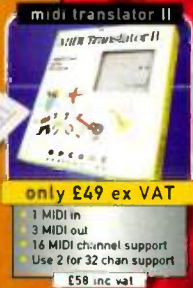
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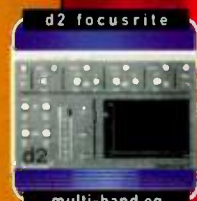
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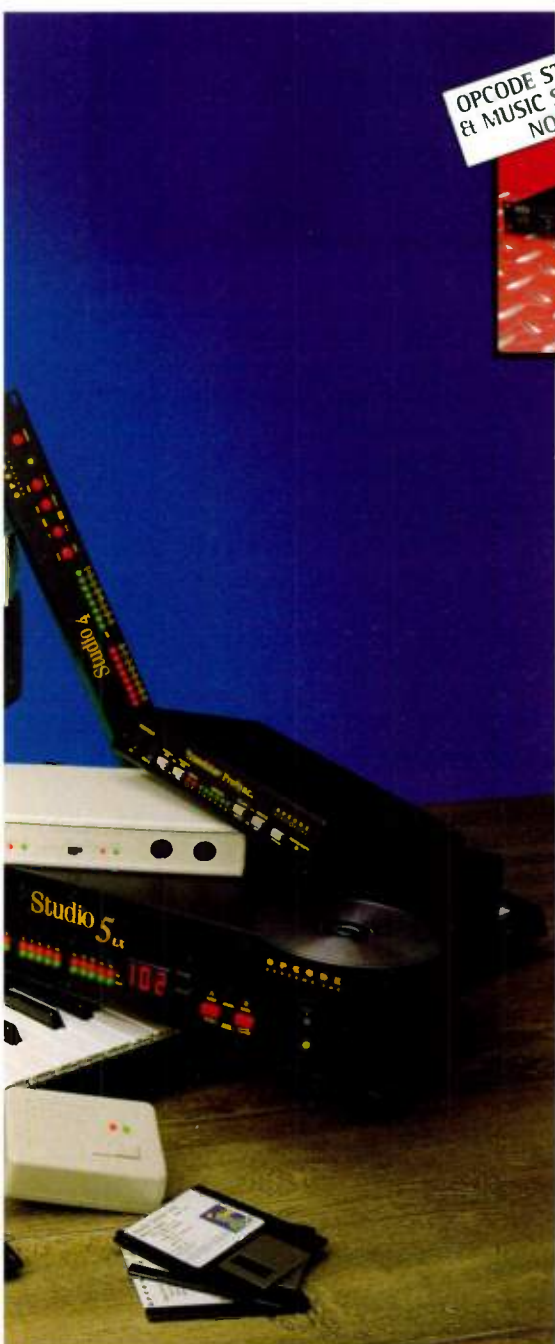
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than £200 and a cool £100 less than it's nearest rival, for a software package which offers stunning sequencing capabilities along with digital hard disk recording on Power Macintosh with no extra hardware required. Studio Vision Pro v3 meanwhile can be had for a incredible £429 ex VAT and offers the massive feature-set of Vision plus intelligent features such as audio to MIDI, MIDI tempo control of audio, pitch shift, other DSP functions and full automated mixing.

Call MCMXCIX for more information, or call into an Authorised Opcode stockist.



I've heard a lot of complaints from legitimate software users recently about copy protection systems. Few reasonable people would dispute the need for software manufacturers to protect their intellectual property, but it's unacceptable when the copy protection makes life difficult for the licensed purchaser of the software.

The two main types of copy protection used in music software are the 'dongle' or key, and disk-based protection, which usually allows a specific hard drive to be authorised from a master floppy disk. It's common practice to allow two installs to be made from the master disk, and an uninstall routine is then provided, so that the authorisation can be transferred back to the master disk prior to major disk surgery (such as reformatting). I feel most comfortable with the hardware dongle, usually a small plastic device that plugs into one of the computer's ports — but what happens if you want to use two or more dongle-protected pieces of software at the same time? On the Atari ST, you have to buy a multi-dongle expander unit — in other words, you pay extra for the privilege of running the software you've already paid for — and even then, there are stories of dongles from different manufacturers refusing to work together. In the Mac and PC worlds, dongles can usually be wired in series, sidestepping the need to buy an expander unit, but conflicts can occur between dongles from different companies. Disk-based install systems suffer no such problems, but if you do need to reformat your drive it can take hours to remove all your installed software.

What's my solution? Well, I like the idea of a software-updatable dongle that can simultaneously support several different pieces of software. One company, Waves, use such a device for their plug-ins, but a universal key accessible by all manufacturers would make life a whole lot simpler. For disk-based installs, it should be possible for legitimate registered users to phone a 24-hour helpline and be given a code in return, which could then be keyed in to place another 'emergency' install onto their master disk. To guard against disk corruption, why not supply two master disks, each containing one install, rather than one disk with both installs on it?

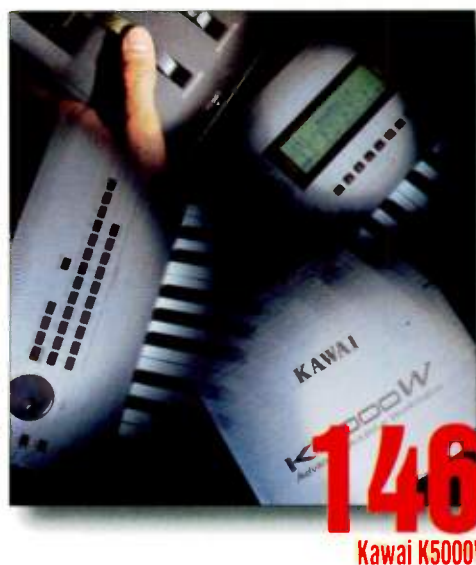


Of course, this wouldn't get around the hassle of having to de-install everything before major surgery or hard disk replacement, but surely it isn't impossible for the companies concerned to come up with a routine that will automatically transfer all the installs on your hard drive to one floppy disk, in such a way that they couldn't be pirated easily?

Perhaps when all software moves to CD-ROM, things will be simpler; Steinberg's WaveLab allows you to run the installed program freely a number of times before it asks to see the CD-ROM again. Perhaps an unintended benefit of this system is that you can install it on a friend's machine, so they can try it out free for a limited time before it 'evaporates'. Software is expensive, and very often you don't want to part with your money until you're absolutely sure the package you're considering can do the job. Allowing a limited free trial might be one way of overcoming this.

I don't suppose there's any simple solution that will satisfy everybody, but the present protection systems are still causing genuine frustration, and need to be improved. Of course, this won't happen unless there's enough pressure from users, so don't suffer in silence — make a fuss about it!

Paul White Editor



Kawai K5000W

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### SOUND ON SOUND

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# Crosstalk

Send your letters, queries, tips and comments to: The Editor, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.

Our email address is 100517,1113.

or from outside CompuServe, on 100517.1113@compuserve.com

## Sticky Labels

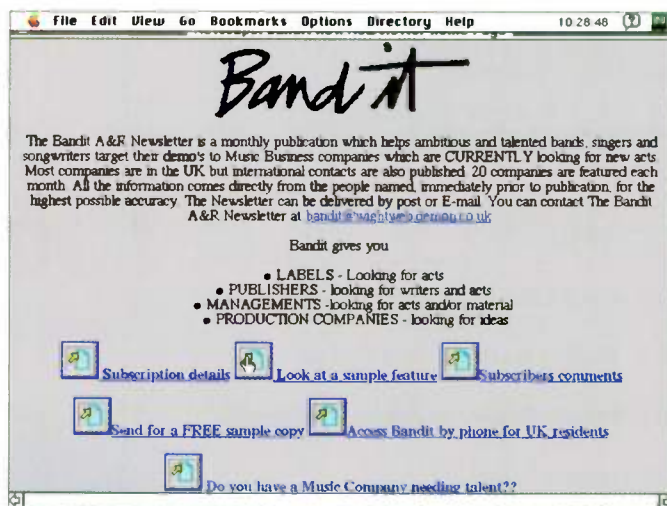
I am a Dutch singer/songwriter who has just moved to London, and I'm writing to you because I am looking for a list of UK record labels who might be suitable to release the CD I've just finished. I found a list of all the record companies in the UK recently; it contains all the addresses and telephone numbers but the problem is that it doesn't give information about what genre of music the companies release. This is the information I hope you can provide me with. Any help would be greatly appreciated as I'm running out of ideas as to how to obtain this information.

Daniel Baars  
via the internet

**Derek Johnson replies:** We can provide two answers to your query. First of all, a company called TMR produces a wide range of helpful, informative and affordable lists for all areas of the music business. Particularly relevant to your query is the A&R List, which contains the information you need to target your CD. Along with addresses and

phone numbers, the list provides details of each label's favoured musical style, and often a contact name. One interesting bit of data is a list of 'out of date' entries listed as current in other directories. The price of the A&R List is just £6, including postage and packing, and TMR can be contacted c/o M Bell, PO Box 3775, London SE18 3QR (or telephone 0181 316 4690). For your information, other TMR lists cover venues, rehearsal rooms and studios, fanzines and miscellaneous musical services, while their 30-page demo guide is packed with information on recording, packaging and targeting your demo effectively.

Another option is the Bandit A&R Newsletter, a monthly list detailing the requirements of the A&R departments of UK record labels. A lot of effort goes into keeping the newsletter up to date, and this is reflected in the service's costs. There are a number of prices available, depending on whether you pay quarterly, half-yearly or annually by cheque or standing order, or receive the newsletter by



The Bandit A&R web site.

email. The cheapest option is £30 for six issues by email (or £50 for 12), although if you're a new subscriber of the print version by standing order, your first quarter (three issues) is half-price, at £10. You can try out one copy free by simply sending a stamped, self-addressed envelope to Bandit. Their address is: Bandit (SOS), PO Box 22, Newport, Isle of Wight. PO30

11Z. You can email them on [sampleband@wightweb.demon.co.uk](mailto:sampleband@wightweb.demon.co.uk), and their web page is at <http://www.wightweb.demon.co.uk/bandit>. The details of the requirements of four brand-new companies are also provided weekly on a premium-rate telephone number; call 0336 411277 (+5p a minute cheap rate, 50p a minute at all other times). □

## He's Got The Power

Could you please supply a little information about mains power? I intend to buy a Mass 500 power amp, and I would like to know how much power it draws and how it would fit into a small home studio. There are three fuses running my studio — one for the lighting, and two for wall sockets — of which one double socket powers all my equipment. The entire

power needed to run all the machinery is about 600 watts, 390W of which is for a rather low-output integrated amp.

I realise that amps only draw a tiny amount of the required power unless driven flat out — which mine never is — but I don't want to overload the mains with what for me is a large amp. I believe that one mains socket is

calculated as 230-240 volts, by 13 amps, equalling about 3000W. Is this correct, and what does it mean?

Phillip Davis  
London

**Paul White replies:** As you've already worked out, a 13A socket can supply up to around 3000 watts, and all your existing gear added together takes less than a third of this, so you should have no problems. The Mass 500W power amplifier will take around 800W if pushed to the limit non-stop, but your speakers (and ears!) would probably evaporate long before that. However, having this kind of power at home is beneficial, because it ensures that short, high-powered transients won't be clipped. In reality, your lighting probably takes a lot more power than your audio equipment, so don't start to worry until you bring in a lot more high-power gear. □





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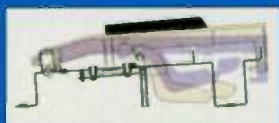


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**ALESIS**



# Crosstalk

## No Gain, No Pain

I posted the following to the Usenet group rec.audio.pro, and thought that you might like to comment, particularly since I've found guidance on this subject from one of Paul White's excellent books.

Can you provide an answer to the following scenario, involving recording to multitrack tape and then mixing to 2-track? When track laying, I set my channel and group faders to 0dB, and adjust the input gain on the desk so that the desirable level to tape is achieved. I also use channel PFLs to ensure that the signal passing through the desk is within a usable dynamic range. If the desk and machine are set up properly, then the level to tape and PFL level should be the same anyway. The general concept here is that if the mixer channel is as full of signal as it can be without running into distortion, the signal-to-noise ratio is at its best.

I then monitor via tape monitor channels on the desk, adjusting individual levels to suit. My question arises when it comes to mixdown. I was taught, and I have read, that one should set levels in the following way: for an average section of the music, set master faders at 0dB. Set channel faders at 0dB. Adjust this average section of the mix by using the input gains at the top of the channel. Faders will probably need to be ridden as the song progresses, but the average mix entails all channel faders being set at 0dB. I like this way of working, since it keeps me organised during a mix, with faders generally in a straight line at 0dB.

But doesn't this mean that there is a danger of the signal-to-noise ratio of the desk being compromised? For instance, if you have a vocal recorded on tape at a decent level, but that vocal is only intended to be heard quietly in the mix, then with the channel fader set at 0dB, the input gain would have to be fairly low, meaning that the channel itself would have a relatively low-level signal passing

through it, with the fader unnecessarily amplifying the spare headroom left in the channel — ie. the noise. Doesn't it make more sense to set levels for mixing by PFL'ing the channels, filling them up with signal, and then setting the actual mix levels by putting channel faders in appropriate — but untidy — positions? If this does make more sense, why is it recommended to mix with faders at 0dB? As I said, this is the way I like to mix, but is it right?

Dave Howard  
via the internet

**Paul White replies:** *Technically, using your PFL buttons to set the input gain will produce the best signal-to-noise ratio for each channel, but it is inconvenient if it leaves you with a fader very near the bottom of its travel, simply because the sound is needed at a low level in the mix. The reasoning behind some engineers setting the faders to 0dB, and then tweaking the trim controls to suit, is that you can mix with the faders in a more convenient position. This can, indeed, compromise the signal-to-noise ratio to some extent, but in terms of the actual amount of noise added by the channel in question, it won't be any more than from any other channel that has its fader set at 0dB.*

*Normally, if the level were set up using the PFL buttons, when a signal was used at a low level in the mix, its noise contribution would also be lower than the other signals. With a 0dB fader setting, on the other hand, the channel may contribute the same noise as the other channels, but it won't contribute more. It's really a trade-off between convenience and acceptable noise, and providing it only applies to one or two channels, it's probably OK to do. It's perhaps more important to ensure unused channels are un-routed (not just muted), and that your maximum aux send levels are around three-quarters up or more. Gain structure doesn't stop with the input trim control!* ☐

## Copy Conundrum

Further to Daniel Wiener's letter in the December 1996 issue, I have a similar problem — I thought I was alone until then! I have two Alesis ADAT XTs, and I master to a Tascam DA30 MkII DAT machine, via a Tascam 2600 desk. My cassette recorder is a Pioneer CT339, which plays back recordings made from CDs just fine. However, when I copy from

**Paul White replies:** *Many people have problems getting a good sound onto analogue cassettes, and part of the reason for this is that cassettes don't like a lot of high-frequency energy. Commercial recordings are often EQ'd and compressed, but home-brewed music can give cassettes a particularly hard time. Using an exciter to brighten the top end may*



the DA30 to cassette, the mix becomes blurred and the top end is painfully 'glassy'. I don't let the cassette recorder's levels go beyond the recommended levels. I can overcome the problem a little by copying from the DAT back to two tracks on an ADAT, using the desk's EQ to take off a little top and bottom, but this is rather inconvenient. The DA30 phono outputs are a nominal -20dBv, maximum 2 volts, with 430Ω impedance; the cassette deck's inputs are 63mV, with an impedance of 52kΩ. This is Greek to me — does it mean a mismatch or not?

I was also wondering whether it was possible to copy from DAT to ADAT in the digital domain — the DA30's digital output is on coax, while the ADAT's connection is optical. On the ADAT front, I'd like to make a note about its reliability. One of my XTs has been fine — it has V3 software. The other, a V4 machine, had to be returned to Sound Technology for attention, since it was registering enormous error rates from brand new. It now has V5 software and seems OK; my only gripe is that lock-up time can on occasion run to five seconds or so.

Great magazine; I'd be lost without it.

John Green  
Leamington Spa

*also make it more difficult to record on cassette. Try out a few different brands of tape, as some are noticeably better than others in this respect. From the figures you've sent, I wouldn't anticipate that a level mismatch is to blame — I copy from my DA30 MkII directly to a TEAC cassette deck with no problems at all. As a rule, I use a good-quality Type II tape with no noise reduction.*

*To copy DAT tracks to ADAT in the digital domain, you'll need an Alesis A1-1 interface (call Sound Technology, 01462 480000), which handles both the format and sample rate conversion. Unless you have a desperate need to do this, you'll probably find it's too expensive an option. As to the ADAT's slow lock-up time, it's best if you always let both machines stop before putting them into play. I know the lock-up time is inconvenient sometimes, but ADATs are around the same price as the VAT on a professional digital multitrack. If it's really getting you down, consider making a one-track rough mix of tape 1 on a track of tape 2, then use this as a guide when overdubbing. This way you can do all the intensive shuttling using just one of your machines. Bring the other machine back on line when you come to mix.* ☐





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# Crosstalk

## Burning Desire

I recently bought a Plasmon CDR 4240 which came bundled with Adpatec's *Easy CD Pro '95* to burn audio and data CDs. Although it performs its basic functions well enough on my P90 PC, it has serious shortcomings in terms of mastering audio CDs:

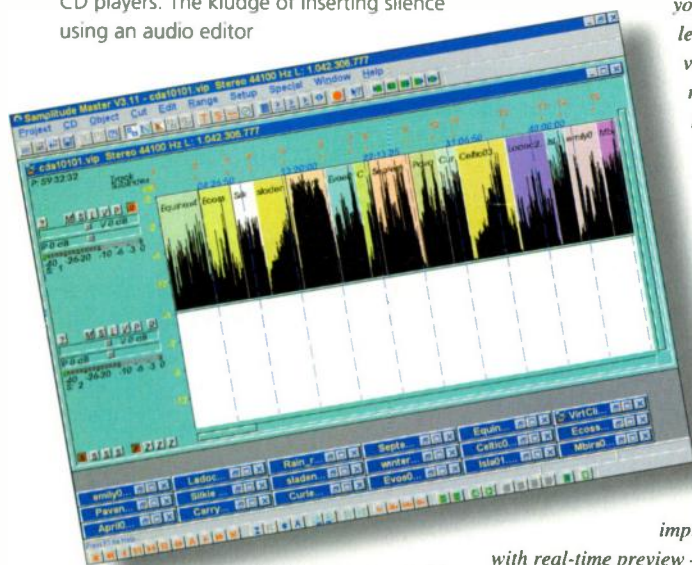
- You only have the crudest control over the start and end times of tracks — you cannot insert PQ (track start and end points) where you want, and in particular, you can't reduce the gaps between tracks to less than about a second. This is useless if adjacent tracks are parts of a much longer overall composition and need to flow precisely into each other, but also allow listeners to access tracks directly on their CD players. The kludge of inserting silence using an audio editor

software. The first application for the PC to provide Red Book standard audio CD authoring is *Hohner Midia's Red Roaster* (£499.99, contact 01222 887333). As luck will have it, *Red Roaster* is about to be reviewed in *Sound On Sound*, but briefly, the software is a *Windows 95* application, that uses *Windows soundcards* and will provide you with the *precise control over track start and end index points and the ISRC coding that you require. The resulting CD is full Red Book standard, and is not only fully playable on domestic CD players but is also glass master-ready. This means that, if you wish, you can take it to a CD plant for duplication.*

*Red Roaster will allow you to carry out precise level editing, as well as a variety of other essential mastering functions, including channel balancing, EQ, crossfades, DC offset correction, noise reduction, dynamics, de-clipping and normalising. The dynamics function (compressor, limiter, expander and noise gate) and the 3-band parametric EQ are especially*

*impressive, as they operate with real-time preview — although you may need a faster processor than your P90 to get the most out of this. You can import existing WAV directly from hard disk into Red Roaster but if you record your tracks in from DAT you have the options of converting the sample rate from 48kHz to 44.1kHz on the fly. All subsequent edits can then be performed using 24-bit floating-point processing. This minimises quantisation degradation and you can choose from a range of dithering options as the audio is converted back to 16-bit for playback and recording to CD.*

*Adaptec Easy CD Pro '95 is a stable, reliable application and may be used to burn Yellow Book and Orange Book CD-ROMs. But as you discovered, the audio discs Easy CD Pro '95 creates are not Red Book standard, and are at best useful as reference discs. Incidentally, ISRC (Industry Standard Recording Codes) are in theory a good thing, as they can be used to identify the audio recordings on the CD and so facilitate royalty collection. But their use is not compulsory, and they are by no means universally used even by the larger record companies.* ☐



*Amplitude Master, part of the Red Roaster CD authoring package.*

ain't much good if you need a shorter gap than the second or so that that *Easy CD Pro '95* allows.

- You cannot insert ISRC coding (a type of audio bar code that will eventually automate the process of royalty collection).
- You cannot adjust the relative audio levels of each track

Although some Mac-based software offers these facilities, I have yet to find a suitable piece of software for the PC. Can you suggest a software package for the PC that might perform these most basic of functions?

Mark Law  
via the internet

**Janet Harniman Cook replies:** *Your choice of the Plasmon CDR 4240 CD recorder is an excellent one; it's amongst the best on the market and one of the most affordable. The CDR 4240 will write Red Book standard PQ subcodes, but to do this you need dedicated*

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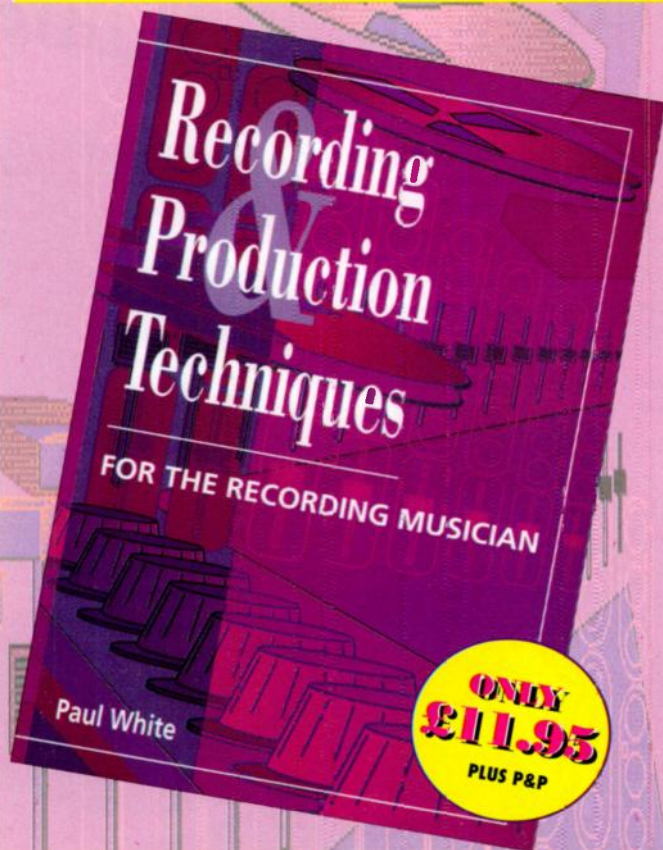
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# Crosstalk

## Get Smart

I'm trying to find an address of a company that supplies or manufactures MIDI synchronisers using 'smart' FSK (Frequency Shift Keying) — ie. recognise the MIDI Song Position Pointers generated by most MIDI sequencers.

Thanks for your help.

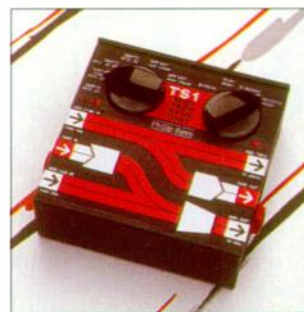
J Dunbebin  
Wrexham

**Derek Johnson replies:** For many MIDI users, the simple sequencer-to-tape synchronisation solution is to use a smart FSK box. Firstly, a code is recorded onto one track of a multitrack tape, for the complete length of a song; when played back, the code is used to generate MIDI timing information, which then drives your sequencer (or drum machine), in perfect sync with the audio on the tape. The 'smart' part comes in with the recognition of Song Position Pointers, little MIDI signposts that allow a sequence to play from any point within a piece after a tape has been stopped and started again, rather than requiring you to rewind and start at the beginning of the track after every time the tape is stopped.

More sophisticated synchronisation options are offered by SMPTE-generating

FSK unit. A 'Plus' option (which is user-installable, and costs a further £45) adds the ability to read MIDI Time Code from any source and convert it to SMPTE timecode.

Next in the price line is Tascam's venerable MTS30, at £129 (01923 819630). This unit has been out for quite some time, but still offers basic functionality, plus compatibility with the code generated by the on-board synchronisers used by Tascam's 488 and 688 Midistudios. Philip



Rees' £99 TS1 MIDI-tape sync unit (01608 811215) will also read and generate both SMPTE and smart FSK, with all modes easily selectable by a pair of big friendly knobs. Most affordable is Midiman's SmartSync, at £89 (01205 290680). Midiman are perhaps best known for compact mixers and MIDI

interfaces, but their range of synchronisers also includes sophisticated SMPTE and video sync units.



devices — SMPTE timecode is time-based and independent of tempo, unlike smart FSK, where the tempo is fixed once the code has been recorded. But smart FSK is a much easier to use, and cheaper, option. Four choices for smart FSK synchronisers come to mind, the most expensive of which is the £149 JL Cooper PPS2 (Sound Technology 01462 480000). This device is actually SMPTE-aware as well — it can generate and read SMPTE, if your software can tell it to. Otherwise, it works perfectly well as a smart

A couple of points to keep in mind are that FSK codes generated by different machines are not necessarily compatible (SMPTE code generated by one machine can be read by any other) and that using a synchroniser in a simple setup might cause trouble if you want to add MIDI parts to a sequence while it's sync'd to tape. Luckily, all four units described here offer some way of merging the input from your master keyboard with the MIDI timing information going to the sequencer. ↵



# We made the console,



## ...you wrote the ad.

● "I just sold my Mackie 8-bus and purchased the new Ghost console. The difference is amazing. The Ghost is the warmest sounding board I've ever used."  
- Mike Perkin (The Lab Recording Studio, Emmaus, Pa)

● I replaced a console that was more than 3 times the price, and got a quieter, more transparent, and sweeter sounding console! Big console feel, with an amazing price! - Kurt Bevers, Brownell Sound, Oregon.

● "An incredibly musical console, ultra flexible with a real usable EQ. It is absolutely the best sounding project studio board that I've heard". - Howard Givens, Spotted Peccary Studios."

● "I love the desk, the EQ is just marvellous. Ghost is the best 8 bus recording desk on the market." - Lee Hamlyn, Engineer.

● "Intuitive handling, flexible routing, great Soundcraft sound."  
- Melvin Fernandes, Recording Engineer, C&M Studios, India.

● "I use the Ghost for several radio shows doing live performances. The EQ is amazing, I'm on air in 5 minutes! Doing dance stuff is one, doing live stuff is another. But I use only one board for both of them, The Soundcraft Ghost." - Barney Broomer, Sonic One Rotterdam.

● "Ease of operation and the numerous in-line inputs for my synthesizers and samplers is why I purchased the Soundcraft Ghost console." - says President of Saban Entertainment and producer of Mighty Morphin Power Rangers Shuki Levy.

● "I didn't know how useful mute groups could be and how good the EQ had to be until we used the Soundcraft Ghost." - Stefaan Windey, La Linea Musicproductions b.v.b.a., Belgium.

● "It sounds great and the EQ is very precise which makes it very easy to pin-point the frequencies I need to work on. Ghost enables me to finish mixes on the console at home, without having to use any other studio." - Phil Kelsey (Remix Engineer)

● "The console is very user-friendly and is constructed so well that it can easily withstand the rigors of even the most hectic of production schedules."  
- Corey Dissin, Producer at Paul Turner Productions.

● "Both myself and our Production Director Jeff Thomas used the console for PowerStation and were equally very, very impressed. For the money, the console is fantastically versatile, has good headroom and a very impressive EQ." - Alex Lakey (Engineer for PowerStation)

# Ghost

"Let us know what you think about the Soundcraft Ghost by visiting our web site at <http://www.soundcraft.com> or via e-mail to [info@soundcraft.com](mailto:info@soundcraft.com)"



# shape of things to come

by Derek Johnson

## Waldorf's salad days

Waldorf have released a new version of their Pulse MIDI-controlled monophonic synth module (reviewed in *SOS* February 1996). The Pulse Plus offers the same analogue sound and MIDI implementation as the original, and adds an integrated CV/Gate connection, plus an audio input that allows you to treat any sound with the Pulse's comprehensive synth section.

The price is £699.95 including VAT.

- A** Arbitrator Group plc, Wilberforce Road, London NW9 6AX.
- T** 0181 202 1199.
- F** 0181 202 7076.
- W** <http://www.demon.co.uk/arbitrator>

*SOS* can be reached on CompuServe; our email address is 100517,1113.

Our full Internet address is 100517.1113@compuserve.com.



## TeeBee gets Yellow fever!

Blue Systems, UK distributors of the Syntecno TeeBee TB303 clone (reviewed *SOS* July 1996), have announced that the module is now available in bright yellow! Apart from the distinctive new colour scheme, the TeeBee also offers some extra internal enhancements: it now boasts a Korg-style ring modulator, with a VCO Ring Detuning control, along with enhanced electronics

and a mixable analogue input filter. Happily, there's no change to the TeeBee's retail price following these enhancements: that remains at £528.75 including VAT.

- A** Blue Systems, The Old School House, Church End, Ashdon, Saffron Walden, Essex CB10 2HG.
- T** 01799 584095.
- F** 01799 584094.
- E** [info@bluesystems.com](mailto:info@bluesystems.com).
- W** <http://www.bluesystems.com>

## Yamaha: Now we are three

Yamaha's pair of digital consoles, the ProMix 01 and up-market 02R, becomes a family with the introduction of the 03D. Based on the DSP3 digital signal-processing chip introduced by the 02R, the 03D is more compact and affordable, and comes with some unique features of its own. The desk offers 26 inputs, with 16 direct outputs, four busses, stereo output, six auxiliary sends and two internal effects processors. Input features include 4-band parametric EQ, buss assignment routing and a compressor/limiter/gate on every channel. Of the 26 inputs, 18 are analogue with 20-bit converters, and

eight mic preamps, with phantom power, are provided. On the automation front, the 03D can be referenced to MIDI Time Code, and offers static scene changes with crossfades, and dynamic control of up to 2000 parameters. It has 19 motorised faders.

A variety of interface cards can be installed in a slot at the rear of the 03D, allowing it to digitally interface with a range of digital multitrack recorders. The cards are the same as those used by the 02R, and when installed in the 03D, can send and receive eight digital audio channels; the user chooses whether the outputs are busses, aux sends or channel direct outputs. Cards are available in AES/EBU, Tascam TDIF, ADAT optical and Yamaha formats.

The dual 32-bit effects processors offer Yamaha's latest effects algorithms, including those from the top-of-the-range Pro R3 digital reverb. The large display used on the 02R is again found on the 03D, and provides real-time readout of all console parameters, EQ,



effects and dynamics libraries, and metering. For 02R owners in search of extra channels, a Cascade Kit allows the 03D to be digitally linked to the 02R. At the time of going to press, a UK price was yet to be set, but the US dollar price was expected to be under \$4000.

Back at the truly accessible end of Yamaha's product line, there's the new REV500 digital reverb, which features a version of the chip designed for the Pro R3 at its heart. This REV500 offers 32-bit internal processing, 20-bit converters, a 44.1kHz sampling rate and 96dB dynamic range. The true stereo unit has 100 preset and 100 user

memories, and four dedicated knobs give the user instant control over the most important sound editing parameters. The display also provides a graphic representation of decay, pre-delay times, and the frequency content of the reverb. Connections include jacks and balanced XLRs, and inputs and outputs are switchable between -10dB and +4dB operation.

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





# Roland's fairly secret Synth

There was a bit of a flap on the Internet during November: news leaked out that a new Roland synth, based on physical modelling, was due imminently. Yet almost as soon as the news appeared, it was gone, generating waves of speculation amongst 'net-aware synth enthusiasts. But there does appear to be some substance amidst the speculation, and we should be in a position to confirm the following facts in a month or two. First of all the name: the new synth is apparently called the JP8000 — almost an echo of the classic Jupiter 8? Roland seem to be offering a true digital replication of an analogue synth, complete with something in the region of 40 knobs, plus various other interesting features — thanks to SOS contributor Paul Nagle for helping with some of the following details:

- 49-note, velocity-sensitive keyboard, with assignable ribbon controller and pitch bend/modulation lever.
- Single, dual, and split key modes.
- 8-voice polyphony.

- 2 modelled 'oscillators', with detuning and oscillator sync.
- 7 'oscillator' types: Super Sawtooth, Triangle Modulation, Noise, Feedback OSC, Square/PWM, Saw, Triangle.
- Effects including 12 chorus types and five delay types, plus tone control.
- 128 user and 128 preset Patches.
- 64 preset and 64 user Performances.
- Arpeggiator and RPS (Realtime Phrase Sequencer).

There's another Roland release too, a little more traditional but still the subject of a similar internet flap. The JV2080 module will offer 64-voice polyphony, eight expansion board slots, maximum 2900 patches, 16-part multitimbrality, three effects processors and JV1080 compatibility. The basic, unexpanded machine will have five banks of 128 Presets each, with 10 drum sets and 64 Performances; there's one bank available for user settings, featuring 128 patches, two rhythm sets and 32 Performances. In addition to the main stereo output, the JV2080 has two direct outputs. More data when we get it, and reviews as soon as they hit these shores.

**A** Roland UK Ltd, Atlantic Close, Swansea Enterprise Park, Swansea, West Glamorgan SA7 9FJ.  
**T** 01792 702701.  
**F** 01792 799644.  
**W** <http://www.roland.co.uk>

# N-joy from Korg

Hot on the heels of Korg's recently-launched N-series of synths and workstations comes the NS5R synth module (£599). The new synth offers 64-note polyphony, 32-channel multitimbrality, a PC interface and 12Mb waveform memory. Two completely independent multi-effects processors are provided, each with a choice of 47 effects types. On the sound front, there are 1049 patches and

384 combinations in ROM, plus 32 drum programs. There's room for 128 patches and 128 combis in user RAM, and MIDI File users will welcome complete General MIDI compatibility, with XG and GS sound maps. As an option, an expandable WaveBlaster-compatible daughter board can be installed internally to increase the number of sounds, to provide extra GS or XG functionality or to increase the maximum simultaneous polyphony.

**A** Korg UK Ltd, 9 Newmarket Court, Kingston, Milton Keynes MK10 0AU.  
**T** Brochure Line 01908 857150.  
**F** 01908 857199.



Cubase VST v3.02.

# Soft options at Steinberg

Steinberg's Cubase VST MIDI + Audio sequencer for Power Macs has just had a significant upgrade. Cubase VST v3.02 now supports Digidesign's Audiomedia III card and Korg's 1212 PCI card, for professional-quality digital and analogue ins and outs. The new software also features a new master effects rack, with up to four stereo plug-ins, and a new plug-in interface for third-party developers. The first product to take advantage of this is *Audio Track* by plug-in specialist Waves. *Audio Track* offers a single window interface, with 4-band para-graphic EQ, compressor/expander and noise gate. Users also get A/B comparison, mono/stereo mode, and full Power Mac native processing, with no additional hardware required.

Other new Steinberg software includes *TimeBandit* v2.5, with a new voice mode that helps to maintain original vocal characteristics "even with a fairly extreme shift", and a range of new plug-ins for the PC-based *WaveLab*, now at v1.5. Plug-ins include *DeNoiser*, *DeClicker*, *Spectralizer*, *Externalizer* and *Loudness Maximiser* (the latter is also available for *Cubase VST*). The first two products are self-explanatory, while the *Spectralizer* is a sophisticated psycho-acoustic enhancer and the *Externalizer* is a monitoring optimiser for headphone use, which apparently turns your headphones into a pair of virtual monitors. The *Loudness Maximiser* aims to help you get the maximum loudness without losing

the feel of your original recording, adding "punch and brilliance" to the final mix.

Also new from Steinberg is *X-Pose*, which offers a sequencer-like environment for working with video clips. Developed in conjunction with Belgian company Arkaos, and aimed at composers who want to enhance their music with graphics and visual effects, *X-Pose* differs from many similar packages in that the graphics



WaveLab 1.5.

are driven by the music in real time, via MIDI. Basically, QuickTime Movies or pictures are assigned to a virtual keyboard in the same way that audio files would be allocated to keys on a sampler. Each image can also have an effect applied to it, and these can also be controlled in real time, via MIDI controller data. At present, *X-Pose* is available for Mac only, and can be triggered by MROS, OMS2-compatible applications or external MIDI sequencers. The price is £449 including VAT.

**A** Harman Audio, Borehamwood Industrial Park, Rowley Lane, Borehamwood, Herts, WD6 5PZ.  
**T** 0181 207 5050.  
**F** 0181 207 4572.



## Get a LIFE

Electronic musicians looking for something a little more exotic than a keyboard to generate



musical ideas should cast an eye in the direction of TechnoMage's LIFE — Little Infinite Frequency Expander. Designed by one Grant Stevens, who is also a whizz at fixing old synths, LIFE is

virtually impossible to

describe in words. The picture in the vicinity of this item might help, but basically, LIFE is a cup-shaped device which is rather pleasant to hold; on the top are eight pots, which you twiddle. The knobs produce results which interact with each other, creating evolving sound textures in the process. The experience is heightened by a translucent dome, which pulsates and changes colour with the sound. Grant notes that LIFE could be used as a basis for composition, a source of new sounds and effects for sampling, or for general inspiration. Barry Wooding of Longwave Instruments, manufacturers of theremins, notes that LIFE will actually work with Longwave's tneremin-to-MIDI interface, which could provide an interesting avenue of exploration. The unit is expected to retail for less than £150.

**A** TechnoMage, Woodcote, Tremont Road, Llandrindod Wells, Powys LD1 5DA.

**T** 01597 822138.

**A** Longwave Instruments, Ashley Lane, Hordle, Lymington, Hants SO41 0GB.

**T** 01425 610849.

A small error crept into one of the PC Musician features in the November issue of SOS. We stated in 'The PC in Pieces' that the Yamaha SW60XG synth card could plug into a PCI slot on a PC; this is not in fact the case, as the SW60XG is not a PCI card. We'd also like to point out that this error was not made by the writer of the article, Janet Hamman-Cook.

Aspen Media have been appointed UK distributors for Dutch company CQ's range of video and audio head-cleaner sachets. The CQ sachets have been developed specifically for cleaning all audio and video tape heads — rotary or stationary — and contain a non-woven, lint-free tissue impregnated with pure isopropyl alcohol. TEAC/Tascam Netherlands have approved the CQ sachets for use with all their recorders, and Dutch broadcaster NOB regularly use the range.

**T** 01442 255405.

We omitted to credit the photos for both the Steve Levine and Pete Gleadall features, in the December issue of SOS, to photographer Piers Allardyce who, as usual, did a sterling job. Sorry Piers!

Peavey Electronics are sponsoring a 'Battle of the Bands' competition being run by Steel City Promoters Ltd, in Sheffield. For the heats, starting in January, Peavey will provide two sets of backline, drums and PA. Granada will be televising some of the later heats, and the competition will end in June, when two competition finalists will win a chance to play at Stirrings, a two-day music festival at the Don Valley Stadium in Sheffield.

**T** Peavey  
01536 461234.

**A** Steel City Promoters Ltd, PO Box 1138, Sheffield, S1 4YN.

## Cooking with Microwave II

While it can be all too easy to drown in information when surfing the Internet — and much of it is pretty useless — occasionally something tasty comes to the surface. Elsewhere in these pages, you'll read news of a physical modelling synth from Roland, which first surfaced on the web, and now SOS can also confirm recent net rumours of a Waldorf Microwave II synth module. Externally, the new synth features five rotary dials and a 2-line x 40-character display. Internally, the sound-generation principle is the same as the original Microwave, with a couple of interesting new

twists. The synth is 10-voice polyphonic, with two oscillators per voice, two wave generators, a mixer, two filters in series, a stereo amplifier, four envelopes, two LFOs, and a modulation matrix. Pause to take a breath... Per sound, the Microwave II also features an arpeggiator, "powerful envelope and voice-trigger modes" and an in-built chorus effect. There's room for 256 patches and 128 8-voice Multis; each wavetable features 64 waves, and there are 64 ROM and 32 RAM wavetables. To complete the numbers, the synth is due to cost £999.

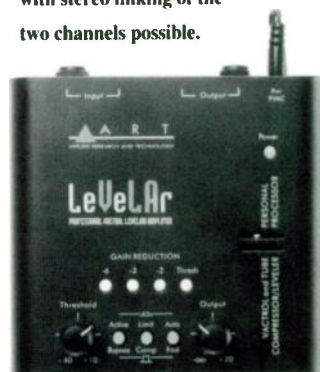
**A** Turnkey Professional, 114-116 Charing Cross Road, London WC2H 0DT.  
**T** 0171 240 4036.  
**F** 0171 497 0690.  
**E** sales@turnkeypro.com  
**W** http://www.turnkey.com

## Cheap tubes from ART

The ART range of signal processors just keeps on growing, with a range of tube-equipped levelling amps just released. All three share ART's new Vactrol Compressor technology, and combine the classic sound of valves with '90s low-noise electronics. The range offers the engineer the opportunity to apply serious compression in a musical fashion, without squashing the signal — although squashing is available if you require it!

- The Levelar tube-levelling amp (£149) is a compact single-channel device based around a 12AX7A tube. The controls are few — three switches and two knobs — and connectors include balanced jack and XLR sockets on both input and output.
- The Dual Levelar (£299) is a two-channel levelling amp,

similar to the Levelar, but mounted in a 1U rack, with stereo linking of the two channels possible.



- The Pro VLA (£TBA) is another 2-channel device, but is mounted in a 2U package to accommodate large meters and an extended selection of controls.

**A** Key Audio Systems Ltd, Unit D Chelford Court, Robjohns Road, Chelmsford CM1 3AG.  
**T** 01245 344001.  
**F** 01245 344002.





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shape of things to come

## Spirit of Radiohead



DA88 digital 8-tracks. Co-producer Nigel Godrich notes that the band "wanted to find the most relaxed environment in which to play, develop tracks and record." The Spirit Studio is being used in tandem with the main MTA desk to provide monitor mixes during rehearsing and tracking. After recording these sessions, the desk, along with the DA88s, will form the centre of a new home studio which the band are equipping.

**R**adiohead's new album has been recorded during a six-week lock-out at Jane Seymour's mansion, near Bath — the same location used in the past by the Cure. Sitting amongst the guitars and effects pedals is a Spirit Studio 24, teamed with a pair of Tascam

**A** Spirit by Soundcraft, Cranborne House, Cranborne Industrial Estate, Cranborne Road, Potters Bar, Herts EN6 3JN.  
**T** 01707 665000.  
**F** 01707 660482.  
**W** <http://www.spirit-by-soundcraft.co.uk>

## West gets wilder

**T**wickenham-based retailer Way Out West Music Company have opened a dedicated hi-tech music department, which features full demo facilities so you can try out the hardware hands-on. A wide range of recording equipment, software, samplers and synths

ancient and modern will be on display at the premises. Incidentally, Way Out West was recently voted best UK shop for studio equipment by the London Evening Standard.

**A** Way Out West, 47 London Road, Twickenham, Middx TW1 3SA.  
**T** 0181 744 1040.  
**F** 0181 744 1095.

SOS can be reached on CompuServe; our email address is 100517,1113.

Our full Internet address is 100517.1113@compuserve.com.

## caught in the net

### SOUNDCRAFT

In last month's report on the new Soundcraft web site we unfortunately referred to the wrong company in part of the item — our apologies to all concerned! Soundcraft have since dropped us a line to point out that the site now contains a dedicated section for their acclaimed Ghost and Ghost LE mixing desks, containing reviews, applications, user comments, updates and press releases.

**W** <http://www.soundcraft.com>

### ROLAND UK

Internet users browsing with Netscape 3.0 or Microsoft Explorer software (and audio capabilities on the Mac or PC) can visit Roland UK's web site to have a go on the MC303 Groovebox online. This new demo includes real-time audio playback: you can listen to one of five demos, alter filter parameters on the demos, try out the Real-time Phrase Sequencer, and mute and mix different parts to your heart's content.

**W** <http://www.roland.co.uk>

### MIDEM

MIDEM, the huge European music trade show, is now on the Internet. The new web site is in English and French, and provides comprehensive registration, accommodation

and attendee information. The real-world MIDEM takes place on January 19-23, at the Palais des Festivals in Cannes, France.

**W** <http://www.midem.com>

### BANDIT NEWSLETTER

Gremlins ate a couple of letters out of the Bandit A&R Newsletter website URL which we published last month. Our apologies to all concerned — here's the real address!

**W** <http://www.wightweb.demon.co.uk/bandit/>

### SIMKINS PARTNERSHIP

A law firm opening up a new web site wouldn't normally get coverage in *Sound On Sound*, but The Simkins Partnership specialises in the media. Thus their web site features information about getting National Lottery cash for movie projects, and a new royalties collection scheme for writers and music publishers — check it out!

**W** <http://www.simkins.com>

### ALLEN & HEATH

If you're after technical or product information for Allen & Heath mixers, visit the company's new web site. You'll also find news, a user forum and all the latest press releases.

**W** <http://www.allen-heath.com>

### A DEVIL OF AN OFFER

Demon Internet — claimed to be the largest provider in Europe — has announced that all of its Tenner-a-Month (TAM) customers will receive two *RealAudio* streams to bring sound to their home pages, free of charge. Demon's TAM customers already get 5Mb of web space free, and now they can easily add audio; two streams of audio means that two visitors will be able to listen to the audio on a home page simultaneously.

**W** <http://www.demon.net/>  
For information about *RealAudio*:  
<http://www.demon.net/realaudio/>

### BBF COMPUTER SERVICES

BBF Computer Services have launched a new, free web service for musicians. UK Live is a directory of bands and artists in the UK, classified by music type and location. The aim is to help new bands increase their profile with promoters as well as with the general public. A 'What Gigs Are On' service is provided, with gigs accepted up to a month before they are due to happen, and the Band Member listing brings together individuals who are looking to join a band.

**T** 01252 518815.  
**W** <http://www.worlddirectories.com>



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# YAMAHA

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



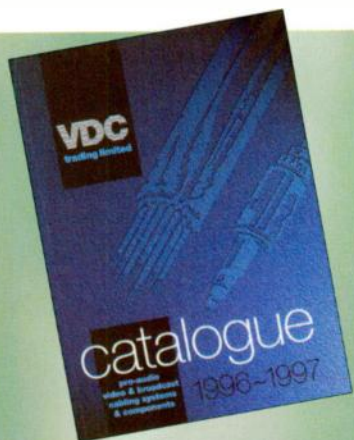
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# shape of things to come

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Our full Internet address is 100517.1113@compuserve.com.



## Damme fine Cable!

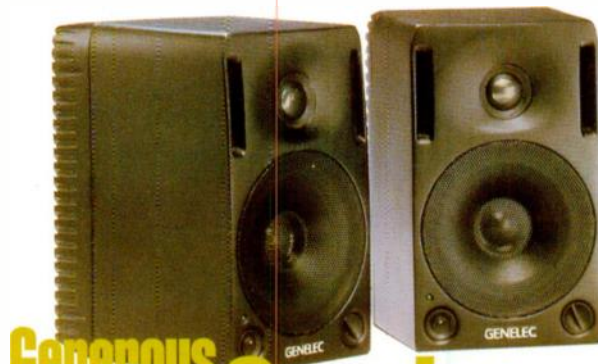
Cable specialists VDC have launched a new, free, 270-page catalogue that illustrates their expanded product range. Of particular interest to SOS readers is the successful Van Damme oxygen-free range of cable. The dizzyingly-large range includes single leads, looms and multicore systems, plus connectors, racks, mains distribution accessories and metalwork. The majority of products are fully illustrated and described in VDC's catalogue.

**A** VDC Trading Ltd, Units 1-3 43 Carol Street, London NW1 0HT.

**T** 0171 284 1444.

**F** 0171 482 4219.

**E** vdctrading@aol.com



## Generous Genelec

Last month, we just managed to sneak a mention into our letters page of Genelec's new affordable pair of powered monitors, which were launched at November's AES show in Los Angeles. The 1029A is a two-way, bi-amplified monitor, powered by a pair of matched 40W amps. It offers a frequency response of 68Hz to 20kHz from a 5-inch woofer and a 3/4-inch hard-domed tweeter. At £758 per pair, including VAT, these are the most accessible Genelec monitors ever, and for an additional £523, you can add the 1091A

sub-woofer. Again, this is self-powered, and is designed to interface seamlessly with the 1029As, extending the frequency response of the system down to 40Hz. So a complete, full-frequency Genelec monitoring system is now attainable for a sliver less than £1300 — and remember, you don't need to buy a power amp. Watch out for an SOS review in the very near future.

**A** Project Audio Ltd, 5 Castle Road, London NW1 8PR.

**T** 0171 428 9700.

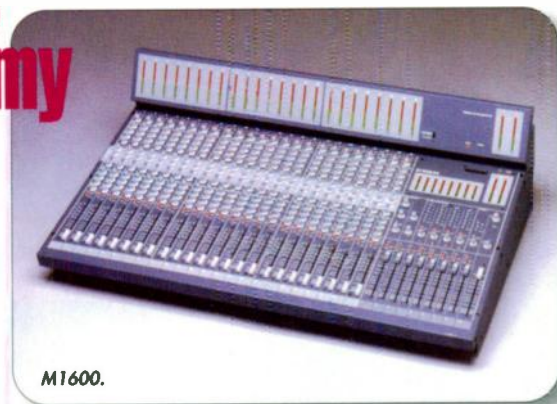
**F** 0171 428 9699.

**W** <http://www.genelec.com>

## Tascam's double whammy

Last month, we managed to slip in a small item about Tascam's new digital mixer, which was shown in prototype form at the AES show in LA. Further details aren't yet fully available, but we'll let you know when we know more.

What we do know about is a new pair of analogue desks from Tascam, designed to easily interface with the Tascam DA88 and DA38 digital 8-tracks. The in-line M1600 comes in 16- and 24-input versions, and features mic inputs on channels 1-8, each with switchable phantom power, 3-band EQ with swept mid, six aux sends, assignable stereo returns, mute swtch and insert points. Connection to a DA88 or DA38 is via 25-pin D-sub connectors, with lines for all direct and group outs as well as the tape returns; just six leads are needed, instead of the usual 48. Prices are an entirely respectable £1399 for the 16-input M1600, and £1699 for the



M1600.

24-input version. Options include the MA8 mic amp expander and a meter bridge.

**A** TEAC UK Ltd, 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA.

**T** 01923 819630.

**F** 01923 236290.

**W** <http://www.tascam.com> (under construction).

LCL Digital are a new company specialising in hiring out the Master System version of Studio Audio & Digital's SADIE PC-based digital recorder/editor. An operator can be provided if required. Within days of opening for business, LCL got involved in a classical CD project for the Royal Academy of Music, post-production on an Anglo-French film, and CD preparation for South London's Media Production facilities.

**T** LCL Digital 0171 359 1592.

COPS Replication of Beckenham have produced a pair of free 'how to' guides to CD replication and packaging. If you're new to CD manufacturing, these guides — which are essentially catalogues for COPS' services — could be very informative. *Successful Replication* explains all stages of CD manufacture, while *Wrapping It Up* illustrates the various types of packaging available.

**T** 0181 655 4560.

**E** [musicmanufacturers@cops.co.uk](mailto:musicmanufacturers@cops.co.uk)

**W** <http://www.cops.co.uk/cops/>

Kurzweil K2000/K25000 owners looking for sound sets in a modern idiom might be interested in World Control's *Ultra Control Trance*, 100 programs of Waldorf and NordLead programs, and *Ultra Jungle Kits*, 4.5Mb of sample program and keymap data, for £35 each (£40 each outside the UK). Demo songs using the sounds are provided, and a demo can be downloaded from the World Control web site.

**T** 0113 2469254.

**W** <http://www.u-net.com/~wcontrol>

Pure Energy's library of sample disks is now available for two more platforms: Emu's ESI32, and Korg's T-series of sample RAM-equipped synths. Disks cost just £5 each, including postage. Contact Big Time Productions for full details.

**T** 01782 810611.



At TDK, we believe that repetition puts an end to all art. That's why we know you can only accept the best for recording, editing, mastering, presenting and archiving your performance. For this reason, we developed TDK STUDIO products, a range of digital audio media providing flawless recording characteristics and uncompromising reliability. From now on, there will be no repetition due to technical failure of recording media, so you can concentrate on your art first time, every time.



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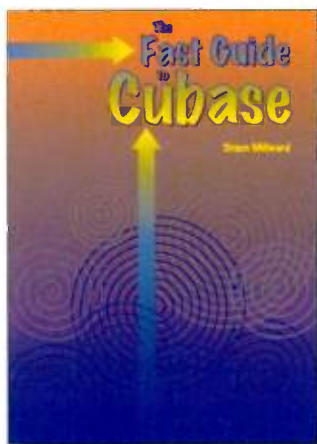
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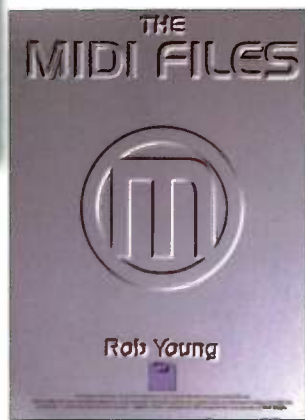


## Books Covered



There are three new books to tempt you this month, all available from SOS Bookshop. New from PC Publishing is *The Fast Guide to Cubase* by occasional SOS contributor Simon Millward. The book aims to provide a quick and readable introduction to *Cubase*, saving you the trouble of wading through the bulky user manual. All platforms are covered — PC, Atari and Mac — with useful tutorials, 'smart moves', glossary and index. There should be something in the book for everyone, whether you're a beginner or established user, and all the program's essential elements are outlined, including the Arrange window, the Inspector, Key, List and Drum Edit, Quantise,

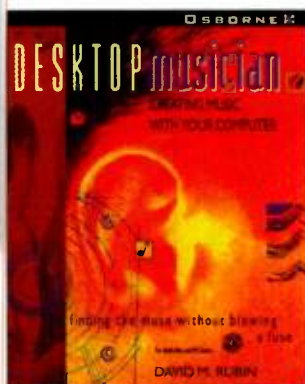
Synchronisation, Master Track, the MIDI Effect Processor and special chapters on Score and Logical Edit. *The Fast Guide to Cubase* costs £10.95, with an order code of B336.



*The MIDI Files* by Rob Young (B334, £19.95) comes from Prentice Hall and aims to help you get the most out of your MIDI system, by providing loads of tips on programming realistic instrument and rhythm parts, using sequencers to create advanced effects. Basic MIDI concepts are covered, along with advice on setting up a MIDI-based home studio. More advanced discussions cover specific types of MIDI messages

and what you can achieve with them. All the techniques in the book are illustrated on a supplied floppy disk.

The last new title this month is David M Rubin's *The Desktop Musician*, a comprehensive guide to MIDI and audio on PC and Macintosh computers. Purchasers are provided with a CD-ROM full of MIDI software demos to get them going, and the text — over 400 pages of it — covers all aspects of music and computers, from first concepts to advanced arrangement techniques.



Priced at £27.95, *The Desktop Musician's* order code is B335. Note that postage is extra for all titles.

- A** SOS Publications Ltd, Media House, Trafalgar Way, Bar Hill, Cambridge CB385Q.
- T** 01954 789888.
- F** 01954 789895.



## Sample shopping with Sounds OK

Specialists Sounds OK are to distribute a range of sample CDs, and have installed CD jukeboxes at a range of retail outlets nationwide. In the collection are dance loops, percussion disks, sound effects and sets of analogue synth samples. If you want to try before you buy, jukeboxes can be found at Andertons Music, Guildford; Gig Sounds, Streatham; Guitar Amp & Keyboard Centre, Brighton; Turnkey, London WC2H; Sound Control, Edinburgh and Newcastle; Musical

Exchanges, Birmingham; and Mark's Music, Ipswich. Contact Sounds OK for a full catalogue.

The company have also added a new Kurzweil K2000/K2500 sound disk to their range. The *Analog Dance* disk features 100 programs, some of which use a selection of Oberheim Matrix 12 samples. Most of the programs utilise data slider and mod wheel for added expressiveness. Bases, lead lines, washes and pads are all included for just £29, plus £2 postage and packing.

- A** Sounds OK, 10 Frimley Grove Gardens, Frimley, Camberley, Surrey GU16 5JX.
- T** 01276 682313.
- F** 01276 682717.

Opcodes' *Musicshop* has gone cross-platform with version 2.0, giving both Mac and PC users the same feature set. New facilities common to this entry-level sequencing package include real-time editing, 32 tracks with 32-channel automated mixer, WYSIWYG print preview, refined quantise controls, support for QuickTime Musical Instruments (Mac only), Opcode *Galaxy* patch librarian compatibility and on-line help via the Internet (Windows only). For a limited time, the upgrade and new retail purchases will include 100 royalty-free General MIDI songs. The *Musicshop* upgrade is available to all registered *Musicshop* and *EZ Vision* users.

- T** MCMXCIX
- 0171 723 7221
- W** www.opcode.com

With regards to our item in the November issue of *SOS* about Infusion Systems' nifty sensor-to-MIDI rig, a couple of inaccuracies crept in. We're happy to put the record straight. First of all, the i-Cube System (at US\$595) includes six sensors and two actuators for the purchase price, though you can buy the i-Cube Digitiser controller alone for US\$445. We also confused the Canadian and the US price for The Touchglove, which actually sells for US\$198.

- A** Infusion Systems Ltd, 1320 East Georgia Street, Vancouver, BC, V5L 2A8 Canada.
- T** 001 604 253 0747.
- F** 001 604 253 0747.
- E** info@infusionsystems.com
- W** http://www.infusionsystems.com

ACE MIDI File and sequencer building block producers Heavenly Music Productions are launching a backing track service for musicians who balk at taking computers, sequencers or tape decks on the road. If you find yourself to be more reassured with the idea of using a CD, DAT or MiniDisc player on stage, Heavenly are now able to supply MIDI Song Files in any of these formats. Contact them with your requirements. Heavenly are also about to release one MIDI file collection of Elvis Presley classics and two of Carlos Santana material: all three are GM/GS/XG compatible, and cost £24.99 per collection, including postage and packing.

- T** 01255 821039.
- E** heavenly@ortiz.demon.co.uk
- W** http://www.ortiz.demon.co.uk

Emagic's ZAP — the zero loss audio packer — is now available for the Mac, and is somewhat cheaper than when it was first announced. The software, which provides up to 50% compression of digital audio files with 100% bit accuracy upon restoration, now costs just £69 including VAT, a £30 saving on the original price.

- T** 01462 480000.



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**O**



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Web: <http://www.demon.co.uk/arbiter>

**DigiTech**



Classical music MIDI File producers Words & Music have released nine new disks, bringing their range to 19. New files include Dvorak's *New World Symphony*, Tchaikovsky's *1812 Overture*, Mussorgsky's *A Night on the Bare Mountain* and Beethoven's *Symphony Number 5 in C Minor*. Also available is Bach's *Well-Tempered Clavier Book 2*, a companion disk to *Book 1*. Full details of Words & Music's disks can be found in their informative new catalogue; disks start at £12.95 each, but bulk discounts mean that if you buy nine disks, you only pay for six, plus £1 postage within the UK.

**T** 01670 519589.

In collaboration with TEAC, Tekdata have introduced what they claim is the world's fastest IDE CD-ROM drive — the 12X CD512E. The new drive delivers a sustained data transfer rate of 1800K/second, which makes it particularly good for audio or video playback. Use of Constant Linear Velocity technology means that this transfer rate is constant from any location on the disk.

**T** 01782 577677.

Shepperton Film Studios have added to their pair of Akai DD1500 digital audio workstations with a further two. Until recently, Shepperton hadn't standardised on any digital hard disk system, hiring whatever was required, but they're now committed to the DD1500, with one installed in each dubbing theatre. The choice was down to a combination of ease of use, flexible synchronisation and wide media support — removable hard disks, magneto-optical disks and Exabyte data backup are available in every theatre.

**T** Akai UK 0181 897 6388.

PC games manufacturer Gremlin Interactive have bought a SADIE disk editor for their audio dubbing and sound design suite. The company are aiming to provide better audio for gamers, and use their SADIE for all sound and spot effects. ITV's *The Chart Show* is another convinced SADIE user — a system was purchased specifically as part of the show's recent 10th anniversary revamp.

**T** Studio Audio & Video  
01353 648888.

**E** 100566.132@compuserve.com

## Alesis' lucky numbers

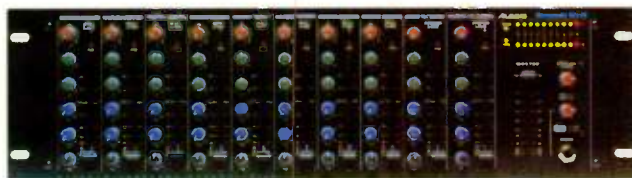


**A**lesis' range of studio gear has been expanded by two, with the addition of the Point Seven nearfield monitors and the Studio 12R rack mixer. The Point Sevens (£249) are fully shielded, for use near video monitors in computer, video or multimedia situations, and can handle a creditable 50W RMS program, 100W peak, into a nominal 4Ω. Two drivers are used: a 5.25-inch low-frequency driver, and a 1-inch, silk-dome tweeter, with a crossover frequency of 2kHz. Connectors are gold-plated, five-way binding posts, and each monitor weighs just 11 pounds. Frequency response is quoted as 85Hz to 27kHz.

The Studio 12R, not surprisingly, is a rack mixer. It features 12 inputs altogether,

configured as eight mono inputs (each featuring a "studio quality" mic preamp) and two stereo channels. All eight mono channels, plus the two stereo channels, offer a trim control, 2-band EQ, two aux sends (one post-fader, one pre-fader), a pan pot (balance on the stereo channels), and a 60mm fader. Balanced XLR and jack inputs are provided for all eight mono channels, which also feature an insert point. Additional inputs come courtesy of a stereo auxiliary return, and a stereo phono tape input. On the output front, there are balanced main and monitor outs, plus a duplicate main output on phons. As of

press time, no price for the Studio 12R had been set.



**A** Sound Technology plc,  
Letchworth Point, Letchworth,  
Herts SG6 1ND.

**T** 01462 480000.

**F** 01462 480800.

**W** <http://www.soundtech.co.uk>

## Topaz rocks on

**S**oundtracs have announced some additions to their Topaz range, with three new 4-buss consoles.

• The Topaz 12:4 (£411) features 3-band EQ, two auxiliary sends, four mono mic/line inputs, four stereo line inputs and two stereo aux returns — a total of 16 inputs. All inputs have solo and mute controls, and the desk offers two sets of stereo busses. The 12:2 can also be rackmounted with an optional kit.



• The £529 Topaz 14:4 adds to this feature set with 10 phantom-powered mic preamps; it has 10 mono inputs, plus two stereo input channels.

• Top of the new range is the £821 Topaz 24:4, which adds 10 further mic preamps to the 10 supplied on the 14:4;

it has 20 mono inputs, plus two sets of stereo inputs, and is not rackmountable.

**A** Soundtracs plc, Unit 21D,  
Blenheim Road, Longmead  
Industrial Estate, Epsom,  
Surrey KT19 9XN.

**T** 0181 388 5000.

**F** 0181 388 5050.

**E** [sales@soundtracs.co.uk](mailto:sales@soundtracs.co.uk)

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Our full Internet address is 100517.1113@compuserve.com.



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Korg UK, 9 Newmarket Court, Kingston,  
Milton Keynes MK10 0AU,  
or call our brochure line on 01908 857150.





shape of things  
to come



Tri,  
tri, tri  
again...

**E**vent Electronics' new Tria tri-amplified monitor system aims to provide "full-sized direct field monitor performance in a smaller format", for use in compact audio or production environments. The three-piece system includes a floor-mounted station housing five separate amps, active crossovers, a full set of calibrated trim and level controls, gold-plated input and output connectors and a

floor-loaded, 8-inch, very low-frequency driver. The system is completed by a pair of desktop speaker cabinets, which house a 5.25-inch driver and 1-inch neodymium soft-dome tweeter; the MDF boxes are front ported and magnetically shielded. Frequency response is quoted as a creditable 45Hz-20kHz.

**A** Key Audio Systems Ltd, Unit D  
Chelford Court, Robjohns Road,  
Chelmsford CM1 3AG.

**T** 01245 344001.

**F** 01245 344002.



## Pinnacle reaches new heights

**T**urtle Beach's latest soundcard, the MultiSound Pinnacle, offers Windows 95 Plug and Play capabilities and full duplex operation for simultaneous record and playback. Pinnacle also features 2Mb of Kurzweil wavetable ROM, including digital effects, and room for up to 48Mb of RAM. An optional digital input/output daughter board allows for improved audio transfer with zero generation

loss. The board is targeted at pro, semi-pro and audiophile markets, with 20-bit converters. MultiSound Pinnacle is MPU401-compatible in hardware, but not SoundBlaster-compatible.

**A** Et Cetera Distribution,  
Valley House,  
2 Bradwood Court,  
St Crispin Way, Haslingden,  
Lancs BB4 4PW.

**T** 01706 228039.

**F** 01706 222989.

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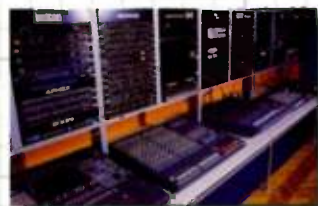
Turnkey's revamped and enlarged demo facilities feature what we believe to be the world's largest digital comparator systems for pro audio\* and the only one of its type in the U.K.

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

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

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

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



One side of the switcher-equipped recording room.



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Pro-Tools III and Soundcraft DC2020 in Studio 1.



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





Original model shown - new version will also feature LCD screen, alpha dial and four soft buttons.



# THE SOUND RETURNS!

In synthesis there's no bigger name than Moog, and no-one's products have a bigger reputation. As their products went out of fashion with the digital fad in the early eighties, so the company disappeared - but now they are back with a vengeance, bringing you the classic synth sound, with all the advantages of modern MIDI control and top build quality. The MiniMoog is back!

3 VCO's, each with a choice of six waveforms, combined with the juiciest of filters give you the fattest sounds around. All the rest of the MiniMoog's original functions are still there for super flexible sound creation. All controls send out MIDI continuous controller data, so any edits you make can be recorded into your sequencer and played back. There's even an external input for processing any other sounds with the Mini's comprehensive synthesis.

Like the original, the new model will be built from real wood, finished in either birch, or for a small premium, walnut. For the die hard purists amongst you, you can even order the Mini to the exact original spec with no MIDI!

If you just have to have the ultimate in control, also available are fully customisable modular systems, starting from only £3695 - try buying an original Moog Modular for that!

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## BIG

by Langley

## AMEK

As newly appointed Amek dealers we now have on demonstration a fortyfour input Big by Langley console. The Big's SuperTrue Version 3.1 VCA automation compatible with all other Amek desks up to the flagship Neve 9098 series console. With the Virtual Dynamics on-screen processing

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

- 4 band EQ, 8 Auxiliaries
- SuperTrue V3.1 VCA Automation
- Virtual Dynamics on-screen editing
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- 12 bus, 24 output
- Frame sizes from 28 to 44 inputs

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# Lexicon

## MPX I



# LEXICON PRICE/QUALITY BREAKTHROUGH

For those of us who need top quality reverb & multi FX but cannot stretch to the expense of the PCM80 & PCM90, Lexicon have released the MPX-1. Featuring the famous 'Lex' chip for reverb and separate DSP processor for multi FX, the MPX-1 brings you all that is good in signal processing for an incredible £1199 inc VAT!

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- SPDIF digital i/o

Up to 5 simultaneous effects are available including pristine quality stereo pitch shifting, and effects can be "morphed" from one algorithm to another, as pioneered in the Vortex. An all new operating system which includes on-line help and a databasing system for sorting presets, means that achieving quality results is as stress free as possible.

Initial supplies of this exciting new product will be very limited - get your order in now to avoid disappointment.

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# 1066 dbx



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 Tel 0171 240 4036

# Green range Focusrite



Focusrite have long represented the pinnacle of audio achievement, but sadly their products have always been out of reach for most of us. Now, specifically with the high quality project studio in mind, they have designed the Green range of processors. The first 3 products are the Dual Mic Pre, the Focus 4 band EQ with filters, and the Voicebox - this combines a mic/instrument preamp, compressor, de-esser and parametric EQ in a single unit - the ultimate signal path for digital recording! All 3 are on permanent demo at Turnkey.

**FOCUSRITE GREENS FROM**  
**£819**  
 CALL FOR A DEMO/RENTAL  
**turnkey**  
 PROFESSIONAL  
 Tel 0171 240 4036

# VTP-1 DigitalTech



DigitalTech have already taken the pro market by storm with the introduction of the Studio Vocalist, and now the 2 channel VTP1 tube mic amp / EQ looks set to do the same. It combines four bands of semi parametric EQ with a high definition mic amp based around a proprietary valve design. The usual phase reverse, high pass filter, 20dB pad (line inputs also available) and 48v phantom power are provided, together with high quality balanced analog outputs, and AES/EBU and SPDIF digital outputs at either 44.1 or 48 kHz. The ideal front end to any digital recording system.

**NEW**  
**£999**  
**NEW BOXED**  
**turnkey**  
 PROFESSIONAL  
 Tel 0171 240 4036

# NEW Indigo Range TL Audio



In the production of modern valve audio equipment, the success of TLA equipment has been unrivalled, from the best selling compressor, to the full blown valve mixer. For those of you who don't quite need the full functionality of the existing range, the

new 1U high Indigo range has been designed specifically for your needs. Superb warm and fat valve signal processors at an affordable price. Models include a compressor, EQ, mic amp and overdrive unit. Entire range on demo at Turnkey for direct A/B comparison.

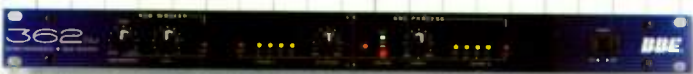
**PRICES FROM**  
**£699**  
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# BBE

## MAXIMISE YOUR MIX!

No mix is complete without some sort of psychoacoustic processing these days, and the BBE sonic maximizers have a unique angle in this department, with a process quite unlike any other unit. Rather than using harmonic regeneration, the audio spectrum is split into various



- Full Range Process Covering High & Low Frequencies
- Large Range of Models for all Applications
- Suitable for Studio & Live Use
- Killer Sound!

regions and phase shifted apart, which can have devastating results - particularly at the bottom end. Unlike harmonic regeneration, phase shifting doesn't generate feedback, so they're also great for live use. Check out the full range below - there's sure to be a model to suit you!

### 362 Sonic Maximizer

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

**362**  
**£199**  
 NEW BOXED

### 362NR Sonic Maximizer + Noise Reduction

The 362NR combines a full-featured sonic maximizer with an independent, single-ended noise reduction system in a single rack-space unit.

**362NR**  
**£269**  
 NEW BOXED

### 362SW Sonic Maximizer + Sub Woofer Control

The 362SW combines a full-featured sonic maximizer and an independent subwoofer control with a variable low-pass filter and output level control.

**362SW**  
**£269**  
 NEW BOXED

### 462 Sonic Maximizer

The 462 is perfect for semi-pro applications not requiring balanced jacks. With true dual-mono operation, the 462 is two independent sonic maximizers in one chassis.

**462**  
**£269**  
 NEW BOXED

### 862 Sonic Maximizer

The 862 unit features dual-mono operation with balanced XLR inputs and outputs. It is designed for applications requiring low noise, high headroom and +4dBu input levels.

**862**  
**£469**  
 NEW BOXED

## HR-GP5 MULTI FX PROCESSOR

Acclaimed quality multi-effects unit from Sony, brother of the HR-MP5. The same processing split further allows up to 7 effects at once with a fantastic range of reverbs, delays and more "off the wall" effects, plus a superb pre-amp section making it ideal for both studio use and guitarists. It features the same display and operating system as the MP5, so nothing could be easier to use! With our massive discount stocks won't last long, get your order in now!



- Top Quality Effects Processor
- Exclusive End of Line Clearance Deal

RRP £686  
**£249**  
 NEW BOXED

## SPIRIT Folio RacPac

- 28 Inputs at Mixdown
- 6 Auxiliary Sends
- 4 True Subgroups
- 3 Band EQ with Mid Sweep

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



RRP £899  
**£469**  
 NEW BOXED

## IT'S BACK!

### Vortex



Despite the first digital effects units being developed almost 20 years ago, they have all followed a familiar path ever since, offering a conventional series of effects. The Lexicon Vortex breaks the mould in allowing effects to be morphed between in real time and in the process, creating new and previously unheard of effects. (This actually changes the effect algorithm continuously - it is not a simple cross-fade between effects) This unit is ideal for dance music, and anybody requiring out of the ordinary effects, and its real time nature make it an excellent choice for live performers such as guitarists. Effects are also affected by the input signal, so that dynamics can control various different parameters within an effect algorithm.

- Unique morphing of effects
- Typical Lexicon quality
- Superb realtime control

RRP £425  
**£199**  
 EXCLUSIVE DEAL

## SPIRIT Folio Lite

- Up to 16 inputs to mix
- 2 Aux sends, 1 switchable pre/post
- 4 mic amps with phantom power

Soundcraft's Spirit Folio must have more features per square inch than any other mixer. Ideal for any small recording setup, it has up to 16 inputs including 4 mono mic/line channels (with phantom power), 4 stereo channels and 2 returns, 2 band EQ and 2 aux. sends = 1 switchable pre or post fade. If you need to rack it, optional ears are available. *Mega deal only at Turnkey!*



RRP £312  
**£199**  
 NEW BOXED



# YAMAHA

## ProMix 01



- 18 Channels of 20bit Digital Mixing
- Full Dynamic Automation
- Built-in FX Processors & Assignable Dynamics
- 3 Band Fully Parametric EQ with Library

## DIGITAL MIXING FOR THE MASSES

Yamaha's ProMix 01 revolutionised the mixer market overnight when it was introduced around 18 months ago, bringing digital mixing to the masses.

16 line inputs (8 have mic amps with phantom power), and 1 stereo input each have their own motorized fader, as does the master fader and a dedicated send / return fader. Each channel features 3 band fully parametric EQ, 2 external auxilliary sends, as well as 2 internal sends to the built in multi FX processors. There are also 3 'floating' stereo dynamics processors, with their own library of gates, limiters and compressors - you can even key them from adjacent channels!

As if all this wasn't enough, all parameters are fully automatable, either via MIDI, or using the built in snapshot system. Superb audio quality throughout is ensured, with 20 bit AD / DA converters and a master digital output for direct connection to DAT machines, HDR's etc. This incredible price only at Turnkey makes the ProMix 01 even better value than ever!

RRP £1999  
**£1649**  
NEW BOXED

## Yamaha 02R Digital Console

# YAMAHA



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

RRP £6999  
**£POA**  
turnkey  
PROFESSOR  
Tel 0171 240 4036

## DTC-A6

# SONY



## DAT MACHINE

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

RRP £689  
**£599**  
NEW BOXED

## ADAT XT

# ALESIS

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

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

Turnkey are probably the most experienced suppliers of ADAT's, which coupled with our unbeatable pricing makes us the first choice for the new XT.



RRP £3199  
**£POA**  
PACKAGE DEALS AVAILABLE  
turnkey  
PROFESSOR  
Tel 0171 240 4036

## TCD-D8

# SONY



## PORTABLE DAT MACHINE

Turnkey bring you the first stocks of Sony's brand new portable, the TCD-D8. Sturdily built with a back-lit display, the unit features 48kHz and 44.1 kHz analog and digital recording.

No other portable is available under £1499 - Initial supplies will be very limited, phone now to reserve yours. The ultimate Walkman!

RRP £599  
**£529**  
NEW BOXED





## THE TAHITI IS DEAD - LONG LIVE THE PINNACLE !

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

At £479.00 (including VAT), the Pinnacle may not seem like good value at first, but consider that a Tahiti with a synth daughter board would have been over £400, and that the Pinnacle offers SampleStore, the technology which lets you treat your own recorded samples as MIDI instruments - the advantage is clear.

Digital Orchestrator is fast becoming the sequencer of choice around the £100 mark, since it isn't a cut-down "crippleware" version. A CD-ROM version is included free!

Windows Plug 'n' Play means that installation problems could be a thing of the past, and the optional S/PDIF board (£99) makes digital connection to your CD or DAT possible at an unheard-of price.

U.S. company Turtle Beach have long led the way in the Soundcard business, and their current range caters for the needs of everyone from the beginner to the serious PC music producer.



- 20 BIT DAC / ADC
- Enhanced or Std Duplex
- Sample Store (up to 48 Meg)
- Kurzweil Wavetable synth
- Windows95 Plug 'n' Play™
- Up to 48 MIDI channels
- WaveBlaster™ connector (for DB50)
- Optional S/PDIF daughterboard
- Windows95 Plug 'n' Play™
- Comes with Digital Orchestrator+ (mp £129)

COMPLETE SPEC ON OUR WEB SITE:  
<http://www.turnkey.uk.com>



**PINNACLE**  
**£479**  
 INC. FREE  
 DIGITAL  
 ORCHESTRATOR  
 PLUS

**MUSICATOR**  
 MUSICATOR AUDIO  
**£249**  
 WHEN PURCHASED WITH A PINNACLE

**3VE**  
 ONKIBLK PRO A/D  
**£249**  
 WHEN PURCHASED WITH A PINNACLE

**Logic**  
 LOGIC AUDIO  
**£349**  
 WHEN PURCHASED WITH A PINNACLE

**CLIBASE**  
 version 3.0  
**£249**  
 WHEN PURCHASED WITH A PINNACLE

### JV1080 Super JV Module

In the same way as the S1000 became the industry standard sampler, Roland's JV1080 has become the industry standard synth module. It's not hard to see the reason why - straightforward operation combined with top flight sound quality and a huge range of useable sounds.

But expandability of the machine is where it really comes into it's own. There are over 10 different expansion boards which can be fitted (up to 4 at once), each one with as much ROM as the original machine, covering sounds from Vintage to Orchestral and Dance to World.

At Turnkey we have the full range in stock, as well as an unbeatable price on the machine itself. Check one out today!

RRP £1199  
**POA**  
 NEW BOXED

RRP £1498  
**£1299**  
 WITH ANY EXPANSION BOARD

### S4 Plus

## ALESIS

Unbelievable clearance deal on this top of the range synth brings you a huge range of features and serious performance at a bargain price. The Alesis S4 Plus Piano features: 64 note polyphony, 16 part multitimbrality, a huge range of up to the minute sounds and large area of the ROM given over to top quality piano samples, the ability to download samples onto PCMCIA RAM cards, 4 simultaneous multi effects processors based on the Quadverb 2, huge screen for easy editing and packaged in a 1u rack unit, with plenty of knobs and buttons for editing. Under half price! Limited quantity available - first come, first served!

- 4 Simultaneous FX Processors
- 64 Note Polyphonic
- Massive LCD Display
- Under Half Price!

RRP £995  
**£499**  
 EXCLUSIVE DEAL



# Technics

## TECHNICS SX-WSA1 keyboard workstation



We're famous for bringing you quality products at a huge discount - but this one takes some beating! Launched last year, the Technics WSA1 was hailed as a breakthrough instrument, bringing the latest physical modelling technology to the market with 64 note polyphony, when other manufacturers were and still are offering only 1 or 2 notes.

Now as the UK's leading hi-tech music store, our tremendous purchasing power allows us to offer you these superb instruments at discounts of well over 70%!

The WSA1 produces it's sounds by feeding a PCM waveform driver into a custom DSP modelling resonator, and unlike other systems offering just 1 or

## DEAL OF THE YEAR!



2 models, the WSA1 has a whole host of them including string, cylinder, cone flare, plate and membrane, and there are two per tone (up to 4 tones per note). Parameters like fit, mute and position allow incredible modelling flexibility. Sound is then fed through a digital resonant filter stage, and amplitude envelope. To top the whole lot off, there are three FX busses with 55 different algorithms, and digital EQ.

MIDI files only) which handles 10 songs, 16 tracks and 47,000 notes with full graphic note editing - probably the best workstation on the market.

Amongst other features are 32 part multitimbrality (2 sets of MIDI in, out and thru) and 4 individual outputs expandable to 8 plus SPDIF digital out (only £168).

Ease of use and programmability is also unparalleled for a modelling system, the huge backlit display gives graphic representations of all editing parameters, whilst the array of modulation wheels and trackball type devices give unrivalled realtime control, and also offer a simple approach to new sound creation.

Once in a lifetime opportunity to own a true quality instrument at a giveaway price.

Buy now whilst stocks last!

The keyboard version has a disk drive and sequencer (disk drive on rack plays files sounds and plays standard

## TECHNICS SX-WSA1R Rack module



- "The quality, scope and inventiveness of the programming are extremely impressive" - Keyboard Review
- "Technics have obviously put a lot of tender loving care into the WSA1 sounds" - Sound on Sound
- "A very comprehensive keyboard. Is there a catch? Not in my book." - Making Music
- "A ground breaking sophisticated instrument" - Making Music
- "The sequencer is outstanding" - Future Music
- "The drums are excellent" - Sound on Sound
- "All the hype was justified" - Future Music

RRP £2199  
**£649**  
SX-WSA1R

RRP £2499  
**£869**  
SX-WSA1



## Roland MC-303 Groovebox

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

NEW PRODUCT  
**£549**  
NEW BOXED

NEW PRODUCT  
**£649**  
WITH MK149 CONTROLLER KEYBOARD

## PULSE



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

NEW PRODUCT  
**£599**  
NEW BOXED

## Red

Although Waldorf are not associated with Focusrite in any way, we cannot deny that this Wave is red.



## Waldorf Wave

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

EXCLUSIVE FROM  
**£6299**  
CALL FOR DETAILS  
turnkey  
Tel 0171 240 4636

## CS1x



Here's another fantastic addition to this year's slew of equipment specifically designed for dance music. Not only does it look great, it sounds great too! As well as 480 XG format voices and 11 different drum kits, the CS1x also has 128 special performance sounds especially designed for dance and techno music. Front panel knobs allow instant access to crucial editing parameters like the filter, and 2 are assignable to anything you like. Round this off with top quality effects and an arpeggiator, and you have what has to be the best value keyboard of the year!

RRP  
**£599**  
NEW PRODUCT



# HAMMOND

## THE B3 LIVES AGAIN!



The XMI is an amazing sounding all new organ module, and has its own remote drawbar controller, the XMIC. Based on the guts of the £8000 XB3, there is nothing as realistic as this on the market - it has been specifically designed to recreate the sound of the legendary B3.

Featuring a built in Leslie simulator and overdrive, up to 3 registrations simultaneously, variable release envelopes, percussion and 128 presets, you're sure to find the sound to suit in seconds. 3 part multitimbrality means you can realistically recreate 2 manual and pedal parts, whilst the remote control offers superb programming flexibility from the top of any controller keyboard, as well as making it perfect for live use.

- The Most Realistic B3 Simulation Around
- Drawbar Remote for Programming Ease
- Built in Leslie Simulator

Exclusively supplied by Turnkey.

**NEW PRODUCT**  
**£1089**  
**NEW BOXED**



### SyQuest & IOMEGA

#### Removable disk drives

There was a time when hard disks were a luxury for sampler owners, but with the advent of the ultra cheap Iomega Zip and Jaz drives, and the new Syquest EZ Flyer, this has become a thing of the past. For under £200 the Zip drive stores 100Mb (94Mb formatted) on each cartridge and the EZ Flyer 230Mb (224Mb formatted). If you want greater capacity the Jaz's 1Gbyte will suit any large fx library and is ideal for many dedicated hard disk audio systems like the Emu Darwin or Akai DR series.

**ZIP**  
RRP £219  
**£149**  
INC DISK & SCSI CABLE

**JAZ**  
RRP £649  
**£469**  
INC DISK & SCSI CABLE

**NEW EZ-FLYER**  
**£239**  
INC DISK & SCSI CABLE



### Apple Macintosh

#### MIDI Bundles

While stocks last we are offering Apple's Powerful Performa CPU with a MIDI sequencer of your choice - Steinberg Cubase, E-Magic Logic, Opcode Vision or Mark of the Unicorn's Performer. Comes with 1-in, 3-out MIDI interface.



**BUNDLE PRICE**  
**£1099**  
INCLUDING SOFTWARE

Performa 630 MIDI Package:  
• Performa 630 8/350CD clw kbd.  
• 14" Colour Display  
• MIDI Sequencer + Interface  
• ClarisWorks Software

\* CPU Apple 8 stubb - full warranty

### SU10 Sampling Unit

### YAMAHA



Yamaha's SU10 is a ground breaking unit, making professional quality stereo sampling available to everyone. Up to 54 seconds of sampling is available and 48 samples can be held in memory at any one time. Samples can be filtered, reversed, scaled, crossfaded, pitchshifted and even scratched using the ribbon controller.

The built in sequencer means you can produce your own tunes using just this unit! The SU10 comes bundled with 2 free Time & Space CDs containing almost 800 samples. Also available with 4 octave MIDI keyboard for only £349.

RRP £285  
**£269**  
INCLUDES 2 FREE TIME & SPACE CDs

### MixPad 9

### SAMSON AUDIO



A rugged compact mixer packed with professional features including 2 mic/line and 3 stereo inputs, 2 auxs, 2 stereo returns, 2 band EQ, phantom powering and balance outputs.

With its superior low noise performance and high 27dBu headroom, this is the perfect mixer for small digital set-ups or high quality submixing in larger systems.

With this Turnkey megadeal no other mixer offers these features at this price. Limited stocks only.

RRP £185  
**£129**  
NEW BOXED



# EUROPE'S LOWEST PRICES GUARANTEED\*

### Sound Modules

#### WALDORF MICROWAVE

TURKEY EXCLUSIVE DIRECT EXCLUSIVE

The Waldorf Microwave has genuine analog synthesis including resonant filters. It has 16 oscillators, 8 part multi-timbrality and 8 individual outputs. Sweep through up to 64 different waves, controlled by LFO's, envelopes etc. Densifying bass, totally unique sound! Also available on a small basis please enquire - once you've tried this, you won't want to go back!

**SPECIAL £1199 NEW BOXED**

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#### F.A.T. FREEBASS

FB-303 TB303 CLONE

Superb first product from new manufacturer Freedom Analog Technologies. The only authentic sounding TB303 clone with MIDI I/O rack with 1 knob per function, all the sound control of the 303 is duplicated. Cutoff Resonance, Envelope Mod, Accent, Tune and Decay. Waveform is continuously variable from square wave to sawtooth, and an auto tune button is included to return the oscillator. Filter cutoff CV controllable (connector box available only £40 if bought with F83R). The ultimate analog bass machine - this incredible price means there will fly out of the door! Turkey Exclusive.

**NEW PRODUCT £199 NEW BOXED**

#### NOVATION BASS STATION

BUGGY MONO SYNTH

If you need to get into analog synths on a budget, then the Bass Station rack or keyboard is for you! But this is no mere toy! Two oscillators, pulse width modulation, LFO's and knobs that send out MIDI information make this a versatile sound creation tool, capable of a wide range of bass sounds and effects. The ideal addition to any MIDI setup!

**FROM ONLY £329 NEW BOXED**

### The UK 4 track CD

Our famous 4 track pack includes everything you need to start making music. Multi-effects headphones, microphone with cable, chrome tapset, cables, head-earphone kit and the bass book we've yet seen on multitrack recording. LFO's and knobs that send out MIDI information make this a versatile sound creation tool, capable of a wide range of bass sounds and effects. The ideal addition to any MIDI setup!

**RRP £299 NEW BOXED**

#### PORTA 03 Mk2

INC 4 TRACK PACK

New version of a classic portable. Improved styling and mitting!

**RRP £299 NEW BOXED**

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#### FOSTEX XR3-III

INC 4 TRACK PACK

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

**RRP £249 NEW BOXED**

#### FOSTEX XR5 Personal Studio

INC 4 TRACK PACK

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

**RRP £420 NEW BOXED**

#### FOSTEX XR7 Personal Studio

INC 4 TRACK PACK

The XR7 breaks new price and performance - 6 inputs (2 mics), 2 separate mix sends, low-cut, 4 speed mid EQ, records up to 8 tracks at once - double speed recording, Dolby C.

**RRP £499 NEW BOXED**

### ACCESS PROGRAMMER

FOR MATRIX 1000 DR MICROWAVE

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

**SCOOP EXCLUSIVE £369 NEW BOXED**

#### KORG 05RW

TOP QUALITY GM MODULE

Best selling General MIDI module from Korg. 7000 note polyphony, direct to host computer connection and special 'Combi' mode for stacking presets up from some truly huge sounds!

**RRP £499 NEW BOXED**

### E-MU CLASSIC KEYS

(THE BEST EVER DR RHYTHM)

8 Meg of Memory Keys samples 2 independent stereo effects units, 32 note poly, what more can be said. Ideal for anyone needing great vintage sounds without the hassle of an analog synth. Satisfaction guaranteed, unbeatable price.

**RRP £499 NEW BOXED**

#### BOSS DR-660

THE BEST EVER DR RHYTHM

BOSS have been making Dr Rhythm drum machines since the very beginning, combining value for money with ease-of-use with the latest drum and percussion sounds. The DR-660 builds on the success of the DR-550 MK2, but offers 16 full velocity and aftertouch sensitive pads, 4 separate out (beats-of-at-a-time), and 255 drum sounds including the best of TAB08 / 909. The 660 also boasts the 'human feel' control first introduced on the RB which allows velocity to control a realistic crossfade between several waveforms (for example, whereabouts the cymbals are hit). Process your sounds with on-board digital reverb and chorus - fully editable, with individual effect-send control for each drum sound.

**RRP £499 NEW BOXED**

### ALESIS SR-16

DRUM MACHINE

The SR-16™ Stereo Drum Machine is an excellent tool for songwriting and performance! It features a great selection of 233 realistic, natural drum sounds, offered both in dry form and sampled with our incomparable digital reverb. Alesis' exclusive Dynamic Articulation™ feature enables a drum sound to change its tonal content as it's played harder for truly realistic performances. The SR-16 features 50 preset patterns that were actually played in by top studio drummers - not just programmed and quantized. You'll find enough built-in rhythmic variations (with A, B and two Fill sections) for composing complete arrangements. Of course, the SR-16 also completely replicates MIDI implementation, a footswitch-implementable programming and editing features and velocity-sensitive pad buttons. Plus, it's so easy to use that you'll be up-and-running and composing new music in minutes.

**RRP £299 NEW BOXED**

### YAMAHA VL70M

VIRTUAL ACOUSTIC MONO SYNTH

Physical Modelling Synthesis for the first of its kind - Yamaha's ground-breaking new unit. Physical modelling takes a completely different approach to sound reproduction than any previous method - extremely powerful DSP chips simulate in real time characteristics of real instruments such as tubing size, length, damping, absorption, airflow pressure, throat characteristics, tongue and many others. The sound can then be passed through a powerful multi-mode filter-section with resonance, harmonic enhancer, amp/mic expander, resonator and five-band full parameter EQ with key-scaling abilities. Finally, a 32 bit effects capable of bringing up to 3 simultaneous effects processors into play including reverb, delay, distortion etc.

**NEW PRODUCT RRP £499 NEW BOXED**

### ROLAND MATRIX 1000 EXCLUSIVE

Now almost 10 years old, and still sounding as fresh as the day it was released, the Matrix 1000 is essentially a Matrix 8 in a rack - 6 note polyphonic, 2 oscillators per voice, true analog VCF filters with 8 modes, 'Matrix' modulation with 20 sources and 32 destinations, raw gung analog synthesis. Why 1000? The 1000 presets were generated by Matrix owners worldwide in response to a competition to find the best analog sounds on the planet. You're sure to find the perfect patch for virtually any application. Group mode allows chaining of up to 6 units to create a true PC or Atari edit (available for only £49).

**FACTORY DIRECT RRP £599 NEW BOXED**

### Sampling TIME & SPACE

THE BEST EVER DR RHYTHM

We have two Time & Space Junos in 12" - each fully loaded with the current top 100 CDs. There are 400 CDs to cover everything from straight instrumental sound through sound effects, to loops and breaks. We carry virtually the full range in stock and can also supply most titles in CD-ROM format for direct loading into your sampler. Come and check out the latest sounds today. From as little as £29.95.

### EMU E400

COME FROM A DEMO AND HEAR THE DIFFERENCE!

Building on the success of the E64 comes the E400 from EMU. As well as coming with 4 meg of RAM as standard and all the features of our award winning software, expandability is unrivalled with options including an extra 8 outputs, 32 MIDI channels, 18 bit dual stereo FX processors, and up to 128 note polyphony! Huge EMU CD ROM library available at Turnkey.

**RRP £2499 WITH FREE ZIP DRIVE & 8 MEG**

### EMU E-IV SUPER SAMPLER

EXCLUSIVE UK DEALER EXCLUSIVE UK DEALER

Our superb product knowledge and backup service have led Turnkey to be chosen by EMU as the UK's exclusive E-IV distributor. As well as 128 note polyphony sampler with great editing already, version 2.0 software and a range of new extra's have transformed the product. Version 2.0 features include 4 new editable 6 pole filter types (now 20); direct reading of Roland library as well as S1000, and the incredible SoundSpray technology from the E4K, allowing virtually instantaneous loading of sounds from disk. Also new are the FX board (RRP £329) giving 2 simultaneous top quality FX processors as in the E4K, and the 8 output board (RRP £799) giving an extra 8 balanced analog outputs bringing the total to an incredible 18! Our bulk purchasing allows us to bring you this incredible price.

**RRP £499 NEW BOXED**

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# Focusrite Green

## Preamp / Equaliser

*Though it's not exactly cheap, the Green Focus EQ brings professional quality within reach of the serious project studio owner.*

**PAUL WHITE** does the 'rite thing....

**T**he Focusrite Green range of processors offers a cost-effective alternative to the acclaimed Red range, and though it is still a premium product line, it is priced to appeal to serious project studio owners as well as professionals. Cosmetically, the Focus EQ has much in common with the Voicebox reviewed in the December issue of *SOS* — the front panel and case are combined into a single cast component, with the green anodised front panel peeping through the apertures in the curiously-sculpted black case. The transformer coupling of the Red range has been replaced by an electronically-balanced alternative, and the PCBs use surface-mount components so that manufacturing automation can be used to keep the build cost down. The circuitry, though, is pure Focusrite.

The Focus EQ combines a mic/line/instrument preamp (so that mic or line-level signals can be routed directly to tape without needing to go through a mixer) with a single-channel equaliser in a 1U-high

rackmounting unit. The XLR mic and line inputs and the line output are fully balanced and grounded to AES recommendations, while a further instrument-level (guitar) input is provided on an unbalanced jack. Mains power is via an IEC mains socket, and the operating voltage may be switched to 120V or 240V by means of a recessed, rear-panel slide switch.

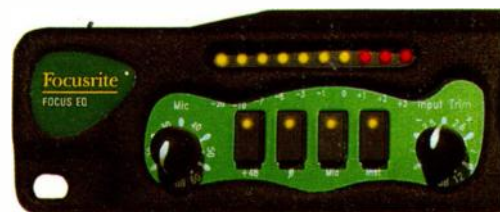
### FOCUS ON GREEN

At the front end is a very low-noise mic amp based around the Linear Technologies LT1028 mic amp chip used in the Voicebox. This provides 10-60dB of mic gain with switchable phantom power, and phase inversion; further Mic and Inst buttons (in various combinations) enable the user to select the Line input, the Instrument input, or the Mic input. Each of the buttons has a built-in status LED, and there's a 10-section LED level meter above the preamp controls to help in optimising the preamp gain. The Instrument or Line input gains are controlled by the Input Trim knob, from -12 to +12dB.

There are three different types of filter in the EQ section, where the first line of defence is an independently bypassable section comprising one high-cut and one low-cut sweepable-frequency shelving filter. These operate from 10Hz to 320Hz and 4.7kHz to 30kHz — anyone who's used a Drawmer DS201 with the filters in key listen mode will have a fair idea of what to expect. If you just need to trim some unwanted bandwidth from either end of the audio spectrum, these are the filters to do it.

The main part of the equaliser is configured as four bands; there are variable-frequency, variable-cut/boost filters at the extremes, plus two fully parametric mids. The low section can be swept between 30Hz and 470Hz, while the high shelving filter covers the 3kHz-18kHz range, and each has a switch enabling it to be set to either shelving or bell mode. In bell mode, it behaves as a conventional sweep-type equaliser, and up to 18dB of cut or boost is available in either mode. All the cut/boost pots have a positive centre detent.

Taking care of the mid-range are the two parametric sections, each of which may be switched to cover different frequency ranges. The x3 Frequency button causes the low section to span the range 40Hz to 1.2kHz, while the high section can span 600Hz to 18kHz. Between these two controls, the entire audio spectrum can be covered, with a useful degree of overlap. Each section may be varied



from a Q of 0.3 to 1.8, and the Q values are kept fairly low. A separate bypass button takes the main equaliser section out of circuit, independent of the high and low filters.

Unlike the equaliser built into the Voicebox, the Focus has true parametric mid sections, and the Q range seems to have been chosen for gentle, musical EQ rather than for radical notching. The available cut/boost range is probably more than most people will use, which is better than not having enough, but you do have to use it with care. The EQ on the high/low filter section is extremely powerful, and most sweetening jobs won't tax it at all.

At the end of the signal chain comes the output level control, which has an overload, clip-warning LED. Right next to it is a yellow LED set into the front casting, to show that the unit is on.

### GREEN SOUND

A good equaliser will have plenty of circuitry headroom, a smooth phase response and a good transient response. Many commonly-used ICs don't have the necessary power-bandwidth capabilities to do the job without introducing an unacceptable level of distortion, but Focusrite designs are properly engineered and use components equal to the task. Furthermore, although the mic amp might almost be considered an add-on, it still behaves impeccably.

Different EQ units all have their own character — some are hard and obtrusive, whereas others seem wishy-washy and never really get a grip on the sound they're working with. All too often, the result sounds coloured, unnatural, and sometimes even distorted in some way. Focusrite's EQ behaves as do most of the best EQs I've heard, in that it is quite assertive, but it doesn't create phasiness or unnatural coloration, even when you apply it generously. The original idea of EQ was to provide something that would act like a volume control in selected parts of the audio band, so that instruments could be lifted out of the mix, and that's exactly what this one does. When you turn up the treble, the impression is not so much that you've added treble, but more that the bright components of the mix have become louder. Similarly, you can

**pros & cons**

**FOCUSRITE FOCUS EQ £939**

**pros**

- Supremely transparent sound.
- Predictable, intuitive operation.
- Easy to spot in your rack!

**cons**

- No pre-EQ insert point.
- Control functions not immediately obvious, due to small print and lack of individual control names.

**summary**

Though not cheap, the Greens allow users to buy into Focusrite quality for considerably less than the cost of the Red range. This model sounds just the way you always hoped EQ would sound.

**SOUND ON SOUND**



# Focus EQ

input is also very valuable, but it suffers from the same limitation — many guitar and bass sounds work better when compressed pre-EQ. These minor criticisms aside, this EQ is a superb performer and its simplified format (compared to having fully parametric EQ in all bands) doesn't seem to compromise its usefulness, yet makes it quite easy to set up.



tighten up a bass sound without it spilling into the low mid or becoming flabby and unfocused.

For most applications, you'll only need a fraction of the available EQ boost, but even when heavy EQ is applied, the sound still retains its integrity. Particularly impressive is the way in which the Green EQ allows you to boost bass sounds and tighten them up at the same time.

Ergonomically, the only slightly weak point of this unit is that it's not always obvious which knob is which — the legending is quite small and the individual controls aren't named, so you have to figure

out their function from their units of calibration. Even so, it doesn't take long to learn your way around.

## SUMMARY

This EQ is by no means a budget unit, especially when you consider that you only get one channel, but it is significantly cheaper than its more sophisticated Red-series equivalent, and it behaves like a true top-end device. Having a built-in mic amp means you can use it as a direct-to-tape voice or instrument channel, but there's no insert point between the mic amp and equaliser, so you can't patch in a pre-EQ compressor. The inclusion of an instrument

The sad thing is that a great many people don't realise how limited their existing EQ is, and until more people are exposed to EQs of Focusrite's calibre, they may never realise what they're missing.

SOS

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# Philip Rees Little MCV

## MIDI-CV Converter

**Philip Rees have added yet another useful little box to their range of MIDI problem solvers. DEREK JOHNSON gets converted.**

Interest in pre-MIDI monophonic synths just doesn't seem to be going away. An inevitable offshoot of this state of affairs is a niche market in interfaces that allow modern MIDI equipment to communicate with vintage gear. While Kenton Electronics arguably dominate the market in MIDI-CV converters in the UK, there are a handful of other companies offering alternatives, and one such is Philip

Connection is simple: plug a MIDI cable from your keyboard or sequencer into the MIDI In socket at the left, select a MIDI channel with the 16-position knob on top, and connect the control voltage and gate output sockets at the right to the relevant inputs on your monosynth. Note that the Little MCV lacks a MIDI Out or Thru socket, which means that it would always have to come at the end of a MIDI chain.

Different synths use different CV and triggering standards, so the Little MCV provides a pair of switches to make your choices. One selects between the fairly common logarithmic (volts/octave) CV standard, as used by Roland's SH101, and the linear (volts/hertz) CV response, used by some Yamaha and Korg synths (including the MS20). The other selects one of three trigger output types; most synths work with +5V, but some (my Moog Prodigy, for example) need +10V; an S-Trig negative trigger option is supplied for synths — some Moog and Korg models — which require it.

The only other controls are a pair of miniature potentiometers, accessible with a small screwdriver, labelled Tune and Trim. These need to be set before you start using your Little MCV — it's fiddly, but at least should only need to be done once. The tuning range is about four octaves; tweak this control when your synth has warmed up, so that its tuning is stable. The 'Trim' pot is discussed incoherently in the manual, but basically sets the octave 'width' of the CV output, so that it's in tune across its whole range. This isn't as fraught as the same procedure on a monosynth, since once one pair of octaves is right, the rest of the Little MCV's range is automatically in tune too.

### FACILITIES

In addition to these few controls, the Little MCV has a number of hidden features, accessible only via MIDI. As well as responding to a 128-note range and accurately tracking pitch-bend information, it has an inbuilt LFO, which responds to the attached synth's mod wheel, adding vibrato to the CV output. Pitch-bend range and LFO speed can be altered, but only via MIDI control changes. The same goes for a number of other features: legato, portamento, and a variety of sustain modes are handily available, but only if you can generate the necessary controller info, either from within a sequencer or from a smart master keyboard, to turn them on or off. Of

**pros & cons**

**PHILIP REES LITTLE MCV £76**

**pros**

- Easy to use.
- A choice of linear and logarithmic CV conversion.
- Internal PSU.

**cons**

- No extra gate or CV outputs.
- No MIDI Thru socket.
- No power switch.
- Hidden MIDI functions.

**summary**

Affordable, easy to use, and potentially sophisticated (given a modicum of MIDI elbow grease), the Little MCV fits nicely into Philip Rees' range, and even better in the analogue synth-equipped studio.

**SOUND ON SOUND**

course, a mixer map, of the kind available in Steinberg's *Cubase*, could be customised to give you control. Those with simple MIDI setups will have to improvise in some way.

The manual is a definite let-down: all the necessary MIDI information seems to be provided, but it's often confusingly expressed. Some sort of table, listing continuous controllers against the parameters they control on the Little MCV, would have been very welcome.

### VERDICT

In use, the Little MCV offers accurate, reliable CV and gate conversion, and is basically simple to operate: you could just plug and go, if you like, ignoring the extra MIDI-accessible facilities (though you still have to spend a couple of minutes with the Tune and Trim controls). It lacks some of the sophistication of the Kenton interfaces — there's no auxiliary CV output or display, no power switch, and the LFO is fairly simple, for example — but still has plenty of extras, even if they're only accessible with MIDI controllers. For the money, however, it's hard to fault. If you've just bought your first (probably inflated) monosynth, and are feeling a bit tender in the wallet area, the Little MCV is currently the cheapest way to give it MIDI capabilities. **SOS**



Rees Modern Music Technology, who are better known for their useful range of MIDI Thru, merge and switcher boxes. They now also produce a pair of MIDI-CV converters — the £189.95 MCV, and the single-channel Little MCV. The latter is particularly noteworthy, since, at a recently discounted £75.95, it is probably the cheapest MIDI-CV converter currently available in the UK.

### CONTROLS

The Little MCV comes packaged in the familiar Philip Rees red and black livery, and uses the same style of box that houses other items in the company's range — there's even an internal power supply, as with many Rees products.

**E** £75.95 inc VAT.

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# SPL Auto Dynamic Studio Processor

*PAUL WHITE makes a bid to trip up the SPL de-esser, but even the phrase 'several sad somnambulists sincerely take tea tearing tickets till sunset' does little to ruffle its electronic feathers.*

I have to admit that I've never been a strong advocate of conventional de-essers — the cure somehow always seems worse than the symptoms. A conventional de-esser is basically a compressor with an equaliser in the side chain. The equaliser is set to emphasise the offending sibilant, usually found in the 5-8kHz range, so that the compressor becomes more sensitive to these frequencies, causing it to reduce the overall signal level momentarily whenever sibilant frequencies are detected. The problem is that sibilant frequencies don't always come along neatly separated from other bits of audio that you want to leave intact, so whenever a sibilant is detected, down comes the gain of the whole signal, whatever frequencies it comprises. The subjective outcome of this approach is that once you apply more than a very modest amount of de-essing, the voice being processed seems to develop a most unnatural lisp! Why this has been tolerated for so long is a mystewee — it's a mystewee...

More sophisticated de-essers have been available for some time, and they get around the problem described above by applying gain reduction only to the problem frequency band, leaving the rest of the spectrum unprocessed. SPL take this approach, but as you'd expect from SPL, some lateral thinking has gone into the design, to make the processor easier to use, and to keep audio side-effects to a bare minimum.

Firstly, the SPL system doesn't just look

for sibilance in a wide 'general sibilance' region of the spectrum. Instead, the user sets a front-panel switch to Male or Female, in order to narrow down the search area. This centres the search in either the 6kHz or 7kHz areas respectively. In addition, the circuitry then automatically tracks sibilant frequencies in such a way that only the offending part of the spectrum is treated, effectively confining the processing to a much narrower frequency band. Instead of simply splitting the signal into different frequency bands and compressing the sibilance band, the SPL approach is to detect sibilant sounds, as above, then add these, out of phase, to the main signal, so that they cancel out. This neatly avoids the potential for phase and level errors introduced by band splitting.

Another unique feature of this de-esser is SPL's automatic threshold-adjustment system. With a conventional de-esser, once you've set the compressor threshold, the input level must be kept reasonably constant, otherwise the amount of processing will vary with the level of the singer's performance. In real life, singers move in relation to the microphone, so to ensure more stable operation, the designers have devised an auto threshold system that automatically adjusts the de-esser threshold according to how the input level changes. In theory, you could place a compressor before a conventional de-esser to even out level changes, but in practice, the most natural-sounding results are achieved by compressing after de-essing.

The outcome of all this imaginative work on the part of the designers is that the user only has to set the Male/Female switch and then adjust the S-Reduction knob to obtain up to 20dB of sibilance reduction.

## THE RACK, PLEASE

Housed in a 1U-high rack case, the SPL Auto Dynamic De-esser features one of SPL's distinctive laser-etched front panels, with a blue marbled finish. Perhaps this interesting effect makes up for the lack of controls to look at, because the control system is so beautifully

## pros & cons

### SPL AUTO DYNAMIC DE-ESSER £469

#### pros

- Incredibly straightforward to use.
- Minimal side effects.
- Very effective for reducing sibilance.

#### cons

- Expensive for most semi-pro users.

#### summary

This is the most effective, and the simplest to operate de-esser I have tried — but quality always comes at a price.

**SOUND ON SOUND**

simple that it's really quite boring.

The audio signal path is electronically balanced at a nominal +6dBu, and both TRS jack and XLR connectors are provided, as is a ground-lift switch. This is a two-channel unit where both channels operate independently; controls for each channel comprise just one knob and three buttons.

As I mentioned earlier, the de-essing process is controlled by the S-Reduction knob, and the Auto Threshold button activates the system that links the de-essing threshold to the input signal level. Disengaging Auto Threshold leaves the threshold independent of input level, but for most applications, the unit works best with Auto Threshold left on. The Male/Female switch centres the de-ess 'seek' zone at either 6kHz or 7kHz, but on occasions, you'll find the female setting works best with a specific male voice, and vice versa.

Bypassing the process is achieved using the button labelled Active; in bypass mode, the input signal is routed directly to the output, so that absolutely no noise or coloration is introduced. The same hard bypass comes in if there's either an interruption in the mains power supply, or a failure of the internal PSU. The audio signal path is exceedingly clean, with a frequency response extending from 10Hz to 100kHz (-3dB), and when processing





# De-esser

is taking place, the signal-to-noise ratio is quoted at -81dBu. In practice, this translates to 'extremely quiet': in all normal circumstances, the unwanted noise coming in via the mic or from the mic amp will exceed this figure by a considerable margin.

## BRAHMS AND LISP

Testing this unit didn't take long — after all, the learning curve regarding the controls is so flat you could skate on it! With Auto Threshold switched on, turning up the S-Reduction control to give four or five dB of 'ess reduction' is enough to make a considerable difference to the level of sibilance without unduly changing the overall character of the voice. What's more, the amount of de-essing remains reasonably constant when the microphone is moved to simulate a typical performance or recording session. Using more de-essing than strictly necessary leads to a slight dulling of the sound, but the side effects are significantly less serious than with a conventional de-esser.

Switching Auto Threshold off doesn't reduce the effectiveness of the de-esser, but the gain reduction meter does show that the amount of de-essing taking place varies significantly as the mic is moved around. This is exactly as expected.

## STUDIO ESS-ENTIAL?

For those unfamiliar with de-essers, or wondering why they might have reason to use one, these devices are designed to reduce the effect of over-stressed 'S' and 'T' vocal sibilants in a performance. While most singers don't need specific treatment, others sound like a leaking boiler

as soon as they come anywhere near a decent mic, and using a bright capacitor mic, adding compression, using top-end enhancement, or processing with a bright reverb will significantly exacerbate the situation, and increase the need for de-essing.

The Male and Female de-essing frequency settings produce slightly different subjective results, and the sound of the remaining signal when processing heavily is also changed. Again, this is not unexpected, but it does indicate that you shouldn't take the male/female settings at their face value — try both and see which works best for any individual singer.

## SUMMARY

SPL have succeeded in taking the pain out of de-essing, and although some slight timbral change is evident when heavy processing is being used, there's no sense of lispiness or gain pumping, even at the most extreme settings. Using sensible settings, all that gets left out is the sibilance.

Most de-essers produce such bad side effects that I'd rather change mic or mic position in an attempt to avoid having to de-ess, but SPL's approach is eminently usable. What's more, the controls are so simple that even the most inexperienced engineer will find it virtually impossible to get into trouble. De-essers aren't exciting, and this one isn't exactly cheap, but for the professional studio operator who has to be able to deal with all eventualities, including sibilant vocalists, it's a wonderful tool to have on hand.

SOS

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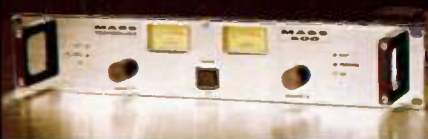
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# Audioworks Sound2MIDI

## Audio-to-MIDI Conversion Software for PC

*The first software release from AudioWorks offers hope to MIDI musicians with limited keyboard skills. Sound2MIDI lets PC users record note-perfect sequences, using only a soundcard and a microphone.*

*DOMINIC HAWKEN sings for his supper...*

Phil Collins had a dream. Three years ago, blessed with a love of the recording studio, an in-depth knowledge of computer systems, and a complete lack of keyboard skills, he decided to turn his dream into reality. Driven by a desire to record compositions without having to develop the necessary playing

skills, he recruited a programming team capable of developing a system that could record his singing voice and automatically convert the audio signals into MIDI note data.

Three years on, the first AudioWorks product has finally hit the streets. Philip Collins — at pains to distance himself from his multi-million album-selling namesake — is now a company director, and the future is looking groovy. Two major projects are currently underway — a noise removal system to rival Sonic Solutions and the other pro-based alternatives, as well as the *Sound2MIDI* system currently on offer. Both were originally intended as hardware systems, but during their extended development time, as off-the-shelf computing power increased, it soon became apparent that they could be released as software products that could run on a stand-alone PC.

### BASICS

*Sound2MIDI* is designed to work with any PC running Windows, including the latest Windows 95 update. A comprehensive setup routine automatically backs up any previously installed files, and generally takes care of most of the common problems associated with bad installation software. Once run, the program adds a new MIDI input driver that can then be selected by a Windows-based sequencer as the instrument source. It also installs the *Sound2MIDI* Control Panel, which can then be optimised to suit your current hardware configuration and operating environment.

The software interfaces directly with a sequencer or scoring package — the review copy was tested with *Cakewalk Pro Audio v4.01*. Two operational modes are provided, 'synchronous' and 'asynchronous', in an attempt to interface with as many systems as possible.

Products that support asynchronous mode (where the time-stamp of the incoming MIDI is recorded, rather than re-generated internally) generally work best, although *Sound2MIDI* automatically buffers and delays incoming signals to compensate for any timing deficiencies that might occur with synchronous products.

Sequencers currently recommended by AudioWorks include the latest

### pros & cons

#### AUDIOWORKS SOUND2MIDI £99

##### pros

- Works with any Windows-based soundcard.
- Easy to install and operate.
- Good results with even the most basic microphone.

##### cons

- Only available for the PC!

##### conclusion

Great utility for the Windows-based musician.

**SOUND ON SOUND**

versions of *Cakewalk*, *MidiSoft*, *Musicator*, *Encore* and *WinJammer*.

The software works by analysing the audio sent to the input of the PC's soundcard. The programming algorithms quickly detect the waveform of the signal, determine the current pitch and note lengths of the incoming sound, and then convert this information into MIDI

### SOUND2MIDI PARAMETERS

#### • SENSITIVITY

This control sets the threshold below which low volume signals, such as background noise, will be ignored. The higher the value, the greater the signal required to register a MIDI note.

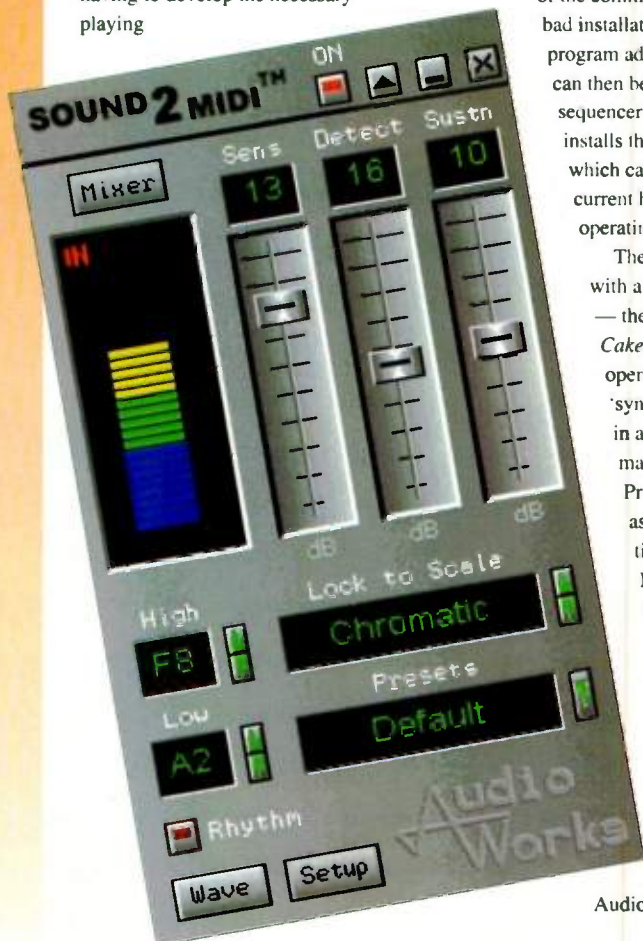
#### • DETECTION

This controls the software's ability to detect the start and end of a note. Generally, the faster the music, the lower the figure required to accurately detect all of the notes.

#### • SUSTAIN

When using a MIDI voice with a different attack and decay to that of the source sound, altering this parameter will sustain the edges of the note to make them sound more natural. The higher the value, the longer the sustain.

data. Selecting *Sound2MIDI* as the current MIDI input device allows your sequencer to record the resulting MIDI information as if it were sent from a master controller — no keyboard skills required! It is also possible to import WAV files, and process these as though they were live audio. In this way, you can load up a previously-recorded take, and automatically replay the part with a new





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# Audioworks Sound2MIDI

- ▶ MIDI-based sound as if the sequencer had performed the original.

## SETTING UP

*Sound2MIDI* installs with a basic default configuration designed to work with most PCs without alteration. The Control Panel automatically links with your current soundcard mixer utility, and to get the system up and running, all that is usually required is careful setting of the microphone input level, which is done by checking a level meter on the left of the screen. Power users can optimise the system by adjusting three main sliders that alter the sensitivity, detection threshold and sustain settings — see the parameter box for a detailed description. As well as detecting pitch and note durations, *Sound2MIDI* can also be used in 'rhythm' mode to create complex percussion tracks. Under these settings, the software ignores pitch information, but tracks volume,

## SYSTEM REQUIREMENTS

- IBM or compatible PC with 486 66MHz or greater processor.
- Windows 3.x or Windows 95.
- Windows-compatible 16-bit soundcard with MIDI capability or MIDI out port.
- PC sequencer or notation software supporting external MIDI input.
- Minimum of 8Mb of RAM.

signals very quickly, and time-stamped them accurately, so that the synchronisation between different tracks remained consistent.


## CONCLUSION

All in all, a very pleasant surprise. *Sound2MIDI* actually does detect pitch information, and converts audio into MIDI note data. Admittedly, it is only capable of working accurately with a monophonic source — a voice or wind instrument is ideal — but some interesting effects can be obtained by feeding a wide variety of audio files into the system and recording the results. The concept of using *Sound2MIDI* to single-handedly record an entire multitrack composition, though not impossible, remains a daunting one, but

dynamics and timing, and sends out the MIDI data on a single note that can be defined in the setup menu. This is great for generating programmed versions of drum loops — with any subtle timing nuances remaining intact — or for triggering a MIDI gate in time with a previously-recorded audio track.

## IN USE

The software installed without a hitch and actually worked first time. It is a very strange feeling to sing a phrase into a basic microphone (in this case connected to a Creative Labs AWE32 soundcard), and then hear the same phrase immediately played back, note-perfect, with a piano sound! After more experimentation, and careful adjustment of the sensitivity control to remove any spurious notes generated by the high level of background noise in my room (hard drives clanking and the like), it was possible to record complete multitracked performances with very little editing and correction. Admittedly, some odd notes did creep in along the way, but it has to be said that these were more likely down to my lack of singing prowess rather than any particular fault of the software! The program identified incoming audio

the software excels as a tool to record phrases and lines as they are heard by the user, without the need for any playing ability or a master keyboard. I look forward to the next release from AudioWorks with much anticipation. 

£ 99 inc VAT.

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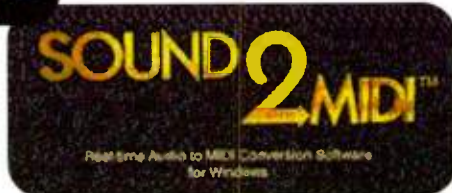
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Info



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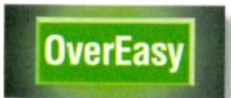
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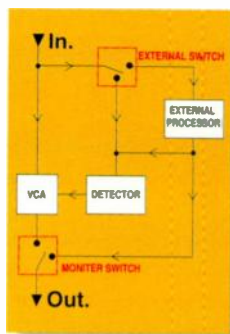


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# MOTU MTP AV

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The MTP AV can be programmed from either its front-panel LCD or from the *Console* software provided, and you can store your setups in the MTP AV's internal

memory locations. Using the *Console* software, you can call up and modify any of the preset 'Base Setups' supplied as starting points. Setups can also be stored to disk on your computer, so the *Console* application is basically an editor/librarian for the MTP AV. Once you've edited and stored your setups, you can use the MTP AV as a stand-alone, customised MIDI processor, with no need for an external computer. On the other hand, if you intend to use the unit with a MIDI sequencer, such as *Performer* or most other popular software, you don't actually need to use the *Console* software, as you can control the unit directly from within the sequencer.

### NETWORKING

For those of you with larger MIDI rigs, the MTP AV's Network serial port can be used to connect a second MTP AV to provide connections 9-16, or even to link up to a standard 16-channel MIDI interface. It can also serve as a second connection to the Macintosh, although this is not normally necessary with

most applications which can use the multi-port capabilities of the unit. This capability is provided for compatibility with software which does not support the multi-port MTP standard.

It's actually possible to connect up to four MTP devices to your Mac, using two on each serial port — modem and printer. In this case, there would be a free Mac port on each box providing connections 9-16, as the pairs of MTPs are connected using the network socket. You could use these to hook up a second Mac, which would then have equal access to the complete MIDI system. You can even connect both a Macintosh and a PC to the MTP AV at the same time, connecting the PC to the parallel port and the Mac to the network port; with this setup, the computers can even send data to each other.

### THAT SYNCING FEELING...

An ADAT Sync Out port is provided for those who would like to control ADATs; several can be chained from this. *Performer* and *Digital Performer* (as well as other popular sequencers)

offer MMC control of ADAT via the MTP AV, and you can arm your ADAT tracks from within the sequencer software, as well as controlling the ADAT via the sequencer's transport controls. It's worth noting, though, that the MTP AV doesn't extract the ADAT's own internal timing information and turn it into a MIDI Time Code output.

If you're working to picture, you can sync the MTP AV to any incoming video signal — whether a standard video signal or a blackburst video sync signal — to achieve frame-accurate sync however long your video cue is.

The MTP AV is also a SMPTE/MTC timecode converter and generator, and a pair of quarter-inch jacks is provided to connect to sources and destinations such as one track of a multitrack tape recorder, a hard disk recording system, or an automated mixing console. A front-panel jack, the Pedal B input, is provided for connection of an Alesis LRC remote controller or any device that emulates the LRC, such as the Fostex Model 8312 controller. You can even convert an audio click to MIDI, using

**pros & cons**

**MOTU MTP AV £649**

**pros**

- Simple user interface allows access to all functions from the front panel.
- Can be used as a stand-alone unit for stage work.
- Seamless operation from within most popular sequencer packages.
- Extremely versatile synchronisation features.
- Very good value for money.

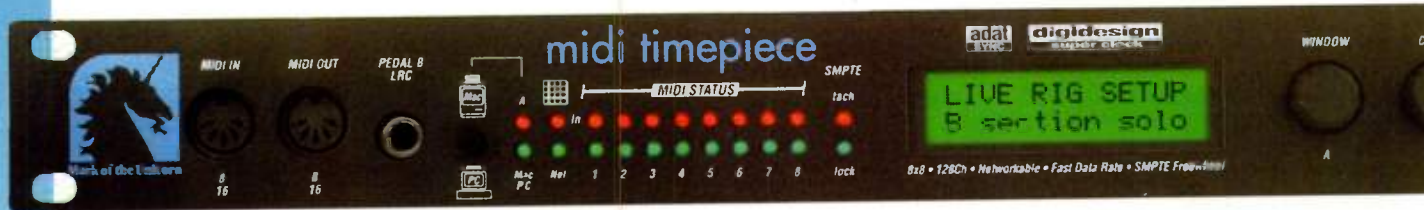
**cons**

- Ideally, it ought to have 'thru' sockets and switches to let you hook up a modem and printer without resorting to an external unit.

**summary**

This has to be one of the most versatile choices available for the professional MIDI musician or studio owner. It works with either Mac or PC, provides synchronisation for anything that moves, and offers comprehensive MIDI patching and processing facilities too.

**SOUND ON SOUND**



the Pedal A input. As their names suggest, you can also connect a foot pedal or footswitch to the Pedal A or B inputs — so, for instance, it would be possible to make a pedal act as a tempo source, or as a volume controller for various synths in your rig.

Finally, the MTP AV acts as a digital audio synchroniser for Pro Tools, Pro Tools III, Pro Tools Project and Session 8 (for both Mac and Windows) systems, operating with any software which works with the Digidesign hardware, such as *Digital Performer*, *Logic Audio*, *Cubase Audio* or *Studio Vision*.

### IN ACTION

Adding the MTP AV to my existing rig was a cinch. I connected via the Mac's printer port, as I already have an Opcode Studio 4 working with a MOTU MTP 1 hanging off the modem Port. I also use a modem to connect to the Internet, and the Studio 4 has a 'thru' socket, switchable from the front panel, which lets you keep your modem hooked up to the Studio 4 and route this through to the Mac when you need to use it. I



wanted to keep this setup in place. The MTP AV doesn't have any modem or printer 'thru' sockets like the Studio 4 — so the MTP AV manual recommends that you use an external serial switcher box to achieve the same end. To complete my first setup, I connected a Roland XP10 multiimbral synth to the MIDI In/Out 1 sockets on the MTP AV.

With everything hooked up and all the switches in the correct positions on the MTP AV, I booted up the newly-released *Performer* 5.5 and chose the 'Edit FreeMIDI Configuration' from the Basics Menu. Up came the FreeMIDI Configuration window, where I could see my existing MIDI rig connected to the modem port. I opened the Interface Settings dialogue and checked the printer port at the 1MHz speed setting, then chose the 'Update Interfaces' menu command. This put up an icon for the MTP AV connected to the printer port, and

"If you have a small project studio using an Alesis ADAT and Digidesign Pro Tools, maybe sync'ed to video or to an analogue multitrack, this has to be just about the most perfect choice of interface for your Mac or PC."



I quickly created a device in the setup for the XP10 synth, which I connected to the first pair of ins and outs. I also turned on the QuickTime musical instruments in the FreeMIDI configuration.

With this done, I switched back to *Performer*, and everything was in place for me to use — I could instantly route tracks through to the XP10 via the printer port, to the QuickTime General MIDI synthesizer, or to any of the other synths in my rig connected via the modem port. It was all extremely straightforward.

### THE VERDICT

If you have a small project studio using an Alesis ADAT and Digidesign Pro Tools, maybe sync'ed to video or to an analogue multitrack, this has to be just about the most perfect choice of interface for your Mac or PC — and it couldn't be much simpler to use. Its versatility is unmatched by any other device on the market, the price is right for what you get, and I can hardly fault this unit in any way. I reckon MOTU have a real winner on their hands.

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# Audio Technica 4041

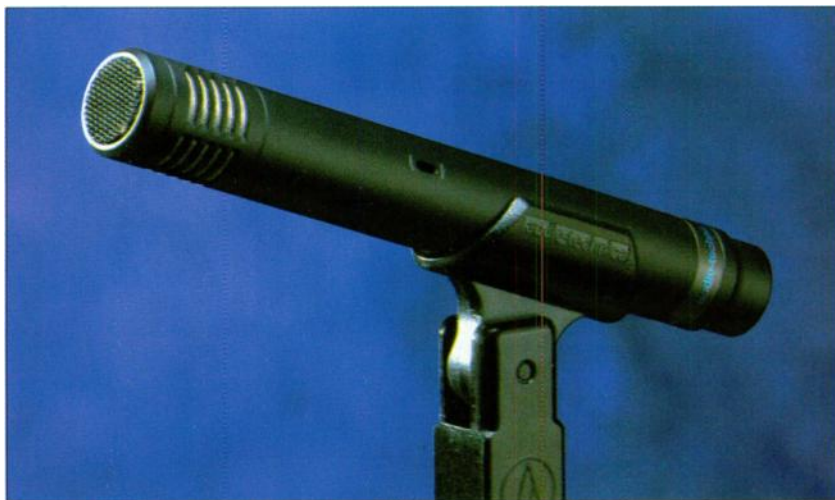
## Cardioid Capacitor Microphone

### Success on a stick?

**PAUL WHITE** studio tests a new back electret that would appear to combine strength with sensitivity.

**M**ics tend either to look large and exciting or thin and anonymous, but you should never judge a mic by the shape of its packaging. If any generalisation can be made, it is that small-diaphragm mics tend to sound more accurate than flattering, and because of their capsule geometry, they're often better at dealing with off-axis sounds than large-diaphragm models. However, having said that, there's a surprising amount of variation between mics that look very similar.

A good many mics look quite similar to the AT4041, which follows the traditional 'stick' format. Housed inside the black, turned-brass housing is an extremely sensitive back-electret capsule capable of outputting 15.8mV/Pa. Its frequency response is nominally flat from 20Hz to over 20kHz, with just a hint of an 'air' peak at around 12kHz, and its dynamic range is quoted as 121dB, the maximum sound level for 1% distortion being a hefty 145dB. If you don't have a head for numbers, this tells you that you're dealing with a reasonably honest microphone, with just a hint of top-end flattery, that can tolerate high SPLs and won't present you with a battle against noise when it's faced with quieter acoustic instruments, even if you're using a fairly modest mixer.



The 4041 runs from phantom power only (there's no provision to use batteries), and the electronically-balanced output is DC coupled, to preserve clarity under high-output conditions. A switchable 80Hz, 12dB/octave low-cut filter helps takes care of very low-frequency background noise in speech, or for other applications that don't require an extended low-frequency response, and the filter switch is recessed to prevent inadvertent activation.

There's little to say about the construction of this mic, other than that the capsule — which, apparently, is artificially aged to ensure consistent performance — is actually mounted inside the removable head of the mic rather than fixed to the body. A fine wire mesh protects the capsule, and a simple foam windshield is supplied by Audio Technica, along with the obligatory mounting clip and a sturdy plastic carrying case.

### IN USE

This is one of those mics that doesn't have much in the way of a 'sound' — instead, it delivers a faithful rendition of what you feed into it, with almost ruthless accuracy. Compared to some other mics, even quite expensive ones, the Audio Technica 4041 delivers an amazingly high output signal, and that means you can work with quiet acoustic instruments or fairly distant sound sources without noise becoming a major concern. The impression is of a very fast transient response — enhanced, no doubt by the slight top-end response rise — but the low-frequency end of the spectrum is handled equally proficiently, resulting in a well-balanced, revealing sound that literally shimmers with detail.

An accurate mic such as this can turn its

### pros & cons

#### AUDIO TECHNICA 4041 £320

##### pros

- Very sensitive.
- Detailed, accurate response.
- Tolerant of high SPLs.

##### cons

- May be too truthful for comfort in some applications.

##### summary

A useful all-rounder that's sensitive enough to tackle instruments that might cause less sensitive mics to struggle.

**SOUND ON SOUND**

hand to just about any job, even vocals, though whether you prefer the slightly more comfortable, rounded sound of a large-diaphragm mic is purely a matter of artistic choice. For acoustic guitars, drum overheads, assorted ethnic percussion or plucked instruments in general, the Audio Technica 4041 works equally well, and there's sufficient dynamic range to allow it to cope with brass or sax.

### SUMMARY

Once again, Audio Technica have come up with a sensibly-priced mic that could be used successfully in a number of recording, broadcast, or even live sound situations. Though not an obvious choice as a vocal mic, it may well suit singers who normally have difficulties with clarity — all that's needed for this application is a pop shield. Furthermore, because of its very high output, the mic is sufficiently sensitive to record choirs and small acoustic ensembles.

As an instrument mic, the 4041 can be used on virtually any source where a cardioid-response mic is required, and providing you have a suitable phantom power source, it would also make an excellent location mic for gathering sound effects and similar applications. No mic built has ever been a true jack of all trades, but his one comes pretty close. A useful addition to any mic locker.

SOS

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# dbx Project 1 Model 286

## Microphone Processor

*This new voice channel aims to provide all you need to get a good sound from a mic, at a reasonable price. DAVID MELLOR tries it out.*

Getting a great vocal sound is a skill that eludes many home recordists and even, judging by what I hear on CD, pro engineers occasionally. The first step, in an ideal world, would be to use a really good vocal mic, but since we're talking about a price tag of more than a thousand pounds, perhaps substantially more, that isn't an option for most of us. There are mics in lower price ranges that will turn in a really good vocal performance, given a bit of careful processing, but to hook up all the equipment you might need is time-consuming and inconvenient.

Several manufacturers have identified this situation, and have produced so-called 'voice channels' which incorporate a mic preamp and various processors that will enable you to tweak the sound to near perfection — given a good singer and an appropriate mic placement, of course. Products of this kind

### WHAT IT'S GOT

The kind of processes you would commonly need for vocal recording are compression, equalisation, de-essing and gating, and the dbx Model 286, part of the Project 1 range of processors, provides all of these in an appropriate way, in one unit. There is a school of thought that you should record flat with no processing and save any tinkering for the mix, but the fact is that you nearly always need to correct minor deficiencies in the sound before thinking about improving it. As long as you don't process too severely, you'll be making your life easier later on and not restricting your options in any way.

The Model 286 comes in a shallow, rackmounting case with a line-lump power supply (which, to my mind, doesn't quite convey the appearance of quality that a £350 unit should). It has a single-channel mic preamp (or line input), compressor, de-esser, equaliser and expander/gate, connected in that order.

### MIC PREAMP

It is conceivable that you might want to use the mic preamp of the Model 286 without any further processing, which you are able to do using the Process Bypass switch. The gain control runs from +10dB to +50dB, which

### pros & cons

**DBX MODEL 286 £350**

#### pros

- Easily beats the average mixing console channel.
- Good combination of features.
- Good value for money with respect to much of the competition.

#### cons

- 15V phantom power, rather than the standard 48V.
- Line lump power supply with two-pin plug!
- Looks and feels a little bit cheap at the price.

#### summary

A versatile and effective mic (and line) processor. With an internal power supply, full 48V phantom power and a more solid appearance it could compete with the best.

**SOUND ON SOUND**

all capacitor mics are specified to work over a range of voltages other than 48V and you couldn't be certain that your mic would work well with this unit without first trying it out. It's possible that some mics wouldn't give a usable result at all, while others might have a reduced dynamic range. The unit works well with my AKG C414EB, however, which shows that it need not be a problem, but you'd have to check the spec of your mic to make sure before parting with your cash. With dynamic mics, of course, you don't need the phantom power and you can switch it out.

### COMPRESSOR

On a voice processor, you don't necessarily need the full range of compression controls that you'd find on a dedicated compressor. Here we find just two — Drive and Density. The compression is of the 'over-easy' type, where the ratio increases as the signal level gets higher. The Drive control therefore controls the degree of compression. Conventional compressors have a release

control, which governs the time taken for the signal level to return to normal once it has dropped back below the compression threshold. On the Model 286, the actual release time is program dependent, and the Density control speeds it up or slows it down. With just these two controls, you can, in fact, get a very smooth compression that is exactly right for vocals, and with care your recording need never sound over-compressed. An 8-stage LED bargraph shows the amount of gain reduction occurring at any moment.

(though more expensive than the dbx unit) include the Focusrite Green Voicebox, the TL Audio 2051 Valve Voice Processor, and the LA Audio Classic Channel (all reviewed November 1996), and the Symetrix 528E Voice Processor. The dbx Model 286's price point will certainly make it very attractive if it delivers the goods. I've had a Symetrix 528E in my rack for about six months now, and it's great just to be able to plug the mic in and start work, rather than starting the session by knitting patch cords.

should take care of most situations, although there is no pad available. There is an 80Hz, 18dB/octave high-pass filter for cutting out unwanted low frequencies and reducing, to some extent, the proximity effect of directional microphones. 18dB/octave is a steeper slope than is commonly found, but I'm in favour of steep slope filters generally — or at least having the option, since subjectively they 'do more' to the sound. My only quibble about the mic preamp is that the phantom power is only 15 volts, instead of the standard 48V. By no means





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# dbx Project 1 Model 286

## DE-ESSER

This is the section that I have the most reservations about using during the actual recording of the vocal. Many singers produce over-prominent 's' sounds which need taming, but if the de-essing is overdone the singer can end up sounding as though they have a cold! And there's no way, at least with current technology, that you can 'un-de-ess'. Still, if you were working with the same vocalist frequently, it wouldn't be hard to work out the ideal setting, and that should be safe to use during recording. The de-esser section of the 286 has just a threshold control, which sets the sensitivity of the de-esser as a percentage of the average signal level, which is rather better than de-essers that set a fixed threshold. I would have liked some control over the frequency range, however. An LED indicates when the de-esser is active.

## ENHANCER

Some enhancers work by adding a controlled amount of distortion to the signal. This one doesn't and is more akin to an equaliser. The LF Detail control applies a boost at 80Hz and a cut at 250Hz simultaneously. As you are probably aware, boosting low frequencies can often make the sound quite 'muddy'. This is usually due to boosting frequencies other than those that would subjectively add bottom end to the signal. You might wonder why the 80Hz boost frequency is the same as the frequency you may have chosen to cut in the mic preamp stage. The preamp comes before the compressor, of course, and you are correcting a problem that could make the compressor do strange things to the signal. Here you have the opportunity of being just a little more creative. The HF Detail control, once again, is more than a simple EQ. Here the signal is apparently analysed intelligently, and automatically determines the amount of equalisation necessary at each moment. It's claimed to produce audio that is detailed, defined and never shrill or over-sibilant. That's a lot for one little knob to attempt, but within the limits of what you can do with 270 degrees of rotation, it's certainly effective and offers something just a little different to the norm. And you can still EQ on your console, or with an external EQ unit via the 286's insert point, if you need to.

## EXPANDER/GATE

One of my personal rules of recording is never to gate the vocal as it is going down to tape or disk. Unless you're

clever about it, you'll also gate the feed to the vocalist's headphones, and it can be disconcerting to be 'on' one moment and 'off' the next. There's also the significant risk that you will gate out some quiet sounds that you really need to capture. The Model 286's expander/gate is a different matter, since you can set a ratio of expansion from hardly any at all up to 10:1, and the threshold is variable too. This means that you can reduce the low-level clutter in the signal, such as breaths, but the vocal proper won't be affected. Don't forget that compression raises the noise floor of the signal, and you will almost certainly need to deal with this in some way. An LED indicates when the signal is below the expander's threshold.

At the end of the chain is an output level control, which will prove necessary to make up the gain that is inevitably lost in the compression process. There's not much I can say about that, except that I'm very happy that it's there (especially since output level controls are increasingly absent in signal processing equipment).

## A GOOD BUY?

As I indicated at the beginning of this review, the first priority of any studio (except if it's only intended for instrumental recording) should be to buy a really good vocal mic. However, that's going to cost you really serious money, and there's a case to be made for buying a cheaper mic (but still of professional quality, such as the AKG C3000 or Audio Technica AT4033a) and spending the money you have left over on a dbx Model 286. The result would be a wider sound palette to work with than someone who'd spent all their cash on one mic. Of course, the Model 286 has a line input too, so you're not restricted to using it exclusively for recording vocals — I use my own Symetrix 528E frequently on line-level sources, and for playing about with individual tracks at the mixing stage. You can rest assured that once the vocal is down on tape, the Model 286 won't be resting expensively idle in your rack, but will continue to earn its keep all the way through the session.

SOS

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# Scarlet

STEINBERG RED VALVE IT TDM GUITAR PREAMP PLUG-IN

Steinberg's *Red Valve It* TDM plug-in package is a software emulation of a rock guitar amplifier and loudspeaker system, designed specifically for use within Digidesign's Pro Tools TDM environment. While the amplifier and speaker may be virtual, the Digidesign hardware is very real — as is the price tag attached to it — which is a shame for many of us because, as you'll discover if you read on, the quality of amp emulation is impressive. The plug-in may be used in real time to effect signals being recorded, or it may be used to process previously-recorded parts, and the amplifier and speaker simulator sections may be deployed individually if the need arises.

Before you can use *Red Valve It*, you'll need a Mac/Pro Tools TDM system and TDM-compatible software. This could be Digidesign's own Pro Tools software or a TDM-compatible audio sequencer such as *Cubase Audio* or *Logic Audio*. Like most music software, *Red Valve It* is copy protected — not by a dongle this time, but by the equally familiar master disk install system. After installation, you have to authorise your hard drive before the software will run, and doing this uses up one of the two installation counts on the disk. Disk installs aren't affected by de-fragging the drive, and if you accidentally trash the *Red Valve It* application on your hard drive, reinstalling will get you running again without using up another install. If you must re-format your drive, you should run the uninstall routine on the master disk first to recover the install. This system works well enough, but it's still too easy to lose your installs and end up stuck in the middle of a session if, say, your hard disk crashes.

I can see why copy protection is required, but as a legit user, I don't feel comfortable knowing that I can be locked out of my own software, and if the manufacturer goes out of business (some software companies are quite small), what do you do if sometime in the future you lose your installs or corrupt your master disk? What's more, with the amount of protected software on my computer, it could take several hours to find the master disks and uninstall everything. At the very least, there should be a utility that can automatically gather all your hard disk installs onto one disk, so that you can put them back again in one hit after formatting or resurrecting a serious crash.

## RED VALVE IT

Sermon over. Once installed, *Red Valve It* comes up in the list of insert devices as two separate modules (the *Red Valve It* amp simulator and the *Virtual Speaker 1* speaker simulator), each of which requires a whole DSP chip to operate. A

# Fantastic?



basic Pro Tools III NuBus system, such as the one I'm using, has only two spare DSP chips, so if you want to use both the amp and speaker simulator, you've no room to run any other plug-ins.

You need to remember that you can't just plug a guitar into a Pro Tools I/O box, because the inputs are optimised for line level, and anyhow, the impedance is far too low for a guitar. A DI box with gain, such as the Award Matchbox, is perfect for the job, though if you have a mixer to bring up the gain, a standard DI box, hi-Z active pickup, or active lead would do the trick. The other potential problem, especially if you're working on your own, is that computer monitors and guitars don't mix. Depending on the type of pickups you have, you may have to move back 10 feet or more before the buzz dies down to an acceptable level, especially if you're using a setting with a lot of overdrive gain.

## THE INTERFACE

Call up the *Red Valve It* amp and you're greeted by a cheerful red front panel, complete with virtual anodising, on which are six rotary controls, a couple of buttons, and a slider for selecting presets. Numeric windows are located above each knob and the usual TDM buttons, including bypass, appear at the top of the screen. The Input knob is simply a level-matching control, and a clip LED warns if you run out of headroom.

A 3-band EQ offers simple bass, middle and treble, with no fancy sweeps, parametrics or presence controls. Gain is set on a scale of 0-99 for overdrive level, while the Mix control claims to balance the processed and dry sound. My first instinct was to avoid adding any dry sound, because on analogue systems, this never seems entirely satisfactory. Nevertheless, in this digital emulation, experimenting with the Mix control produced a far more natural overdrive sound with plenty of bite and warmth.

Such a simple control setup would normally result

*PAUL WHITE plugs his very real guitar into a virtual amp and gets down to playing some unimaginable music.*

**pros & cons**

**STEINBERG**  
**RED VALVE IT £499**

**pros**

- Wide range of surprisingly convincing tube amp sounds.
- Dead simple to use.

**cons**

- An expensive way to create tube amp effects
- Preset modifications can't be stored as a user patch library.

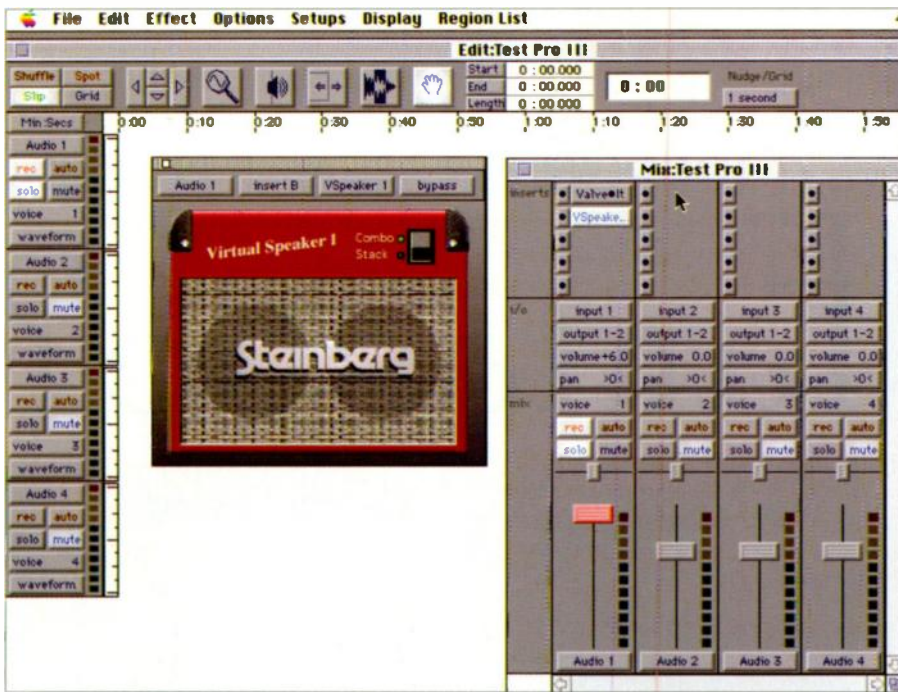
**summary**

A remarkable piece of programming, but the hardware overheads required to use it may limit its appeal.

**SOUND ON SOUND**



# STEINBERG RED VALVE IT



period, the sound also cleans up nicely when you play quietly, just like a good amp should — and exactly like most solid-state amps don't! There seems to be a hint of dynamic filtering built into some of the simulations — subtle but very effective — and if a preset doesn't do what you want on one speaker setting, you might find that it becomes a totally different beast on the other setting. As with all digital processes, there's a slight time delay between the signal going in one end and coming out the other, but in this case it's only around 5ms — the equivalent of being five feet from your guitar amp. In practice, I didn't notice it at all.

## REALITY CHECK

If *Red Valve It* came in a £100 pedal, it would be seriously impressive, but the reality of the situation is that it's not a cheap piece of software, and you need to tie up two DSPs to run it. It performs surprisingly well and doesn't sound at all digital, but I still find it somewhat perverse to tie up thousands of lines of code, two

► in a restricted set of sounds, but *Red Valve It* isn't just one preamp — it can be any one of 12 possible preset types. You choose the nearest to your needs with the Presets slider, then use the front panel controls to fine-tune the sound. (See 'Amp Preset Types' box.) Furthermore, if you pass the output of *Red Valve It* through the *Virtual Speaker 1* modules, you have a choice of Combo or Stack coloration — two very different voicings. As you move the Presets slider from left to right, the selected preset title appears in a window above the slider.

Last of all comes the noise gate, which is very easy to use, requiring only two buttons. After setting up the sound you want, simply stop playing and press the Calibrate button. After a couple of seconds, the noise gate threshold will have been correctly adjusted, and all you need do is turn the gate on, using the Gate button. Surprisingly, there's no facility for storing your modified presets, nor their gate settings, so every time you change presets, you have to reset the gain, EQ and noise gate.

## VIRTUAL SOUND

I was expecting to be seriously underwhelmed by *Red Valve It*. Digital overdrive processors have been, up to now, disappointing, but in combination with the speaker simulator module, not only can you get a huge range of tones out of the *Red Valve It*, but they're good tones as well. Though I wouldn't claim that this is a perfect tube amp emulation, it comes pretty close and has a similar feel to the Sansamp or Sessionette 75 pedals, yet the overall tonal coloration is more like what you'd expect from a Zoom product. The coloration is particularly pronounced when you bring in the Combo speaker simulator setting, though several of the rock sounds have a nice honk to them, especially if you pile on the mid range.

While the overdrive sustains nicely, bringing with it the promise of sweet harmonics during the decay

expensive DSP chips, each containing a scillion transistors, and a box full of state-of-the-art A/D and D/A converters, to do the same job as an analogue pedal containing maybe a pound's worth of ICs and a handful of resistors and capacitors.

If you want to keep your signal in the digital domain for as long as possible, or if you want to process guitar parts already recorded, *Red Valve It* is a great way to do it, and if you have a huge TDM system with DSP farm cards to spare, maybe there's a case for having it anyway, but for those of us more used to the real world than the virtual one, I feel it's an expensive luxury. What's more, it's an expensive, non-programmable luxury.

Economics aside, though, you have to take your hat off to these programmers. This is one of the best tube amp simulations I've heard, either analogue or digital, and if a version could be made to run with Steinberg's *Wavelab*, it might open up the technology to more people. The system isn't perfect — for example, I feel that a slider to move between Combo and Stack settings would have produced far greater tonal flexibility than the two very different options provided — but with a little work, you can get most of the classic rock guitar sounds out of this unit without struggling. *Red Valve It* is an easy-to-use, great-sounding product, but the cost of the hardware needed to use it will place it out of reach of those people who could best benefit from it.

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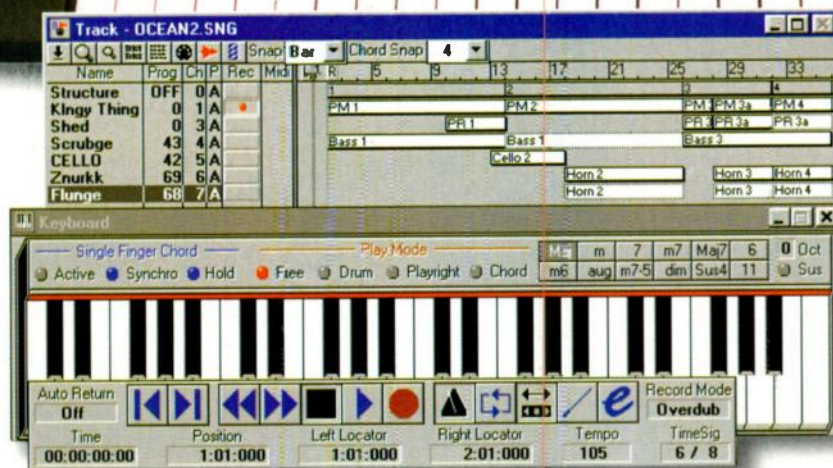
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**PAUL WHITE** explores the budget side of sequencing with Evolution's inexpensive keyboard and PC sequencing software bundle.

**M**usic Creator Pro is a 'get started in sequencing' bundle comprising a 4-octave, 49-key MIDI master keyboard and Evolution's own 'MIDI + Audio' sequencing software for the PC. Unlike some of the very cheap controller keyboards designed for computer users, this one has full-sized keys with a reasonable sprung action, wheels for both modulation and pitch bend, and a number of buttons for changing keyboard response, sending MIDI patch changes, transposing, and so forth.

## KEY FACTS

Physically, the keyboard is a little lightweight and plasticky, with power supplied by an external PSU or from batteries. Though batteries are an expensive way to work, this method of powering could come in handy when you take your laptop on a camping trip and want to work on your latest epic in the evenings. By way of connections, there's only a rear-panel socket for a hold footswitch, a single MIDI Out on a conventional

5-pin DIN, and the PSU input socket.

At the centre of the keyboard's front panel is a 3-digit LED display window, used to display patch and editing data. Nine numeric buttons and plus/minus cursor keys are accompanied by six additional dual-function buttons, the power switch, and a slide volume control which transmits MIDI controller 7 (volume) information on whatever channel is currently selected. Using the dual-function buttons in their primary mode, it's possible to change the control wheel assignment, MIDI channel, and the Program, Memory, Transpose and Octave settings. In addition to being able to send program change numbers, it's also possible to specify your own choice of MSB (Most Significant Byte) and LSB (Least Significant Byte) values, for sending MIDI bank change messages, and the first five numeric keys can be used in combination with the Memory button to store your favourite 'patch number + bank' combinations for instant recall.

Holding down specific pairs of keys activates the second function of the dual-function buttons: on the performance side, the keyboard features 10 selectable velocity curves (based on linear, exponential, reverse exponential, S-shaped and fixed curves). The same 'two at a time' procedure is used to access the bank LSB and MSB data and to provide GM reset (resets a General MIDI-compatible synth or sound module to GM defaults) and controller reset. There are no keyboard split or aftertouch facilities, but considering the level at which this keyboard is aimed, that's not too much of a surprise.

The keyboard feels much as you'd expect a budget synth keyboard to feel — functional, but unexceptional. Both wheels work smoothly enough, and the ability to modify the velocity response curve is particularly useful, but I did catch the keyboard misbehaving on one or two occasions, when a quietly-played 'A' note



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# Evolution Music Creator Pro

- ▶ spontaneously retriggered at a higher velocity level or triggered again when released. This is almost certainly a one-off fault, but if you're considering buying one, you should check anyway.

**pros & cons**

**EVOLUTION MUSIC CREATOR PRO £120**

**pros**

- Inexpensive.
- Relatively uncomplicated.
- Built-in auto-accompaniment.

**cons**

- Some non-standard control operations.
- Non-reversible quantise.

**summary**

An affordable 'keyboard + software' bundle for the PC. Most users will probably outgrow the sequencer before they become dissatisfied with the keyboard.

**SOUND ON SOUND**

"As it stands, the package enables the entry-level user to start making music very quickly."

## EVOLUTION AUDIO

Bundled with the keyboard is the *Evolution Audio* sequencer. At first glance, this appears to offer a slightly-simplified version of the *Cubase* user interface. Though there's no way to record audio from within the sequencer, you can bring in WAV files and play them as part of a sequence. For such an inexpensive sequencer, this has quite a few sophisticated features, but there's no facility for sync'ing to MIDI Clock or MTC — at least, none that I could find. Icons down the left-hand side of the page take you to the various edit windows, and these include the familiar MIDI event list, a piano roll-style editor, a notepad, a very welcome General MIDI mixer map, complete with reverb, chorus, pan and level controls, a virtual keyboard that lights up as you play the real keyboard, a single-stave score, and a tempo track. In the tempo track, tempo changes can be 'drawn in' as steps on a tempo line, but there's no way to create perfectly smooth tempo changes.

To make life easier for the less musically accomplished, there's also a chord track, into which you can place up to 12 variations on any chord, from major to augmented. This drives an auto-accompaniment section comprising a choice of 16 cheesy but cheerful styles, ranging from rock to reggae. A few stunningly bad demo tunes are provided to give an idea of what the program can do.

The familiar sequencing functions are all there, right down to the *Cubase*-style tool palette, but frustratingly, a lot of the standard key commands adopted by other sequencer manufacturers are not employed here, so to delete a track, you have to press Shift and Delete rather than simply hitting backspace. Similarly, duplicating tracks doesn't follow the familiar Alt-drag protocol. Another annoyance is that you can't play the sound assigned to a track until you've placed the track in Record Ready mode, and though the program contains a menu that lets you access GM sounds by name, the name doesn't actually come up on the main arrange page — you only see the patch number.

A number of quantise options are available, including triplet and swing variations, but some of these seemed to operate unpredictably. Furthermore, quantise doesn't seem to be undoable, which can be very frustrating.

## IMPRESSIONS

Bearing in mind that this is an entry-level package, and that the sequencer is virtually thrown in for free, the Evolution Music Creator Pro actually constitutes quite a good deal. Aside from the

## PACKAGE DEAL

Evolution also produce an even cheaper keyboard and software package, the Music Creator, which sells for around £50-60. This combination is comprised of the basic MK10 MIDI controller keyboard, with 49 mini keys, and the "fun to use" Key West beginner's sequencer. The package is aimed more at the music hobbyist or absolute beginner than the more serious musician, and apparently sells well in the high street.

intermittent keyboard fault mentioned earlier, the keyboard works just fine and feels no worse than most low-cost synths.

Though the sequencer provides its fair share of frustrations, it is possible to do some fairly serious work on it once you've come to terms with its little foibles and keyboard shortcuts. Most of the tools you need for basic music sequencing are here somewhere, even down to percentage quantise, and aside from the lack of a sync facility, the only major flaw is the permanency of the quantise operation (no Undo option). Realistically, a first-time user will probably grow out of this sequencer pretty quickly, but the time invested in learning it won't be wasted, as most of the operating methodology draws close parallels with *Cubase* and *Logic*. Trading up to a more sophisticated sequencer should be more like getting out of a well-used Lada and into a Golf GTI than moving from a car to a space shuttle. It's also worth pointing out that the software installed with no problem, it recognised all my MIDI drivers, and it didn't crash — no mean achievement on a PC! What's more, the whole manual is only 48 pages long, and covers most functions in adequate depth, and the use of icons on the main arrange page makes it easy to jump from one edit page to another.

With just a little more work on the user interface, Evolution could turn what is a 'good for the money' sequencer into something really solid — but even as it stands, the package still enables the entry-level user who already has a PC and a soundcard to start making music very cheaply and quickly. Far from perfect, but fair value nonetheless.

SOS

**£** Music Creator Pro £119.99;  
Music Creator £59.99. Prices inc VAT.

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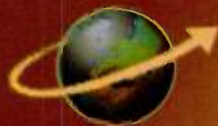


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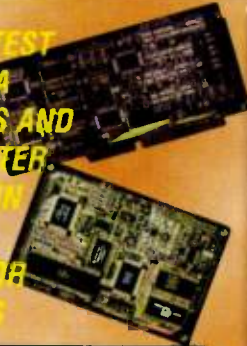
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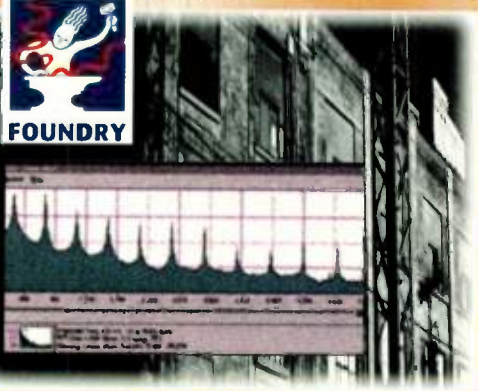
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(Southampton)

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*Eat Static: (left) Joie Hinton, (right) Merv Pepler.*

# Eat to the Beat

**When Eat Static's last album entered the UK charts at number 11, the techno duo threatened to overshadow the achievements of their previous group, Ozric Tentacles. On the eve of their follow-up, JONATHAN MILLER teleports to darkest Somerset to face conspiracy theories relating 'recovered' alien spacecraft to developments in music technology...**

## EAT STATIC

**I**n the relatively brief period since the release of Eat Static's acclaimed debut album *Abduction* in mid-1993, a host of accolades have been showered upon this unassuming Somerset duo. 1993 ended on a high, with the debut 'Lost In Time' EP achieving 'Single Of The Week' status in *Melody Maker*, and the group being nominated 'Best Dance Act' in the *NME* Readers' Poll. The band topped this in 1994 when their second album *Implant* entered the UK national album charts at number 11, and in 1995 they headlined at the Glastonbury and Phoenix festivals. 1996's 'Bony Incus' release was an instant club favourite, full of pulsating techno beats, and provided a taster of what is to come with the release of the group's third album.

If the names of Eat Static's members Joie Hinton and Merv Pepler already seem familiar, it's because the duo originally started as an offshoot of spaced-out prog rockers Ozric Tentacles (see feature in *SOS* August 1996), only departing that band to concentrate on Eat Static full-time in 1994. Unlike many group splits, Eat Static's disembarkation from the Ozrics' 'mothership' was an amicable one. The two groups have often shared concert billings, and the title track from 'Lost In Time' was engineered by Ozric Tentacles' principal spokesperson, keyboard-playing guitarist, producer and composer Ed

Wynne, and was recorded at the Ozrics' striking Somerset studio, The Mill.

### EAT STATIC: THE FIRST COURSE

My destination this time as I ventured back into darkest Somerset was not The Mill, but the attic-based recording studio at Merv Pepler's farmhouse cottage, a picturesque building in idyllic surroundings most conducive to composing and recording music. I began our talk by asking what, if anything, Merv and Joie had felt was missing in their respective roles as drummer and keyboard player in Ozric Tentacles which had prompted them to form Eat Static in 1990.

Merv: "Before I joined the Ozrics, I already had another band on the go called Wooden Baby — kind of a guitary-punky-goth band, but with drum machines. We mixed in a bit of keyboards — a Juno, DX7 and a couple of other things. Then I joined the Ozrics, and Joie started playing in this other band as well. It was more of a traditional band thing with guitars and vocals, but it eventually started leaning towards a slightly more dancey feel.

"We met up with a guy called Steve Everett who started coming to jam at Ozrics gigs with a few more keyboards, so there were two keyboard setups onstage. This was before Ed [Wynne] used keyboards live, and was still concentrating on guitar. Steve had a sampler and computer setup that he made music on at home, so we invited him over with his gear to do some music together.

"Originally, we planned to do some Wooden



Baby-type of stuff, more of a 'bandy' sort of thing, but we ended up in this room together with all the gear, and Steve just started firing in TR808 and Kraftwerk-style samples. We ended up doing a straight four-on-the-floor dance track, totally accidentally, and we had a really good time doing it.

"There we were in Ozrics doing all this technically impressive, weird music with mad timings, and getting really involved with it, and this experiment that became Eat Static was a good excuse to ignore all that, get the synths out, and be as stupid as we could!"

"We deliberately kept the first three years of Static separate from Ozrics. There was no live techno/club scene going on then. You couldn't just go out and do a techno tour, because no-one was doing it. All the gigs I was booking were club gigs and big raves. Most of the time I was arguing, trying to get us longer than 20 minutes, saying, 'Look, we don't use DATs and stuff. We want to do an hour-long live set.' And they used to say, 'If any of the bands we normally have on do longer than 20 minutes, they get booted off!'"

"It was quite interesting for us when the house/techno stuff branched out properly around '92 and '93. The whole rave scene was getting pretty violent, and there were some nasty people putting events on. It was good the way that whole crossover live/techno thing started coming in around then — it meant it was easy to go out and do a gig, as we already had a strong live following."

Joie: "We'd been doing gigs as Eat Static for about two-and-a-half years before we'd even released a white label." Joie continued the story, explaining that the duo's eventual decision to leave Ozric Tentacles was mainly due to time pressures as Eat Static took off as a successful group in their own right: "For about three years, we'd been doing Eat Static and Ozric Tentacles at the same time, and it was quite possible to do both. But there came a time when Eat Static started to get more and more bookings. Longer tours were set up, and it came to the point where Merv and I were simply exhausted. We'd return from an Eat Static tour and two days later we'd have to go off on an Ozrics tour! It just became too much to do the two. We opted for Eat Static as it was a newer, fresher thing to do. Another factor was that the Ozrics could carry on without us, but obviously Eat Static couldn't."

### UFORIC UNDULANCE

UFOlogy references are prevalent in many Eat Static track titles, such as 'Gulf Breeze' (a well-documented recurring wave of UFO activity that took place in Gulf Breeze, Florida, USA, from the late 1980s into the '90s) and 'Area 51' (an 'Above Top Secret' installation within the environs of the remote Nellis Air Force Range and Nuclear Test Site in Nevada where 'recovered' alien technology is reputedly stored). For Merv and Joie — who both claim to have seen a UFO — the oft-scorned subject of UFOlogy is not just some dreamed-up fantasy resulting from over-exposure to currently in-vogue television shows like *The X-Files*. I wondered if this theme would continue in the duo's forthcoming third album, untitled at the time of writing. Merv: "It will be, but I don't want to be so obvious with imagery this time, as many other

people are now using it as well. I suppose we can still get away with it because it's been with us from the beginning." Get away with it they can. However, Eat Static are not incapable of joking at their own expense. When I asked them, not, I confess, with my tongue entirely out of my cheek, whether they felt that their music might have benefited from the incorporation of 'recovered' alien technologies, Joie's response was appropriately non-straightfaced: "We've often wondered about our Waldorf, as it's prone to doing some very strange things. Maybe Wolfgang Palm [*founder of PPG and Waldorf — Ed*] is an alien!"

### LOONY TUNES

Ah... the colossal Waldorf Wave — Germany's 'ubersynth', about which Ozric Tentacles' Ed Wynne lamented, "I don't know if it took off particularly well, because it just seemed like a synthesizer for loonies to me!". Earlier this year, it was reported in the States that the Waldorf Wave was Eat Static's main digital keyboard — a role it continues to play, as Merv confirmed: "Originally, Joie and Ed bunged a load of Wave sounds on DAT which got sampled up and used on the Ozrics' *Jurassic Shift* album, I think. I thought there were a couple of things which would have obviously been better on Static tracks.

"Basically, our *Implant* album sold pretty well because of *Abduction* — it sold as many copies straight away, so we had a fairly decent royalty cheque, and we went out and bought a new desk and the Waldorf. Probably the best thing about also being in the Ozrics was that we had enough money coming in to live on, and so could afford to put all the Static money back into the band. Buying the Waldorf at the time felt right, and it's become the heart of our sound, really."

"The Waldorf's presets seemed really drab, so much so that I thought, 'My God, what have we done?' when we first got it. There appeared to be 127 organ sounds and just a few weird ones, but you've got to give every keyboard its own character within a band. We've always been ones for programming our own sounds. I don't even consider a synth part of the band until it's at least half full of our own sounds! That's a problem nowadays, because there's a lot of new modules specifically full of techno sounds, and I think it should be down to the individual user to go beyond what is in there."

For those of you wishing to hear the mighty Waldorf Wave in action, Joie explained: "The kind of ripping, crackly sound at the beginning of the track 'Implant' is the Waldorf, and we've used it liberally since."

Joie is also the proud owner of a PPG Wave 2.3 (the Waldorf Wave's predecessor — see the *RetroZone* in *SOS* December 1996), and is therefore well qualified to sing the Waldorf's praises, or otherwise: "The new one's definitely less buzzy! The old PPG is astonishing really, and has a totally distinctive kind of sound to it. It tends

### CELESTINE PROPHECIES

Like Ozric Tentacles' Ed Wynne, Merv is "really impressed with the Korg Prophecy. The first thing we did was to get a MIDI mixer together for it in *Cubase* on the PC, so I don't have to bother editing sounds on that stupid little screen now.

The Prophecy's controllers are so comprehensive that I had to create a huge 8-page mixer-map just to access everything! Now I can easily do stuff which would take months to program on the keyboard alone: I've brought in effects at certain points, and even swapped oscillators midway through tracks, which I could never have done before.

"It also works very well with the breath controller. When I hooked Steve Jolliffe [ex-Tangerine Dream] up to it playing his MIDI flute, he was totally shocked."





# Eat Static

▶ to sort of veer towards clangorous, metallic sounds and is quite hard to control, whereas the new Waldorf has a far richer sound texture to it, because there's more in it. There's more controllers to go for, but you can tell there's similarities between the two."

It transpired that Joie's PPG is actually a Wave 2.2 casing with 2.3 innards: "I'd heard them on some records and it looked like a wacky synth to go for, so I phoned up the Synthesizer Service Centre, and asked if they could get me one. They had four or five of them lying around in bits, and mine is a composite of those."

"I was after a digital-sounding machine, but with analogue control. In fact, it's almost like a predecessor to the Roland JD800, but without the effects, although it's not so sample-based. I was surprised at how raw it was, and the actual guts in terms of waveforms seemed very, very basic, but it's surprised us a lot of times. We used it quite a lot on *Implant*, but lately, it's been acting up a bit, so we tend to sample it now."

## METHODS OF DANCE

Eat Static are perhaps inescapably labelled as a techno group. Aside from touring with the likes of System 7 and Underworld, Merv and Joie *do* actively feel part of the so-called dance movement and regularly listen to other dance-oriented artists, simply because, according to Merv, "that's where most of the interesting stuff is coming from these days".

Despite the criticism levelled at some of the 'dance-specific' synth modules coming on to the market (with some comments appearing in this magazine — see 'Sounding Off' in *SOS* August '96 and Graham Massey's comments in the July '96 *SOS* 808 State interview), Eat Static retain an open mind on the creative possibilities of devices such as the Roland MC303 Groovebox and Emu Orbit. Merv: "People just getting going have got to start somewhere — at the end of the day, not everyone knows what to buy. The first synth I bought, for example, was a Yamaha YS200, which you may laugh at, but what we got out of it was incredible. Sure, someone may go out and buy those modules and make a load of pre-programmed-sounding techno, but you've got to think that some of these people will advance, and maybe realise in two or three years time that there are more interesting keyboards out there. I think a lot of interesting music will be coming from people who started with those kind of modules in their bedroom, but it doesn't mean they're going to stay there. Obviously, there will be people who are lazy, and won't ever bother editing, but it won't be all of them. There'll always be a certain percentage who'll want to go on and develop."

"I think the fact that people can go out and do that music really cheaply now is a good thing — the fact that you can go out and get a setup for under a grand. You couldn't do that when we started out."



We have the technology — the Waldorf Wave, Sequential Prophet 600 and PPG Wave.



More unearthly gear, including Roland JV80, TR808, TR909 and CR78, plus the Korg Prophecy.

## EAT STATIC'S EQUIPMENT LIST

### SYNTHESIZERS:

- ARP Axse
- Casio CZ1000
- Korg Poly Six
- Korg Prophecy
- PPG Wave 2.3
- Quasimidi Quasar
- Roland SH5
- Roland TB303
- Roland SH101
- Roland JD800
- Roland JV80
- Sequential Prophet 600
- Waldorf Wave

### SAMPLING:

- Akai 3200XL (32Mb RAM & 540Mb internal hard disk)
- Akai 3200 (32Mb RAM & 540Mb internal hard disk)
- Roland S330
- Roland W30

### PERCUSSION:

- Alesis HR16
- Alesis SR16

### Emu Procuision

- Roland CR78 CompuRhythm
- Roland TR808
- Roland TR909
- Roland TR707
- Yamaha Resonator drum kit

### COMPUTERS/SEQUENCING:

- 75MHz Pentium PC (16Mb RAM & two internal hard disks) running Steinberg Cubase Audio
- Atari 1040ST (2Mb RAM) running Steinberg Cubase

### RECORDING:

- Mackle 32:8:2 desk & 24-channel expander
- Tascam DA38 8-track
- Tascam DA30 MKII DAT

### PROCESSING:

- BBE362 Sonic Maximiser
- Boss SE70
- Frankenstein stereo enhancer

### Joe Meek compressor

- LA Audio compressor
- LA Audio noise gates
- Lexicon Vortex
- Lexicon Alex reverb
- Roland DEP3
- Roland SDE330 dimensional delay
- Roland SRV330 dimensional reverb
- Symetrix 511A noise reduction
- Yamaha EMP700

### MONITORING:

- Alesis Monitor Two (main)
- Yamaha NS10 (nearfield)

### AMPLIFICATION:

- Alesis Matica 500 power amplifier

### MICROPHONES:

- AKG C3000
- Shure SM57 microphone
- Tandy PZM microphone (x2)



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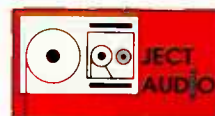


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# Eat Static

## ▶ OVERFLOWING ANALOGUE BUBBLE BATH

In addition to the aforementioned PPG and Waldorf Waves, a quick glance around the Eat Static studio revealed a wide selection of additional synthesizer sound sources, including an ARP Axxe, Casio CZ1000, Korg Prophecy and Poly Six, Quasimidi Quasar, Sequential Prophet 600, and Roland JV80, JD800, SH101, and TB303. Of all this gear, Merv claims, "The nature of these synths is that you can pretty much do anything you want on any of them. You can get a good bass sound out of any of them; you can get a good pad sound out of most of them. I think it's down to the programming. I like hearing what a synth can do — I've met people who've spotted the Quasar in our rack and said, 'I bought one of those and sold it after a week. I thought it was awful.' But I've got some amazing sounds out of it."

Joie picked up the 'we'll use anything' theme: "We don't even favour analogue over digital, really. We use whatever is right for the part. The JV80 has some incredible sounds, and sometimes we'll just use that, for example". In this, Eat Static would seem to differ from head Ozric Ed Wynne, a devoted analogue fan, who has claimed of his SCI Pro Ones, "I don't think I could make a track without them." However, it turns out that Joie's Roland SH5, which he bought new way back in 1977, is the Eat Static equivalent of Ed's Pro Ones, as Merv explains: "We always turn to that — even if we don't use it in a track CV'd or sampled, it would be acting as an audio processor using its audio input. The band-pass filter on it is like a mad filter and EQ going at the same time. We use it for gating a lot, rather like a noise gate shutting on and off with a rounded filter effect thrown in. I'm dreading the day it packs up for good; trying to find another one is going to cost us at least two grand by today's prices, I'd say — assuming we can find one."

This brings us neatly on to the inevitable price hike of all things analogue, an unfortunate side effect of the so-called analogue revival. Merv: "It saddens me, because it makes it harder for the people who should be using this stuff to get hold of it". Joie countered: "It reflects just how good they are — so it is only to be expected."

After consideration, Merv agreed, "In some ways, it will bring good things, like that new Minimoog, for instance. The fact that they've thought, 'Right, everyone's trying to buy a Minimoog, why don't we re-release it?' Also the fact that you're soon going to be able to get a new Moog modular system for three grand, instead of 15, or whatever — if other manufacturers start doing that, then it's going to be great."

## SAMPLEMANIA

No techno band would be complete without its healthy share of samples, and Eat Static are no exception to this, the number one unwritten rule of dance. The rack containing the Quasimidi Quasar synth module is well stocked in the sample hardware department, containing an Akai S3200



"So this is what you Earthlings call a Mackie 32:8:2..."

and recently-acquired S3200XL, both expanded to 32Mb with internal 540Mb hard disks, in addition to Joie and Merv's respective Roland W30 and S330, dating from their days with the Ozrics.

Merv: "The S3200XL was really bought for mixing the new album. We've always been limited with only having 10 outputs on the one Akai; it's not usually enough for our stuff, because we do heavily-layered pieces of music. Not only that, it's been invaluable live. Now, I can be loading in one track whilst playing another, and in the studio I've got 20 outs! Also they've really sorted the effects out in these XLs. The effects board is really wild — I'm well impressed with it."

"I find that although a lot of our sounds may start on a synth, I just find the sampler a really good scratch pad for getting ideas together. For example, I'll get Joie to come over one night and I'll record two DATs full of SH5, then I'll go through it, using *ReCycle* and cutting it all up using the samplers. It's usually a really good way of starting tracks, and often gives me a lot of percussive as well as musical results."

The duo are fond of using sampled loops, but in their own way. Merv: "We've used them, obviously, but since I got Steinberg's *ReCycle*, I've never used a straight loop. I used to sit there for hours chopping them up manually, but the *ReCycle* program has been really useful on the new album."

As Merv explains briefly, he connects his PC to his Akai samplers via SCSI, and ports samples across into the main *ReCycle* window, processing them there and then sending them back to the Akai with all their different components mapped out. If you like a loop, for example, but hate the snare drum in it, *ReCycle* allows you to remove the snare and replace it with any other sound you want — an admittedly invaluable tool in dance music

## LIVE STATIC

It would be fair to say that Eat Static's music is quite dense; there are many parts going on in the mix. Whilst technology has enabled them to achieve this in the comfort of the studio with relative ease, how do they set about performing their music in a live situation?

Merv: "Basically, all our gear goes out live, apart from stuff like some of Joie's old keyboards. There's two setups on stage; one big MIDI sequencer-based rig, and Joie's, which is completely independent from that, as he does everything live on top, playing manually. On his side he's got the JD800, the Prophet 600, the SH5, and the W30. On my side, it's the desks, the effects rack, and the sample racks, and then there are two A-frames, with the Waldorf, all the drum machines, the TB303, the Prophecy, and the JV80. It's pretty severe, but the racks are all hard-wired now, so we've got our setting-up time down to 40 minutes!

"I've got two Yamaha MDF data filers on which are stored some completely-arranged tracks. I've got two or three different arrangements of some of them — some longer, some shorter; depending on the mood of the night. Other stored stuff is more sequencer- and loop-based. I can send the MIDI Clock out, and run the old Sync24 Roland stuff with it. I've had the TR808 retrofitted now, so I can send MIDI Clock commands from the data filers and the whole '808/'909/TB303 setup all rolls into the sequence. That's more like a jam setup, so half of the set's arranged and half's not. That's how we've been doing it for the last couple of years."



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The **TS1** has a built-in mains power supply.

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High resolution sixteen-bit conversion allows accurate pitch across the full 128 note MIDI range with smooth modulation, pitchbend and portamento. The CV output also has a wide bipolar voltage swing and a tuning preset is provided.

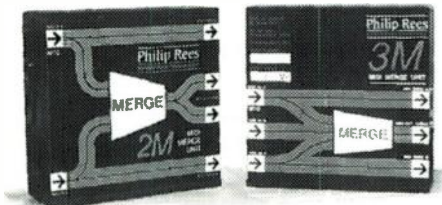
The MIDI sustain commands are comprehensively implemented. MIDI reception can be set to any channel, using the straightforward front panel rotary control.

There are MIDI IN, CV OUT and GATE OUT sockets. The mains power supply is built-in.

**Little MCV MIDI to CV Converter**.. £75.95

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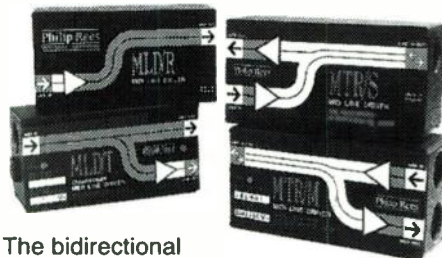


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## MIDI line driver choice

Our line drivers overcome the 15m limit of standard MIDI hardware, by converting the signal to a differential (balanced) format.

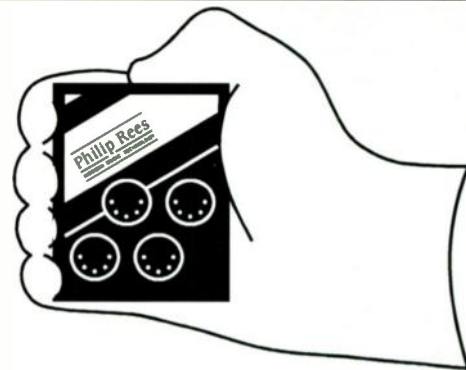
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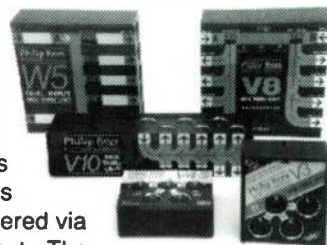
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# Eat Static

► production, or any music for that matter. Merv: "It's an incredible program, but we've mostly been using it with other stuff. I've hardly used it with beat loops; more with mad vocals or with Joie's strange samples.

"I've also got a couple of samplers in the PC — wave samplers, like *CoolEdit* and *GoldWave*, which can be really good for those lower-bit, raw-sounding samples. I love chucking in the low-bit stuff against well-recorded sounds. The grainy old Roland W30, which is 12-bit, but has a 16-bit output stage, still gets the odd look in too. In fact, we still use it on pretty much every track, as well as live. The nature of Joie's sampling is really strange; I've never heard anyone come out with samples like him! He just sits in a corner with a video player going through an effects box and the SH5, not even monitoring what he's listening to!"

## FUNKY DRUMMER

Besides The Mill and Youth's Butterfly Studios, a number of recording studios have been listed on Eat Static liner notes over the years, including Shakti and Heliosphere. Since Eat Static are only using in-line, electronic instrumentation, I correctly assumed these latter studios to be of a home-based nature, like the setup surrounding us during the interview.

Merv: "Heliosphere was my old place, which was more of a bedroom setup, and Shakti was Steve's [Everett] first house when he moved to Somerset."

Having visited the former water mill that constitutes The Mill when interviewing Ed Wynne, I asked if Eat Static had plans to follow suit by building their own high-quality recording studio outside the confines of Merv's living accommodation. Merv verified that this is indeed the case: he plans to convert an adjacent outbuilding into a studio over the course of this winter. Merv used to work as a draftsman, so has a clear idea of what he is looking for.

"We've got a double room in the outbuilding, so we're going to have a live room in there as well, which we're probably going to keep as stone. The plan is to get my drum kit set up in there, possibly with a load of MIDI triggers. I'd like to get into playing some live stuff again, recording it onto hard disk, or whatever. I haven't actually played drums since leaving the Ozrics, and I do miss it. It's one hell of an energy release, playing drums, but I think I'd still go for an in-line sound as an end result. I don't think I'd ever want us to sound like a live band trying to be a techno crossover, because I do love that pure techno, kind of synthetic vibe on it all.

"I'd like to move all this stuff into the main control room and get it wired up properly. I know what our sound should be like, and we *can* get there. We need all the general stuff which you don't tend to have in bedroom studios, like proper patchbay systems, so it's easy to try out different routings. The thing I find most annoying about bedroom studios is all the grovelling around on the floor amongst the equipment, desperately trying to

find the right hole! All that's going to change with the new studio."

Noting the conspicuous lack of any multitrack recording facilities, I picked up on Merv's reference to hard disk recording in the new studio: "I'm probably going to get the PC-based *Soundscape* system, as it seems to be the most useful one to me. It'll just be another tool, really; another way of programming stuff. I find it a bit tedious, using a mouse the whole time when working on a drum part that I could have played in there in 10 seconds — especially certain fills!"

## OVER AND OUT

Being the forward-thinking duo that they are, I asked Eat Static what developments they would like to see in, or suggest for, the exciting world of music technology in the near and not-so-near future. Joie: "I'd like a sort of analogue-controlled sampler, a sampler with a keyboard and loads of knobs all over it, obviously, with pulse width and everything built-in. Samplers have become a bit more friendly, control-wise, but they could be so much more extreme. You're supposed to be able to load samples into the Waldorf Wave..."

Merv interrupted, "That was another reason we bought it; because we heard you could dump samples into it as part of its wave sequencing and stuff — so I'd like to see the Waldorf finished properly! Half of the option buttons on it don't even work yet. None of the sequencer stuff works, and it's a bit gutting when you've spent that amount of money. I know they probably haven't sold that many, but they should still honour those people who've supported them. It will be a classic one day; there's nothing else like it. I just wish they would bring out a few more bits for it — so send me the rest of the software, Wolfgang!"

As for Eat Static's future musical plans, Merv says, "A new single called 'Hybrid' will be out in January, and it's basically going to be six tracks, split onto two 12-inches, with four different remixes — and we're going to put them out at a low price as well."

Given that Merv is sitting on DAT recordings of virtually every Eat Static gig they've ever done, I wondered if there was any chance of an Eat Static live album. Merv: "We keep getting hassled to do it. Although I've always wanted to do it properly; select two or three gigs and get a 16- or 24-track in and multitrack it all up. I was actually quite surprised at the quality of DAT recordings from our last tour. There probably is enough sitting on there to get something really good out of it."

Other associated releases in the pipeline include a collaboration between Merv and ex-Tangerine Dreamer Steve Jolliffe, also living in the Glastonbury vicinity, whilst Joie takes time off to celebrate the arrival of his first-born. In 1993, the *NME* described the band as having "the sort of workload that would drive your average indie band into early mental retirement". Given their future schedule, this evidently remains true for Eat Static.

SOS



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# Silent Running

## REDUCING AMBIENT NOISE IN COMPUTER-BASED STUDIOS

*You probably don't realise how noisy your computer studio is until you turn everything off and enjoy the silence.*

**PAUL D LEHRMAN** explains how you can arrange your setup to reduce noise and restore peace to your working environment.

Computers have fans, hard disk drives, removable, and various other peripherals that produce noise, both constant and irregular. For the majority of computer users, such as business people, scientists, or even graphic designers, this noise is relatively innocuous, a minor annoyance that is far outweighed by the convenience of having the on/off switch, the reset button, and access to floppy drives, CD-ROMs, and other media close at hand. But for musicians, this is not the case. For a musician, having a high ambient sound level in a music studio is like an artist working in a room where the walls are painted fluorescent paisley. No matter whether you're recording tracks, editing sounds, or mixing, a high noise level is sooner or later going to interfere seriously with what you're hearing, and cause your work to suffer.

### REMOTELY INTERESTING

Unlike mainframe computers or professional video decks, which are usually in a machine room separate from their operators' primary work area, most personal computers aren't designed to be anywhere but right on your desktop. Remote operation rarely figures in the thought processes of personal computer designers. The cables that generally come with personal computers — monitor, SCSI, and keyboard — are all short, and if you ask a computer retailer

for a longer cable, you'll probably be met with a blank stare. And don't forget that there's a limitation on cable length built into one of the most important protocols of the personal computer world: SCSI (which, remember, stands for Small Computer Systems Interface). The SCSI specification itself limits the total length of a SCSI chain — that is, all the cables connecting all the devices in the chain, including any internal drives — to six metres, or about 19.5 feet. Not very far.

With a little ingenuity, some of these limitations can be overcome. First things first: let's move the computer out of the studio, and then we'll figure out how to hook it up. If you have another room adjacent to your control room, think about stashing the computer over there. Put the computer close to the common wall (although not necessarily *right against* the wall, because that might allow vibration to come through), and then punch a hole in the wall big enough for all of the cables to go through.

A more convenient solution is a cupboard or closet right in the control room — either one already there, or one you build. The most important thing to keep in mind when stashing a computer in a closet, however, is to make sure it gets plenty of fresh air. So instead of simply shutting the equipment away, cut away about six or eight inches at the very bottom and top of the door, to create a kind of chimney. Cover the gaps with foam from an air-conditioner filter to reduce the noise level and keep dust away from the machinery. Build a shelf or use a small table to get the computer off the floor, but don't make it so big that it cuts off the vertical air circulation. Put the computer and other hardware on some more foam to cut down on vibration transmission. You may even want to put in a small low-noise fan in the closet to draw air upwards. Mount it on a wall (not the door) above the computer. To access removables, you can simply open the closet door, or else build in a small door right in front of the drive opening(s). Use Velcro or a wooden hasp to hold it closed — a metal latch might vibrate.

### CABLE BUY!

OK — now that it's safely out of earshot, how do we control this gear?

• **SERIAL STUFF:** We need cables for keyboards and mice, monitors, and serial devices. Serial cables for a Mac or PC are no problem — these

*Removing hardware such as computer CPUs from your immediate studio environment can create a more peaceful atmosphere.*



can be pretty much as long as you like, assuming that you start with decent-quality cables.

- **MAKING THE SWITCH:** If you need to change cables a lot, like between a MIDI interface and a modem or printer, and the computer's new location has made this difficult, bring a cable from the serial port out to an external switch mounted in a convenient place, and connect your peripherals to the switch.

- **MAC FACTS:** Keyboard cables for a PC are easy to extend, but on the Mac things are a little more complicated. The Mac's Apple Desktop Buss (ADB), which connects the keyboard, the mouse, a trackball or pad, some modems, and the occasional hardware dongle to the computer, uses a special round connector with four pins and a rectangular 'key', to make sure it is oriented correctly. Although ADB runs can be quite long, dedicated cables greater than six feet are hard to find, and they tend to be expensive.

If you go to a video store, however, you will find perfectly good ADB cables, of all sorts of lengths, at quite reasonable prices. That's because *ADB connectors are identical to connectors used for S-VHS video*. Your local Tandy won't have them, but a dealer who caters for video professionals should have S-VHS cables in abundance, in lengths of anywhere from five to 50 feet — or even longer.

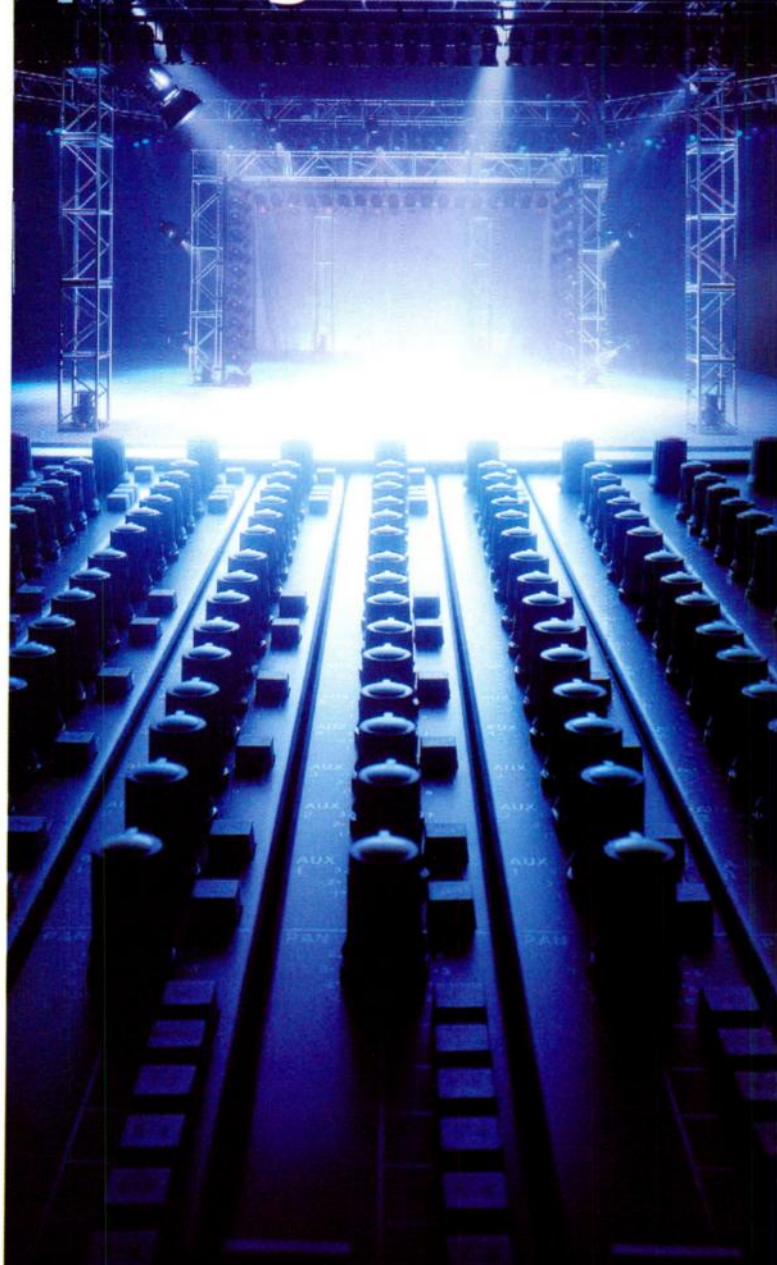
- **SCSI LOGIC:** As far as SCSI cables are concerned, if all your various drives are crammed into the closet with your computer, length is not an issue. But you should use the shortest cables you can get away with, not just to keep down the clutter but also to prevent the weight and odd angle-forces caused by longer cables from straining the connectors. If you have devices stacked on top of each other, you may be able to use rigid 'C' connectors, which literally clamp in place behind two SCSI devices, and form a solid connection while keeping the signal path length down to the absolute minimum.

“For a musician, having a high ambient sound level in a music studio is like an artist working in a room where the walls are painted fluorescent paisley.”

Sometimes, however, you need to run SCSI cables to devices that are located some distance from each other. For example, you might have a sampler that you want to use with the CD-ROM or Zip drives that are attached to your computer, or you'd like to exchange samples between it and the computer, over SMDI. If the cable you need is going to be any greater than six feet long, get the very best quality you can find. Make sure the cable is at least double-shielded, with both copper braid and aluminum foil protecting the conductors. A cheaper cable may seem to work, but it's the nature of SCSI problems that they come and go, and a cable that is marginal may be OK one day and throw a tantrum the next.

- **THE TERMINATORS:** If you have a complicated SCSI setup, or if you move devices in and out of your system often, you might want to invest in some of the sophisticated analyser/terminators that are now available. These can alert you to problems with termination (and automatically fix them), voltage drops, and

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# Reducing Ambient Studio Noise

► impedance conflicts. Another useful device is a 'hot swapper', which lets you switch SCSI devices on a chain without powering the whole system down.

• **STAYING SINGLE:** Use a single long cable to do longer runs, rather than stringing shorter cables together; the connectors themselves contribute to signal loss, so the fewer of them the better. High-quality 12-foot male-to-male and male-to-female cables shouldn't be hard to find, although be prepared to spend some money.

## SCREEN GEMS

Finally we come to monitors, an area where it seems that nobody knows nothin'. I discovered this unfortunate fact in a recent redesign of my studio — it took about two months for me to piece together all of the solutions. Granted, my needs were rather special: I have an office and a studio in separate rooms, each with a monitor (one 17-inch VGA, one 19-inch BNC) and keyboard, but connected to a single computer (which lives in a closet between them). But even if I were just trying to get my monitor away from my computer, I would have come up against the same problems.

If you just stick an extension onto a monitor cable, whether it's Mac-style (which uses a DB-15 connector, with 15 pins in two rows) or VGA (DB-15HD, which arranges the pins in three rows),



'Double-shielded' cables may not be good enough; 'individually shielded', in which each of the internal cable pairs has its own shield, is what you want. As with SCSI, using one long cable is far better than adding extensions — the connectors themselves serve as entry points for interference.

Many monitors, particularly those made by Sony or NEC, use multiple BNC connectors. They need to be hooked up to your computer with a 'breakout' cable, which splits the signal from the VGA or Mac video connector into three, four, or five individual components: Red, Green, Blue, and possibly Horizontal and Vertical sync. Each component has its own shielded connector, and there again is the key to making long cable runs work: individually shielded cable. But rather than use an extension for the DB-15 or DB-15HD, use as *short* a 15-conductor cable as you can, putting the breakout as close to the computer as possible. For the rest of the run, use multiple coaxial cables with BNC connectors on each end. It's not as neat as using a single cable, but your eyes will thank you: runs of 50 feet or more with no picture degradation are not a problem. Again, a good video supply house will have the BNC cables in the lengths you need.

Finally, if you have to deal with really long monitor cable runs — or multiple monitors, such as in my studio — you should look into a video booster/distribution amplifier. This device raises the signal level, so that it can easily overcome all sorts of noise problems, and thus run great distances. Various configurations are available, in both Mac and VGA, with up to eight outputs. One warning: if you have a short video cable from an older Mac, in the days before Apple supplied monitors with permanently attached cables, and you're tempted to use it between your computer and a video amplifier, don't. Those older cables did not have all the pins wired, and they won't work with any monitor or peripheral that needs all of the pins, which most do today.

## QUIET LIFE?

Good luck in getting your noise level down below a dull roar. Perhaps someday, low noise levels will be a common design goal (and specs that feature noise levels will be available), and we can put our computers back on our desktops. For now, hopefully these hints will let you keep the noise in the closet, where it belongs.

SOS

## MONITOR MAGIC

If you're using a Mac and having trouble with monitors in general, a sync adapter from Griffin Technologies in Nashville, Tennessee, can be a big help. This little in-line device takes care of a lot of problems by essentially fooling the Mac into thinking one kind of monitor is hooked up, while it converts the signal so that it can be displayed by just about any monitor, at any resolution, and at any sync speed. It is essential (and is often included with) any monitor that measures 19 inches or larger. For using VGA monitors with a Mac, Griffin also sell a flexible Mac-VGA adapter.

Griffin products can be obtained in the UK from: Alta Technology, 111 Park Hill, London SW4 9PX. Tel: 0171 622 6606.

You can email Griffin on: [griffin@telalink.net](mailto:griffin@telalink.net) or visit their web site at: <http://www.nashville.net/~griffin/>

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chances are you will have to deal with signal loss, line noise, interference, and other factors that will seriously degrade the picture quality. This can result in washed-out colour or 'ghosts'. While the former is ugly, the latter can cause serious eye-strain if you stare at them for too long, and staring at a computer screen for too long is something we all do a lot of the time. If your monitor is an energy-saving model, you may find that the signal level drops so low that the monitor sometimes won't even kick out of sleep mode.

Once again, using top-quality cables will help.



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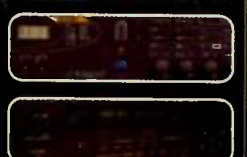
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**PAUL WHITE** explores  
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space with the first  
of a new generation  
of effects processors  
from Lexicon.

Last month, we previewed Lexicon's new MPX1 digital effects unit. Now we've managed to get hold of one for a little longer — and this time it's equipped with the latest software. Judging by the introduction in the manual, this is just the first of a new series of Lexicon mid-price effects units. In the case of the MPX1, the underlying philosophy seems to be to provide access to multi-effect algorithms while not compromising on reverb quality. By contrast, some multi-effects units divide their processor power up in such a way that the more effects you have, the less power can be dedicated to reverb.

Lexicon get around this by using one of their LEXI Chip 2s to handle the reverb, and a separate DSP to handle the remaining multi-effects. In this respect, the architecture is not dissimilar to that of the PCM80, which also uses a LEXI Chip 2 plus a DSP chip, but the MPX1's processor can create more simultaneous effects than the PCM80 is able to. However, the PCM80 uses both the LEXI Chip 2 and the DSP to build its reverb algorithms, so this would suggest that the MPX1 reverbs are slightly less complex than those in the PCM80. In fairness, one shouldn't compare the PCM80 with the MPX1, as they are designed for quite different tasks — but people are bound to ask!

In theory, the MPX1 can handle up to four effects at one time as well as stereo reverb — the

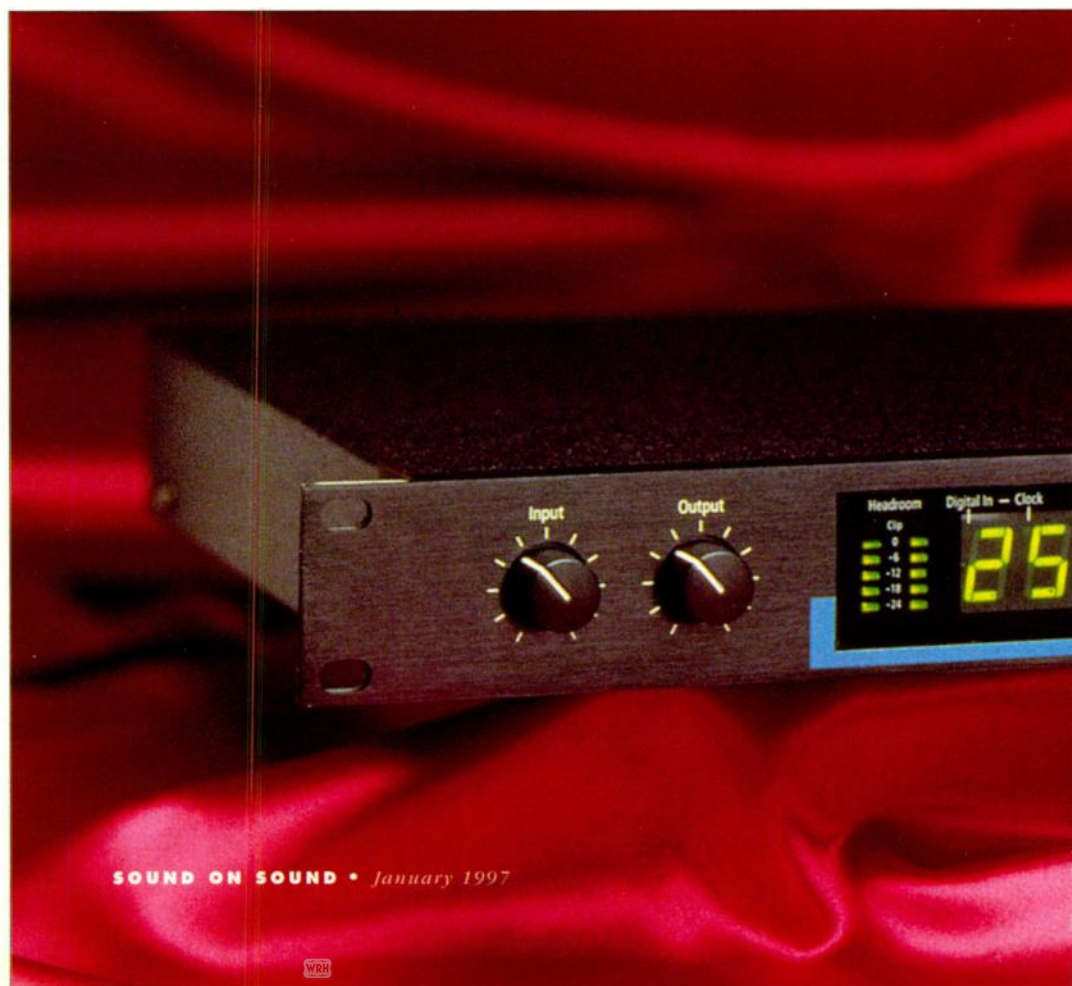
first preset manages five, but one of these is only volume. More often than not, you're restricted to reverb plus two or three additional effects, depending on which algorithms are chosen. The basic effects types are listed as Pitch, Chorus, EQ, Mod, Delay and Reverb, though as you might imagine, these are further sub-divided and, in fact, provide 56 different effect algorithms in all.

To clarify the MPX1's market position, the new unit comes beneath the PCM80 but well above the LXP15. The PCM80's sophisticated multi-tap delay architecture allows it to produce resonant chord programs as well as complex stereo delays, and it also has more complex editing options. What's more, the PCM80's card slot enables the user to load in new algorithms, not just new presets. On a subjective level, the reverb section of the MPX1 sounds roughly comparable to that of the PCM80, though some of the algorithms differ in structure and type and they don't have such sophisticated delay elements around them. However, the MPX1 has Ambience algorithms, which the PCM80 does not have. Before the MPX1, you had to buy a PCM90 or one of the high-end units to get the Ambience effect, and while the algorithm has been scaled down to make it run on a single LEXI Chip 2, it still sounds extremely good.

Lexicon are aware that in-depth programming of the PCM series is quite heavy going, so they've

# SPACE CRAFT

LEXICON MPX1 REVERB AND MULTI-EFFECTS PROCESSOR





given the MPX1 a new and ostensibly simpler operating system, including a comprehensive database sorting option. Here effects can be sorted by name, number, source type or effect type.

To make the MPX1 as flexible as possible, the effect blocks may be connected in any order (up to the maximum the processor can support), with numerous series/parallel routing options. Each block can be edited independently, and many effects have tempo-related functions that can be modified by means of a real-time tap function. The comprehensive internal modulation matrix has been brought over from the PCM series, allowing various effect parameters to be modulated via on-board LFOs, input envelopes, pedals, MIDI data, arpeggiators, random function generators, and so on. While you don't have to get involved with this if you don't want to, it does allow the ambitious sound designer plenty of scope for creating unusual effects that respond to the dynamics of the signal being treated. What's more, the arpeggiator may be triggered by a single MIDI note to produce an arpeggiated MIDI output for driving other MIDI sound modules.

Some of you may remember the Lexicon Vortex, a delay/modulation box with some interesting morphing capabilities. The morphing process involves the real-time modification of the parameters of one effect so that it gradually changes into a second effect. Often, some extremely unusual iterations are to be heard along the way. While the Vortex was a budget box and had several weaknesses which Lexicon readily acknowledge, the morphing concept was a good one, and has been included in some of the MPX1's preset effects. If morphing is available from within a patch, the A or B LED adjacent to the A/B button will light to show that it can be used. When you program your own effects, any parameters can be

patched to morph between two sets of values.

Taken in isolation, most of the effects are very familiar, but the ability to route them in various configurations, and to modulate, or even morph, them in unusual ways means that some of the effects sound far more complex than you'd expect from looking at their component parts. Another surprising inclusion is a sweepable analogue filter emulation, which may be controlled by input envelopes, ADSRs, LFOs, MIDI note triggers, and so on, in true analogue synth fashion.

## THE HARDWARE

In its styling, the MPX1 follows the usual Lexicon 1U format, and features the PCM-series black and blue livery, but the control surface is quite different to the PCM series, and seems a little simpler. Both an alphanumeric display window and a large numeric indicator is fitted, and a quick glance around the back reveals both balanced XLR and balanced jack audio ins and outs (switchable -10/+4), S/PDIF digital I/O on gold-plated phonos, a full complement of MIDI In, Out and Thru sockets, and two control jacks for a footpedal and a footswitch. Power is directly from the mains — no adaptors.

The front-panel controls are limited to input and output level knobs, a data entry Value knob and two small groups of buttons, one set relating to the effect blocks and the other to access various editing options. Tap and A/B buttons provide a real-time means of interacting with the effects — see 'Tap & A/B Buttons' box for details. The Value data knob does different jobs depending on whether you're in Program or Edit mode, and on whether or not the Value button has been pressed. When Value is pressed, the functions of the knob and the left/right arrow keys are reversed. While this means you can decide

## pros & cons

### LEXICON MPX1 £1199

#### pros

- True 'big' Lexicon sound quality.
- Can be approached on a number of levels, from mild preset twiddling to complex sound designing.
- Extensive control and modulation facilities.

#### cons

- Pitch shifter not entirely smooth.
- Only 50 user memories and no expansion card slot.

#### summary

Though still not a budget unit, the MPX1 does bring serious Lexicon reverb and multi-effects quality to the mid-price range.

**SOUND ON SOUND**





# LEXICON MPX1

► whether to use the knob or the buttons to work with (and there's no disputing that it's fast when you're working your way through long menus), I found it potentially confusing and frequently hit the wrong control, leaving me to figure out how to find my way back.

It's worth mentioning that Lexicon have worked hard to reduce the time it takes to change patches. They seem to have achieved this by

**D=p=R=e=C=m**

where the effects in use are those in upper-case, and the lines between show the routing.

Once in the Routing Map, the various available algorithm options can be stepped through for each effect block, and as illustrated in the previous example, inactive effects blocks are shown in lower-case letters. User patches are created by editing any existing patch — you can tell which blocks are currently active in any patch, because the corresponding named effects buttons light up green. Effects within a patch can be turned on or off using these buttons, without having to enter edit mode.

Pressing Program shows the effects used and the way in which they are connected. Inactive effects blocks can be turned on if there's enough DSP power left to handle them; if there isn't, a 'Won't Fit' message flashes up on the screen. If you attempt to edit an effect that's turned off, you get a warning message telling you it's not active.

So far then, effects blocks may be turned on or off, the order and routing of the blocks may be changed, and the effect algorithm type within each block may be selected from the menu of available options. Once you've settled on the effects types and routing, the individual effect parameters may be changed as required, as may the dry/effect balance of each block. Finally, you can set up modulators, such as LFOs, envelope followers or MIDI controllers, then use them to modulate destination parameters within the various effect blocks. Effect blocks can also be copied from one program to another.

## MIDI

The MIDI implementation is characteristically thorough, and includes up to three MIDI patch maps. All the unit's effect parameters may be accessed via MIDI, and of course patches may be called up via MIDI too. The mod wheels on a synth may be used to control continuously variable effect parameters, such as filter frequency, and in true US fashion, Lexicon have registered the term Dynamic MIDI to describe this function.

As well as receiving MIDI data, the MPX1 can also transmit MIDI data in response to movement of the control knob or a footpedal connected to the rear-panel jack. MIDI is also transmitted when the arpeggiator is used. When an MPX1 controller is assigned to a MIDI controller, the MPX1 will also respond to incoming controller messages of the same type, exactly as though its own controls were being used. For example, if the Value knob is set to send MIDI sustain messages, the MPX1 will interpret incoming sustain messages as though the Value knob itself were being turned — providing that a patch including that destination parameter is loaded. A MIDI Learn mode is also provided which recognises the MIDI source automatically when you're setting up such things as MIDI controllers. ►

getting the various effect blocks to load in order, and while the beta software took the best part of a second to change patches, the latest version seemed at least four times as fast.

## ORGANISATION

In all, there are 250 on-board memory locations, configured as 200 presets and 50 user patches. Calling up a patch is a matter of using the value knob to scroll through the patches while in Program mode, then pressing Program to load the patch (though there is also a direct load mode available). Prior to loading, the Program button flashes, while after loading, the button remains steadily illuminated. Patch names and database sort category are shown in the LCD window, while the patch number is shown in the numeric window. If a patch is edited but not stored, an asterisk shows that the previous values have been changed. This window also shows the digital input status and the MIDI clock rate.

Unlike the PCM-series processors, there's no provision for using a data card to expand the number of user patches or to import third-party patches, though data can be saved and loaded via MIDI SysEx dump. To simplify editing, soft controls provide quick access to frequently-adjusted parameters for each patch without having to enter edit mode.

The unit may be set for stereo input or for a mono feed to either of the two inputs, and the mono/stereo designation also carries over into the digital I/O. A degree of digital gain control is available for level matching. As mentioned earlier, the MPX1 has a very flexible routing system, and fundamental to this is the ability to create two parallel chains of effects which are mixed together later in the chain. Lexicon call these the upper and lower path. Each block has its own dry/effect mix parameter, and the connection between blocks can be handled by virtual patch cords (shown as short lines in the LCD window), for stereo, left only, right only, left out to both ins or right out to both ins. For example, I put together a rather nice ethereal patch using just delay, reverb and chorus, and on screen it appeared as follows:



## MPX1 EFFECTS

- PITCH
  - Detune M
  - Detune S
  - Detune D
  - Shift M
  - Shift S
  - Shift D
  - Volume M
  - Volume S
  - Volume D
  - Test Tone
- CHORUS
  - Chorus
  - Flanger M
  - Flanger S
  - Phaser
  - Rotary Cab
  - Aerosols
  - Orbits
  - Centrifuge 1
  - Centrifuge 2
  - Comb 1
  - Comb 2
- EQ
  - 1-Band M
  - 2-Band M
  - 3-Band M
  - 4-Band M
  - 1-Band S
  - 2-Band S
  - 1-Band D
  - 2-Band D
  - Sweep Filter
  - Wah
- Fc Splitter
- Crossover
- 2-Tone M
- 2-Tone S
- 2-Tone D
- 3-Tone M
- 3-Tone S
- 3-Tone D
- MODULATION
  - Panner
  - Auto Pan
  - Tremolo M
  - Tremolo S
  - Overdrive
  - Volume M
  - Volume S
  - Volume D
- DELAY
  - Delay M
  - Delay S
  - Delay D
  - Echo M
  - Echo S
  - Echo D
  - Looper
  - Ducker
- REVERB
  - Chamber
  - Hall
  - Plate
  - Gate
  - Ambience



# Nord Lead V 2.0

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

### New Version 2.0 features: Analog Drumsounds!

Looking for that good old analog drumsound? Look no further.

Go down to your music store and check out the new Nord 2.0. It's loaded with exciting percussion sounds, the sounds you have been looking for. The Nord Lead/Rack 4-voice version comes with 10 analog percussion kits in ROM right from the start. The Percussion kits are editable, you save them via SYS EX Dump. An expanded Nord can hold an additional 30 programmable percussion kits on a PCMCIA S-RAM card.

It's a breeze to work with percussion sounds in the Nord. You can use up to 4 different percussion kits of totally 32 sounds simultaneously on 4 MIDI channels. The percussion sounds are configured in 8 different zones on the keyboard. The 8 different sounds can easily be edited in real time. When you use the Nord in a multi-instrument set up, you can assign a percussion kit to one MIDI channel and use the other three channels for basses, leads or pads sounds.

### A lot of sounds to start with!

The Nord 2.0 comes with several great analog single sounds and exciting "Layers" saved in 100 new Performance factory programs. You'll find great sounds from the past, today and for the future programmed by international sound designers. By using the unique features of the Nord, the 4 slot configuration and the "Morph" function, they have created exciting pads sounds, awesome leads and monster basses.

### Try the Echo!

A new feature in the Nord is the Echo effect. The Echo will be influenced by the unique "velocity programming" (morphing) feature of the Nord.

### More arpeggiator effects!

It's now possible to run the arpeggiator notes randomly.

### New Filter option!

A new filter is implemented into the Filter section. A Notch filter in serie with a Lowpass Filter.

### Additional MIDI features!

The Octave Shift button is now being transmitted and received making it possible to play other octaves on sound modules from the Nord keyboard.

"After Touch" is now being received. It can be assigned to LFO 1, LFO 2, OSC 2, FM or Filter.

Arpeggiator notes can now be transmitted via MIDI.

### Additional Pedal functions!

An expression pedal can now be assigned to LFO 1, LFO 2, OSC 2, FM or Filter working independently of the modulation wheel.

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# LEXICON MPX1

► Bank Select provides access to all 250 on-board effects, as two banks of 100 presets and one bank of 50 user patches. A full SysEx mode is provided for the benefit of those people wanting to write editing software for the MPX1, and the unit also recognises Reset all Controllers, which has the effect of resetting patched parameters to their stored default values.

The tempo source can be set to MIDI (MIDI Clock) in the System menu, and it is also possible to sync

Vortex. Rotary speaker effects are also included.

Unlike the multitap delays of the PCM80, the MPX1 is limited to just two taps, but there are still plenty of usable options, including ducking delay and an infinite looper. Unusually, a test-tone oscillator is provided, which can be set to any chromatic musical tone. This is employed in one or two of the sound effect patches.

The reverbs are classic Lexicon, and all include pre-delay — so you don't have to rob your delay



LFOs to MIDI by setting their tempo source to MIDI. You can even use MIDI clock as a dynamic controller, where the tempo range 41-350bpm corresponds to controller values 0-127. Dynamic MIDI patch sources are: MIDI controllers 1 to 119, Pitch Bend, After Touch (Poly and channel combined), Note On Velocity, Last Note, Low Note, High Note, Tempo, Clock, Clock Commands (MIDI Start, Stop and Continue), Gate Switch, Trigger, L (Legato) Gate and Touch Switch (derived from aftertouch).

SysEx data dumps can handle either the current patch or multiple patches, as well as maps, chains and setups.

## THE EFFECTS

The effects repertoire covers all the usual chorus, flanging, phasing, delay and reverb treatments, as well as pitch shifting and EQ up to four bands. Less obvious inclusions are crossover and frequency-splitter modules, sweepable resonant filters, wah wah, overdrive — and, by using the arpeggiator source, synth-style arpeggiation. The overdrive isn't intended for serious guitar applications, but more for 'flavouring' sounds like organ patches, or for adding an aggressive edge. The chorus section also has some less obvious variants, such as the Aerosol stereo chorus/flanger and the Orbits modulated delay/panner, taken from the Lexicon

module. In common with other Lexicon high end units, the reverb tails are exceptionally smooth and natural, the sense of real space is uncannily convincing, and no matter how thick you lay it on, the original sound never seems to get swamped. The basic types are Chamber, Hall, Plate, Gate and Ambience — reverse reverb is available within the gate algorithm. To my ears, the quality of the reverb is the equivalent of that in the PCM80, and having the wonderful Ambience algorithm is a real bonus. In fact, the only effect that disappoints in any way is, predictably, the pitch shifter. Unless restricted to mild detuning effects, the inevitable modulation creates an artificial, slightly out-of-tune effect, and though the unit performs rather better than most budget unit in this respect, the side-effects are still intrusive enough to put me off using it for anything other than special effects. Various shift modes are available to optimise the performance to the type of signal being processed. The range of -4800 cents to +1900 cents at least means that you have plenty of scope for weird special effects, if weirdness is your thing!

Technically, the effects are superbly clean, with a frequency response of 20Hz-20kHz (+/-1dB) and a 95dB signal-to-noise ratio. The delay from analogue input to analogue output due to digital conversion is 1.82 milliseconds at a sampling frequency of 44.1kHz.

## USING THE MPX1

Though the MPX1 is arguably simpler than most serious Lexicon units, it still shows the same attention to detail; for example, the explanation of the Bypass switch takes up one and a half pages in the manual, to cover how the bypass is operated and whether it should act as a true bypass, an input mute, or an 'all mute'. Similarly, you can select auto or manual program load, change the database criteria by which patches are identified and set how the internal oscillators and envelopes should behave. The digital I/O has

“To my ears, the quality of the reverb is the equivalent of that in the PCM80.”

## TAP AND A/B BUTTONS

The Tap button and tempo LED provide a direct way of changing any tempo-related (delay and mod rate), parameters that have been programmed into a patch. When a patch with tempo control is loaded, the Tempo LED will flash at the current tempo rate; pressing the Tempo button twice at a new tempo will update all relevant effects parameters on the fly. Note that you can override any individually-set tempos by setting a global tempo in System Setup. Tempo may also be used as a patch source for controlling effect parameters.

A/B allows front panel access to the morphing functions, where any group of effect parameters can be patched to change value when the button is pressed or when morphing is initiated by any other means. When a parameter is set to morph, the start, end and glide rate values can be set up in Edit mode, and triggering can be initiated from internal sources, such as signal levels, external pedals or MIDI. The type of effects you can get include rotary speaker cabs with 'run up and down' speed changes, tape style, non-cyclic flanging, and effects that change in depth, timbre or decay time.







# LEXICON MPX1

- a built-in error log, there's a soft-knee analogue limiter that can be patched into the input to help prevent overload (something I've been harping on about for years!), there are master mix and tempo functions that can override the values set in each patch, there's a MIDI implementation as long as your arm, and there's even a section for calibrating the response of an external control pedal. What's more, the manual actually tells you what sort of switches and pedal may be used, complete with diagrams and potentiometer values — more manufacturers should be this thorough. When it comes to basic operation, the manual

“In common with other Lexicon high end units, the reverb tails are exceptionally smooth and natural, the sense of real space is uncannily convincing, and no matter how thick you lay it on, the original sound never seems to get swamped.”

is commendably approachable, combining clear instructions with useful block and menu diagrams. Even so, there were times when I got lost, usually because I turned the knob instead of pressing a cursor button, or vice versa, and quite often there seemed to be no easy way back to where I wanted to be without going back to Edit and starting over. No doubt this comes with practice, and when you look at the various menus laid out in the manual, they're really quite straightforward.

Programming new effects is reasonably painless, unless you get heavily involved in patching modulation sources to parameters, in which case you might do well to write a few notes on what you hope to achieve before you dive in. The physical act of assigning sources and destinations isn't a problem, but you do have to consider the effect of the modulation, as it can both add and subtract from the default parameter value, depending on the nature of the source. However, it's worth persevering, because the modulation capabilities of the Lexicon range are the key to some of the most dramatic and dynamic effects on the planet.

## SUMMARY


The truth is that there are just too many hidden aspects tucked away inside this unit to mention in a relatively short review. To fully explore a machine like this would take months, so it's not a unit you'll grow out of, but it can also be used at a fairly simple level straight out of the box — you

don't have to tackle a steep learning curve before you can get any results.

The 'Soft Value' feature is an excellent way to explore the presets, because you can access the key three or four parameters of each effects block just by hitting Value and then stepping through the options. Similarly, you can press Mix when in Program mode and do a similar thing with the dry/effect mix balance of each effect block. When you want to go further, enter Edit mode and the individual effects block buttons get you into a useful copy mode where you can copy an effects block from any of the other patches for use in your current patch. It's all there — editing at any level from a passing schmooze to a close encounter — and several stages in between.

The effects themselves are quite lovely, especially the reverbs. Around a dozen parameters per reverb block are available for editing, including Shape and Spread, but excluding Spin and Wander. If these are the same algorithms used in the PCM range, I assume these parameters are preset. Ambience is a particularly effective treatment, as it allows a sound to be given real presence and depth without making it muddy or obscuring the detail of the sound.

Also worthy of mention are the supremely clean chorus effects, some of the best flanging algorithms since the Electric Mistress (but without the noise-to-signal ratio!) and the surprisingly analogue-sounding swept resonant filter. The factory patches cover a useful range of effects, most of which are musically valid, and it's very easy to fine-tune these to your own needs without getting to deep into edit mode.

Weaknesses are few, but aside from the inevitable pitch shifter, it's also less than obvious how many effects you can get going at once until the 'No room at the inn' message comes up, so it's best to pick an existing program that uses the blocks you want before editing. On balance, though, this is a very polished unit, with impeccable sound quality, totally uncompromised reverbs and some multi-effects that stand head and shoulders above the more obvious delay/chorus/reverb things we hear so much of. The price is little over half that of a PCM80, and though the PCM80 is a more flexible and professional tool aimed at a quite different market, in the MPX1, Lexicon seem to have succeeded in building a stunningly good multi-effects box that pulls far more tricks out of the hat than any of the similarly-priced competition. For both the audio professional and the serious enthusiast who aspire to 'grown up' Lexicon quality but without the price tag, the MPX1 really delivers. 

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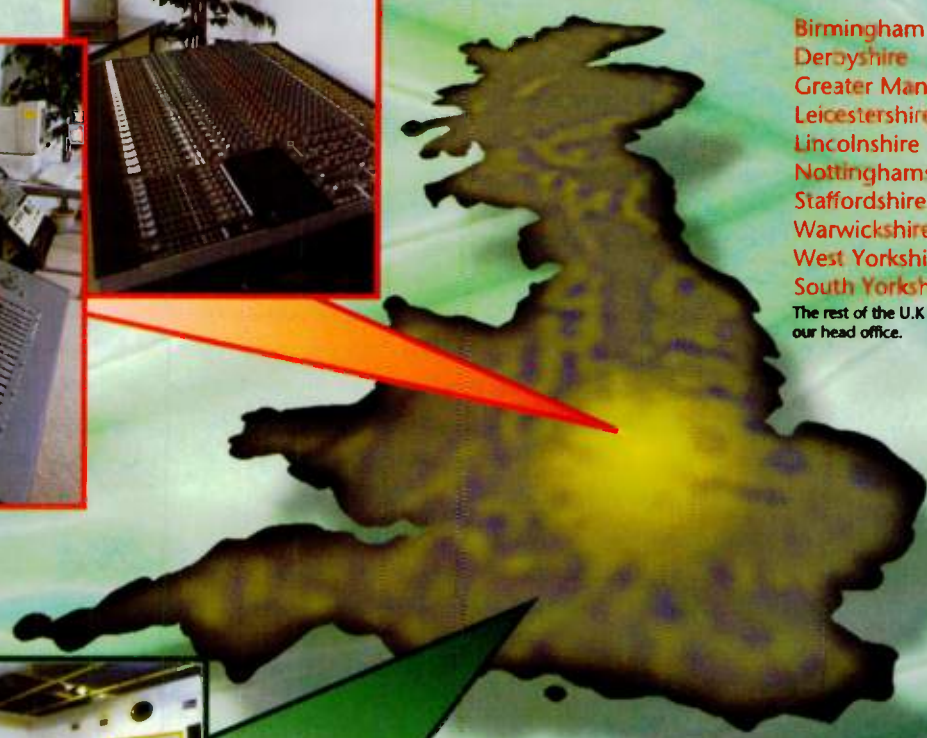
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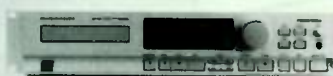
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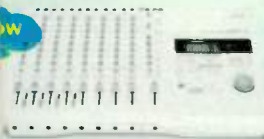
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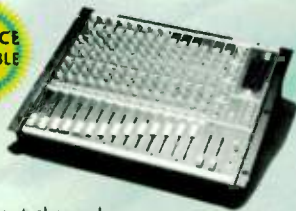
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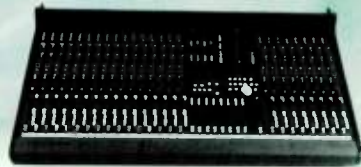
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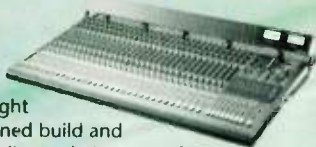


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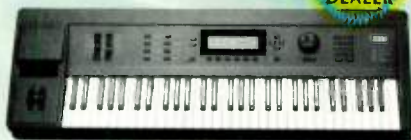
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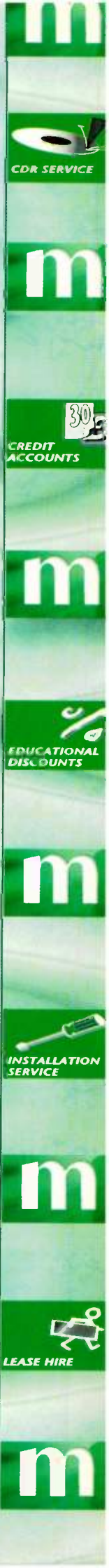


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# Independent

THE USA'S LOW-BUDGET RECORD REVOLUTION

*The proliferation of independent record labels in the USA has increased the demand for low-budget records, and sparked the home music studio market, moving it from spare bedroom demo mill to centre stage. Our man in America, DAN DALEY, reports.*

**W**hen personal recording technology entered the scene around 15 years ago, it seemed like manna from heaven — it enabled those who were spending hours in rehearsal studios (in order to perfect arrangements and avoid running up studio bills) to create a very close approximation of what the finished demo tape would sound like. In many cases, it released them from commercial studios completely. And those who didn't have the studio budgets in the first place for demos were now freed of the notion that the best they could do was to set up a stereo cassette player at a gig and hope for the best.

Personal recording equipment has ignited several significant cultural trends in music since its appearance, from the return of the singer/songwriter (who no longer had to put up with a band) to the demise of the commercial jingle industry, which is now pretty much based in people's homes. Now the personal recording revolution is entering yet another evolutionary cycle. The proliferation of independent record labels — in part prompted by the accessibility of personal recording technology — is creating significant demand for low-budget

“When personal recording technology entered the scene around 15 years ago, it seemed like manna from heaven...”

records. Independent record labels in the USA were, as a group, the seventh-largest distribution entity four years ago, just behind the six major label groups. As of 1996, independents are number two, behind only the megalithic Time/Warner. This situation has created a double trend in the process: many recording artists have expanded their personal recording setups to the point where they can comfortably make commercial-level records in their own studios. Others are finding that more and more traditional studios are available that can accommodate the medium-level budgets that have characterised this new strata of recording. In the process, this so-called 'middle class' type of facility gets a long-needed boost after years of losing economic ground to home recording.

## MAKING IT AT HOME

Mark Robertson and his San Francisco-based band, Cairo, are the paradigm of many contemporary independent recording bands: upon signing with Relativity/Sony-distributed indie label Magna Carta, of New York, the band elected to put their record budget into recording equipment, in this instance a pair of Alesis ADATs and two Mackie 1604 mixers, as well as assorted outboard and Tannoy DMT12 monitors, all fitted into a renovated office space, configured as a control room, tracking room and two isolation booths. “The plan was that, regardless of what happened at the end of our four-record deal with Magna Carta, when everything was said and done, we'd have a studio we could use for our future projects and other records we wanted to produce,” explains Robertson. As it turned out, the band's first release sold a total of 26,000 units, 18,000 of which were sold in Asia, via a local distributor. But taking the cash advance and buying equipment is becoming more and more common. “The thing is, at the end, you have something to show for your efforts besides a CD that may or may not have sold,” he says.

They also have something to invest in; the band recently upgraded to a Mackie 8-buss console with Ultramix automation. But in the process of converting a record advance into a studio, Robertson says the band went through a learning experience. “We engineered it ourselves, and we spent a lot of the four months it took to make the record trying to figure out the automation and other systems,” he says. “There were moments when it took away from what we were trying to accomplish.” The EQ on the original consoles was fairly rudimentary in retrospect, and keyboard player Robertson comments that the band used a Hammond C3 and a lot of analogue synths, instead



# ents Day

of digital ones, in trying to warm up the record's sound, as well using as tricks like running the bass through a preamp to add some grit to it. "If you do it yourself, you have to be prepared to try a lot of things that may or may not work in order to make a competitive-sounding record," he says. "You're up against records being made in studios for a lot more money, so you have to take the time that having your own studio gives you to counter-balance that."

John Elefante, former lead singer with Kansas from 1982 to 1986, uses the home studio as both a refuge and a centre for his Contemporary Christian music productions, which include his own critically-acclaimed *Windows On Heaven* on Word Records, and records for CC acts Guardian, Petra and St Elmo's Fire. That's when he's not working at Sound Kitchen, the two-room, Neve VR-equipped studio he and his brother Dino own and operate in the Nashville suburb of Brentwood. Dubbed The Snack Bar, it's a quintessential personal studio, with a Mackie 32-channel console, four Tascam DA88 digital 8-tracks, and an imposing rack of keyboards and sound modules, all fitted inside one-and-a-half bays of a partially converted five-car garage at his Brentwood home. Contemporary Christian records

serve as an interesting template for what has happened in the US independent record market as a whole. Budgets in that genre have increased somewhat, but it's still not unusual to see records being made for \$5000-10,000 in total. Major-label Christian records run between \$20,000 and \$80,000, with larger budgets reserved for the genre's few megastars, such as Michael W. Smith. But producers and artists such as Elefante grew up in lower-budget environments and have learned lessons from them. For starters, the level of equipment needed for recording and for mixing is different, and independent record projects should be aware of that and, when possible, allocate part of the budget appropriately. "It's not the equipment that brings them to you," Elefante says, acknowledging the plebeian connotations of having signal processing such as an Alesis Midiverb and a Lexicon Alex as primary reverbs. "It's what you can do with it."

"I have access to a couple of Neve VRs at Sound Kitchen, but quite frankly I think that 72 inputs is overkill during the interim stage of a recording," he observes. "I can track and mix at a larger studio, but I'm more comfortable here for tracking and overdubs." The inherent limitations of the personal ▶

## CASE STUDY: NEIL ZAZA

Neil Zaza is rapidly becoming another Steve Vai, in that he's a guitarist who can build a career on instrumental records. His first two releases — one on his own label, the second on a small independent called BMA — sold a combined 20,000 units and were recorded in small local studios in Ohio and Texas. "At that point, I realised that all I had to show for those two records were the records," he says.

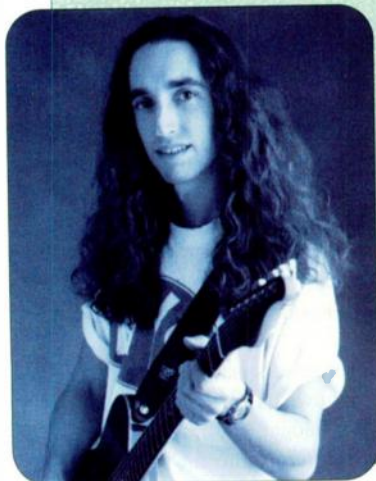
"For the next record, I decided to invest the advance into recording equipment, so that I'd have the record and a studio to show for it." His new release, *Sing*, on High Chief Records and with much wider national distribution than the previous two releases, had a budget of about \$12,000, with which he decided to go digital, purchasing a Fostex D80 hard disk recorder, three Alesis ADATs, various Mac programs such as Digidesign's Pro Tools, Mark Of The Unicorn's *Digital Performer*, Macromedia's *Deck* and Passport Designs' *Alchemy*. He also purchased a Mackie 24-channel console.

But two records made on similar budgets in commercial studios taught Zaza a lesson even before he started. "I realised that I could use both environments to their best advantage," he explains. "I don't have a great tracking room at home, so I would use a studio with one for drums and guitars, then bring those tracks home for overdubs and editing." While the ADAT has become a fairly ubiquitous format, it's not quite everywhere yet, so Zaza relied heavily on his D80 hard disk system and its portability, which

allowed him to bring the 8-track system into various outside studios, cut tracks, then bring them home — backed up to a Fostex RDS DAT machine — for further recording. "I would record to the D80, then offload from that to one of the sequencer programs, do things like combine solos, then dump it back to the D80 for additional recording," he says. "It was an incredibly flexible system. It helped also that it happens to sound excellent, as does the Mackie console."

The issues that cropped up around this approach were ones of creativity and control. "This was a record that used multiple recording and editing formats," Zaza notes. "So you have to be aware first of how you make your choices for each move. I based those decisions on which systems interfered least with creativity — which were easiest to use given the complexity of the work. That's really the crux of the matter: I'm an engineer, but I knew when I needed to use another engineer so I could concentrate on being an artist and performer. It's a matter of knowing your own limitations. And a

matter of knowing when the technology is getting in the way. When I was writing for the record, I would go into the studio, turn on all the Mac stuff, and sometimes get completely distracted from writing because I was checking patches or worrying about a system crash. So I went out and bought a cheap micro-cassette recorder, and that's all I used to finally write the stuff for the record. This approach extended to making the record: I tended to rely on systems that were the simplest to use, like the Mackie and the D80, which is basically a self-contained recording and editing system. Those two systems were the unifying factors in the project."





## USA LOW-BUDGET RECORDS



Tony Sarno.

- ▶ studio are not a barrier to good-sounding productions, however. "It doesn't cost any more to record live drums in the kitchen than it does to use a drum machine," he notes. His production of Guardian's record 'Swing, Swang, Swung' was recorded at The Snack Bar in just this way, although the drums were overdubbed after acoustic guitars and a scratch vocal were first recorded to a click track. The personal studio simply accommodates itself, effectively though somewhat inelegantly — cables were simply strung across the Mackie console to the kit.

### INTO THE STUDIO

On the other hand, many artists feel they need the structured environment and access to more equipment and technical help that a studio offers. "I needed a real studio to do this record in," said

Tony Sarno, a blues/rock recording artist whose first record, 'It's A Blues Thing', was recorded for Memphis-based Icehouse Records on an initial budget of \$5,000 (though it actually ended up costing closer to \$10,000). "I could do the pre-production demos at home, and that helped keep the time spent in the studio down. But I wanted to work with a live band and I wanted us to all record together. So I needed a regular studio, one that sounded good but that could work within the budget."

'It's A Blues Thing' was recorded at Crosstown Recorders, also in Memphis. Studio owner/engineer Rusty McFarland, who has been a partner for the last five years in the 20-year-old facility, which has a Neve 8232 console and Sony analogue 24-track, said that artists producing low-budget recordings, but who also want traditional studio environments, are helping to reinvigorate business at the lower end of the commercial studio scale. After becoming increasingly aware of the limitations of home recording, "People are coming back to studios," he observes, noting a trend that started about four years ago. "And they're realising that there's something to be said for being in that kind of environment, where you have a separate control

"...artists producing low-budget recordings, but who also want traditional studio environments, are helping to reinvigorate business at the lower end of the commercial studio scale."

room and well-maintained gear. This is not a world-class facility, cosmetically or technologically speaking. But people can get a better sound, a more professional finished product, in a dedicated recording studio than they often can in a home studio. If the players are competent and the artist and producer are good, it's not hard to make it sound like a bigger-budget production."

McFarland, who engineers many of the records that come into Crosstown as part of the studio's hourly rate, says that budgets for blues, rock and alternative records coming into the studio are ▶

### BUDGET HOME RECORD CHECKLIST

1. Don't exceed your own capabilities — It may be on a budget but it needs to be good; don't hesitate to hire an engineer, especially for tracking and mixing, or other musicians, if you need them.
2. Don't buy, hire — don't deprive yourself of a good microphone or piece of outboard gear if you don't happen to own it. Check with hire companies, music/pro audio stores, or other home recordists. A great vocal mic can lift an entire project.
3. Consider using multiple studios. Your personal studio may be great, but another personal studio or a commercial one may have just the room for tracking or vocal overdubs. And a few hours outside the usual walls works wonders for the ears and attitude.
4. Set a schedule. Personal studios take a lot of the clock-watching pressures off, but that freedom can also lead to procrastination. Make up a recording schedule similar to one that you might have been on in a for-hire studio. When you go over the time budget, you'll really enjoy that freedom.
5. Hire an engineer. You may have become pretty adept at recording, but it does distract from the creative process. At least consider hiring an assistant to do the punches.
7. Don't forget mastering — and, preferably, don't think you can do it yourself with a DAT machine and stereo compressor. There are many small mastering houses that are affordable. And if it's truly not in the budget, bring in an experienced engineer to help master.
8. Have a good time!



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# FATAR STUDIO SERIES

MASTER KEYBOARDS



## USA LOW-BUDGET RECORDS



Rusty McFarland.

- ▶ averaging between \$5000 and \$10,000. Tracking and overdubs tend to move quickly, and he's brought mixing down to less than a week for a 10-track CD. He adds that records like these are especially profitable for studios with low operating overheads, who have their equipment, for the most part, paid off.

### MORE CREATIVE, MORE FUN, BETTER SOUNDING

Scot Merry, co-owner of County Q Recording in Nashville, says that the amount of independent alternative rock records is increasing, supplementing his already profitable base of country music demo sessions. "Country sessions involve pickers, which tends to keep the budgets up," he explains, noting budgets of between \$10,000 and \$15,000, mostly for 'vanity' country records that aren't signed to a record label. "Alternative stuff is based around bands and thus the budgets are lower by 25 to 50 percent, as opposed to solo artists. And they also tend to slave

"...traditional small studios can increase their percentage of the low-budget business out there by getting the hang of a genre."

off their tracks to ADATs and do their own overdubs and then come back to mix." But, says Merry, the budget levels of independent records is forming a transitional bridge between the home studio and the smaller traditional commercial facility, one that he sees broadening as more bands seek spaces large enough for them to track entire bands in. "They're also finding that their records are more creative, more fun and better sounding when they're in an environment in which they don't have to be the engineer and studio designer, too," he adds.

### GET TO KNOW THE GENRE

In Sanford, Florida, Bob Greenlee, president of both independent blues label Kingsnake Records and its eponymously-named studio, notes that the proliferation of independent labels has significantly increased the amount of non-in-house work that passes through his doors. "I wish the budgets were higher," he said. "But right now I can actually sell more records than I can make. I'll make \$5000 records all day long." Kingsnake's studio has a Sony JH-24 analogue multitrack, which Greenlee says indie acts find sonically preferable to the sound of digital recorders like ADAT and DA88. "The thing is, you have to convince some independent acts of that difference," he says. "I've been hearing more blues records that sound like they're made with a drum machine. That tells me that, even though more acts are coming [to small studios] to make low-budget records, a lot of them are also staying at home to make records." Greenlee also observes that traditional small studios can increase their percentage of the low-budget business out there by getting the hang of a genre. "Jazz and rock and roll work under the concept that progress is possible for their art form," he said. "In blues, in its post-modern form, you're not looking for perfection. It's no accident that blues is 12 bars. It's simple, below-the-neck kind of thinking. So the model for a modern small studio would be like it was at Muscle Shoals [Alabama, a major R&B center in the 1950s and '60s] years ago: to get to know the genre it thinks it can do best and get a stable of musicians and give independent blues artists something they can work with." Which is also to say, for musicians looking to get the most bang for their limited number of bucks, seek out studios that have some level of affinity for the type of music being done. That kind of connection will expedite the project and allow more of the budget to go into creativity instead of breaking down musical language barriers."

At Baby Monster Studios in Manhattan, owner/producer Steve Burgh is also seeing more very-low-budget record work, which he says helps fill in the gaps between major-label work. He's had to adjust his rates for these projects "to a certain degree," he acknowledges. "But I'd still like to see more of it. The [low-budget] projects tend to run two to four days, and that can fill in schedule holes between larger bookings very



nicely. I think most mid-sized studios will accommodate this level of budget. The thing is to present the project to the studio in a way that's attractive. Studios benefit from having records made in them — any kind of records. So try to make the studio owner part of the process and you'll find that budgets often have a way of being stretched in ways you might not have expected."

Another tangential factor that Burgh identifies is that his low-budget record rate generally includes a house engineer. "It would be great if this whole trend also caused the return of the concept of the staff engineer. That's something that I've always wanted to see happen anyway. In the case



**Mark Maynard.**

“...try to make the studio owner part of the process and you'll find that budgets often have a way of being stretched in ways you might not have expected.”

of these kinds of records, they want to get it done fast and make it sound good. So who knows the room and the equipment better than the engineer who works in the same studio every day?"

#### A&R VIEWPOINT

Mark Maynard, vice president of A&R at Icehouse Records, which is now distributed in the US by Priority Records, says that in choosing Crosstown or any of the other smaller studios he uses for the artists on his label, an accommodating rate and flexibility with scheduling is critical. "The way it

works is, I walk in and say, here's the budget, here's what I have to come out with, what can you do it for?" In the case of Sarno's record, McFarland's engineering was included in the studio rate on an as-available basis, which made the deal more financially attractive to Icehouse. On the other hand, he also acknowledges that in exchange for a favourable rate he needs to offer the studios volume. "If I walked in asking for that deal with one record, I know they might have a problem with that," he says. "But I'm willing to come in and say I've got four or five projects ready to go. That's what seals the deal."

Will small-budget records become the saviours of the 'middle class' studio? Rusty McFarland believes that they could, as long as the studios doing them understand the nature of this clientele and adapt themselves accordingly. "The middle-level studio has to carve out its own niche and specialise, and I think these kind of records are a way to do that. It still seems like there's more growth going into personal studios; they're still getting a lot of the indie record business. But people can hear the difference between a record made in a home and one made in a professional studio. If you can stay busy and hustle and keep your overhead low, you can make some money off this trend."

SOS

### BUDGET STUDIO RECORD CHECKLIST

1. Look for affinity: choose a studio that is familiar with the kind of music you're doing, be it techno, blues, or whatever. It'll make the entire project move faster and easier.
2. Don't be afraid to negotiate: while it's an unpleasant fact of life for them, smaller commercial studios are under tremendous pressure from home studios. As a result, you can almost always do better than card rate, and usually a whole lot better.
3. On the other hand, don't be a pig — smaller studios need to stay afloat, so be sympathetic to their circumstances when negotiating and remember that they need to make a profit, too. In the long run, fewer studios means fewer choices and higher rates.
4. Book on a day basis, not hourly — day rates are inevitably more cost-effective. Keep in mind, though, that a day is not the same length at all studios: at some it means 12 hours; at others, perhaps 15.
5. Look into a staff engineer. Many studios have staff assistants, many of whom are quite good and all of whom are quite eager to be first engineers. Their fee can be rolled into the studio charges. Ask them for examples of their work and spend some time with them. You may find a diamond in the rough and save yourself some money.
6. Don't buy your own tape — this is like going into a restaurant and asking them to cook your eggs. Let the studio have its tape markup; it's one of the few profit centres left to them. And don't ever use used tape!
7. No entourage. Friends and hangers-on might be fun, but they distract from the project, and when you're on a tight budget, time is definitely money.
8. Integrate personal recording equipment, anything from using a four-track to sketch out arrangements to bringing home rough stereo mixes to do your own overdubs.
9. Do your arguing off the meter. Creative differences are inevitable, but if you can, try to defer them until after the session. Why argue at 40 quid an hour when you can do that later over a pint?



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► on floppy disks, and Power Technology have already produced a large selection that covers everything from reverb to pitch shifting — see the ‘Power Tools: DSP-FX Plug-ins’ box for more details. Purchasers of the card are given free access to any single plug-in of their choice, with most users initially opting for the graphic reverb, and further effects can be purchased at a later date. One useful facility that is built into the system is a demonstration mode, where samples of any effect can be loaded and tested at any time. A ‘demo’ session typically allows the user a total of five minutes to hear how the plug-in sounds. All the available controls remain active throughout the session, although it is impossible to save new presets to disk, and the actual effect shuts down once every 25 seconds until a button is clicked to resume the test. Once finished, a demo session can be restarted at any time.

Thirty-two-bit processing is implemented throughout the system, and the card automatically compensates for low-level input signals to produce the highest sonic quality (see the ‘32-bit’ box for further details). MIDI control also comes as standard, with Power Technology recommending the JL Cooper MIDI controller to automate any parameter in real-time, with tactile control or sequencer automation. Other options include the AES converter, a 20-bit AD/DA system for high-

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- **FX Pack Modular System:** £TBA (system can be configured with up to four DSP-FX cards and PC interface cards).
- **24-bit AES/EBU-S/PDIF interface:** £316 (with interconnect cable).
- **AES/EBU-S/PDIF interface 4X:** £468.82 (with 4X expanded memory and interconnect cable).
- **DSP-FX AES/EBU converter:** £633.32 (stereo 20-bit A/D-D/A, includes AES and S/PDIF formats, and pro-level balanced I/O).

bandwidth master recordings, and the DSP-FX PowerPack — effectively a complete computer, packaged in a rackmount case with an audio card pre-configured.

## IN USE

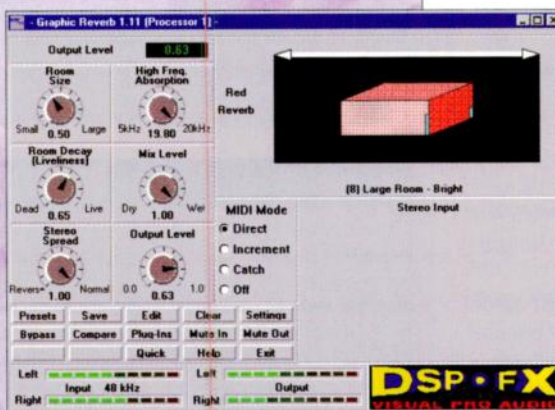
Installing the system was surprisingly simple. After I plugged the board into an available expansion slot and ran the setup routine, the hardware was immediately recognised and the program ran correctly. The benefit of having a graphical interface was immediately apparent, with delay times and panning positions represented on-screen by coloured circles, which vary in size, position and shade according to the effect settings. Editing the effect parameters is easily achieved, using either the mouse or via an external MIDI controller. Utilising the MIDI interface offers the added advantage of allowing current effect settings to be stored with sequence data, and there’s also the potential for automating the editing process. The program itself was quick to operate and simple to configure, and the various plug-ins are easily selected from an on-screen menu. The review system was tested on a Pentium-based PC, with 32Mb of memory.

Sonically, the DSP-FX is extremely impressive, especially if you’re able to take advantage of the digital interface. The 32-bit processing really does seem to make a difference, with all of the effects sounding clean and smooth. The reverb, in particular, is very realistic, with a depth and natural-sounding character that compares well with other systems costing many times the price. The graphical interface offers a much friendlier way of adjusting parameters, rather than the small LCD normally associated with processors of this type, and I found the control software easy and responsive to use. Even using the DSP-FX with the analogue input only, it performs well, providing perfectly adequate

## POWER TOOLS: DSP FX PLUG-INS

A wide variety of plug-ins is available for purchase or testing, and the best place to check them out is Power Technology’s web site (<http://www.dspfx.com>). The site is very comprehensive, with loads of data and detail on current products, as well as email addresses for technical support and further information. At the time of going to press, the following plug-ins were available:

- **GRAPHIC REVERB:** A full 32-bit reverberation algorithm, equipped with a number of room types, including Hall, Spring, Plate and Small Room. The graphical control is geared towards natural parameters, and offers adjustment of room size, liveliness (or decay-time diffusion), stereo spread, and high-frequency absorption. A red box is displayed to represent the room, with its shade of colour denoting absorption characteristics.
- **MULTI-ELEMENT CHORUS:** This plug-in offers control of four independent chorus elements, with each element displayed on-screen as a coloured oval shape. Delay time, modulation depth, frequency and pan can all be defined, as well as the overall signal gain.
- **FULL STEREO PITCH SHIFTER:** Two pitch channels are available, each of which can be assigned separate settings. Gain, shift-amount (in cents) and pan position are all adjustable, and graphically viewed as coloured circles on black background.



The Graphic Reverb plug-in.

- **ANALOGUE TAPE FLANGER:** As in the original method, where pressure was applied to the flange of a reel-to-reel tape recorder to vary the speed of one deck against another, this time it is the mouse that is used to adjust the effect. Depth, feedback, modulation frequency and gain are also available as programmable parameters.
- **MULTI-TAP DELAY:** Eight individually controlled channels, each with separate output level, feedback and delay. Once again, the multi-coloured display offers a unique insight into the current sonic configuration.



## 32-BIT PROCESSING

There are two main buzzwords associated with digital recording: 'bandwidth' and 'frequency'. If you're not familiar with these terms, imagine a comparison between digital recording and making a film. The audio 'frequency' is comparable with the number of frames per second that you can capture with a camera, and the 'bandwidth' is analogous to the depth of colour that you can capture on each

still picture. A dodgy black and white movie, which jumps from frame to frame, is analogous to an audio file which sounds dirty and unlike the original. The latest Spielberg epic is analogous to a high-bandwidth, high-frequency recording using the latest technology.

The DSP-FX utilises 32-bit internal signal-processing throughout, whereas most other systems stop at 24-bit.

Whilst in the pro world a 24-bit bandwidth has always been perfectly acceptable, and is certainly capable of producing extremely realistic effects, the sonic quality is ultimately limited by the signal level that is to be processed. If the input level is low, the available bandwidth will also be low and the process will suffer. With this in mind, the programming team at Power Technology have been working on the problem and appear to have developed a solution, evolving a system that

automatically adjusts the signal headroom to match the incoming signal level. This is a unique approach, which effectively normalises any incoming sounds, and compensates for changes in output level within the software — a very processor-intensive task. However, with the built-in power of an on-board DSP, and the capability of Power Technology's institute, timing problems appear to have been solved and the result is an extremely effective unit which sounds as good as the hype.

effects, but if you use the DSP-FX without the digital interface, you're really not making the most of the card. With the digital interface, the algorithms developed by Power Technology really come into their own, handling even the quietest of input signals.

### CONCLUSIONS

The DSP-FX is a well-thought-out product. The usual computer-based problems associated with crosstalk and signal degradation appear to have been cured, and the degree of visual control offered is exceptional. The method that Power Technology have adopted for graphically representing their plug-ins offers the user a quick and easy way to picture current settings, and effect editing is a simple process. The sonic quality is extremely high, especially when processing a

digital source, and certainly comparable to some of the more expensive alternatives from Lexicon and tc electronic. The reverb plug-in has a remarkable depth and clarity, is extremely realistic and really has to be heard to be believed. Even users unable to take advantage of the digital inputs will not be disappointed with the results obtainable with the DSP-FX. Highly recommended for any digital studio, and well worth a listen **SOS**

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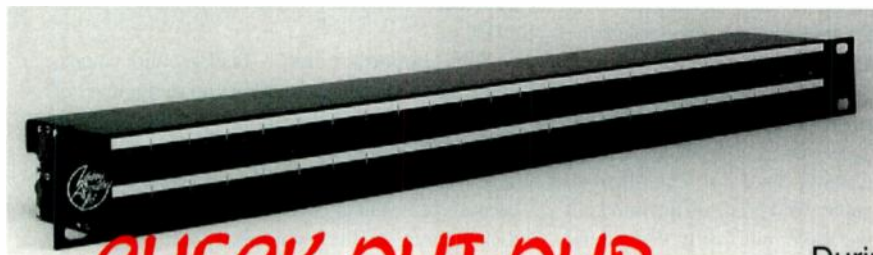
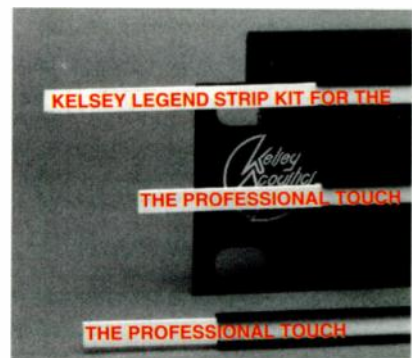
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# Special ApheX

MARVIN CAESAR • THE APHEX APPROACH TO COMPRESSION

*ApheX is celebrating 21 years in business, during which time the company has diversified from Aural Exciters into signal processing such as compression. However, ApheX President Marvin Caesar feels that the subject of compression is still widely misunderstood. PAUL WHITE asked him to set the record straight.*



ApheX first rose to fame with their legendary Aural Exciter, first commercially marketed back in 1975, but since then, the company has diversified into signal processors, many of which handle some aspect of dynamics control. In a market crowded with 'me-too' compressors and gates, I asked ApheX President Marvin Caesar how the company went about designing products that would stand out from the crowd.

"Our philosophy is that we should make unique products — and that came from my laziness, because I didn't want to have to compete with anybody! I didn't want to sell on price or just the odd feature, I wanted to make something that was a little bit better. The problem is that as the market has expanded downwards, there are fewer people who really know what they're listening for, and as a result, our equipment has to be explained to more and more people. And that gets me into gain reduction — most people don't fully understand what a compressor is supposed to do."

**Was compression the first area you went into after the Aural Exciter?**

"Yes. Most compressors are effects — the attitude is that if you put something through a compressor, you get a certain sound. When tuned properly, compressors can produce a very pleasant effect as you hear the artifacts of the gain control. Our philosophy is: fine, we'll give you the tools to do that, but the real trick of gain reduction is to be

able to do it without introducing any effects other than level correction. In that regard, we've succeeded marvellously, first with the Compellor for average level control, then with the Dominator for peak level control. Our Easyrider has an intelligent compressor that is easy to use, but achieving that goal has confused a lot of people. A lot of people listen to our processor and say 'Why do I need this? I can't hear it working'."

**This might be a good point to talk about the situations in which you might want an invisible gain control rather than compression as an effect.**

"One important area is background vocals, which have a tendency to come up to the level of the lead vocalist or disappear. In a mix session, you can ride the faders to keep them 'in the pocket', but a good compressor will do a better job because you want to have them sit in a very narrow dynamic range. But you don't want it to sound in any way processed, you just want it to sit.

"Another example is where you have a music bed that you're trying to lay into a video, where the music is quite dynamic, but you want to keep it underneath the dialogue. Again, you need a transparent compressor, otherwise you hear the tonality changing as the compressor operates. Good compressors are also important in broadcast and PA, where you have to get above the noise floor, but you can't exceed a maximum level. ►





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“To make a compressor sound extreme, apply 10db of gain reduction in manual, hard-knee mode, with a high ratio.”

► Certainly, in terms of reducing the dynamic range of a 24-bit digital programme down to VHS cassette, with its restricted dynamic range, requires a very transparent compressor.”

So your aim has been to allow the user to apply as large a reduction in dynamic range as possible without the subjective sound of the material being affected. Perhaps this is a good time to look at how you do this, because on the face of it, all you have to play with are threshold ratios, attack times and release times.

“Before you even get to the intelligence of the side chain, you have to look at the signal path. Our philosophy has been that every processor must be able to do nothing before it does something — which means that it has to be absolutely transparent when you put it in line. The quality of the audio must not be changed by the fact that you’re putting it through the processor. This requires a good choice of integrated circuits, and a good choice of input and output stages that interface transparently with anything you might want to plug into.”

This is a problem area with many balanced units, because when you plug them into an unbalanced insert point, you lose 6dB of level.

But of course the whole purpose of a VCA is that you apply a control voltage to change the gain, and one weak area is the change in DC offset that occurs as you exercise the VCA. You hear that as clicks or pops in a noise gate; in a limiter you would hear it as the limiter working harder than it needs to, because the DC component at the output is being fed into the detector circuit. When there’s no DC on the output — or no control voltage feed-through, as some people call it — the processing is a lot more accurate. And of course the quality of the audio passing through is extremely good.

“The first test you should do on any compressor is to do a hard bypass and listen carefully to the sound to see if it changes in any way from passing through the processor. A kick drum or something with a very hard leading edge is probably the most revealing — look for a loss of that leading edge, a smearing of the high end or woolliness, and a loss of bass presence. Even though the device may measure perfectly flat, there may be something dynamic that’s going on causing a loss of bass presence.

“Why is our circuit better? In the Expressor, we have a fully manual compressor, where you can adjust the release and ratio — all the parameters



“What we use is servo-balanced inputs, as well as servo-balanced outputs. The idea is that when you ground one leg of an output, you get the full signal swing on the other leg so you don’t lose any level, and a lot of modern equipment works this way, but the problem with most of these circuits is that the grounded output stresses the output amplifier, and you’re pumping current onto the ground. Our outputs work so that when one leg is grounded, you get the full voltage swing on the other leg, but we turn off the grounded leg.

“The real difference is that we use our own 1001 VCA. Many VCAs sound and perform quite well when they’re not being exercised, meaning that there’s no changing control voltage on them.

you find on a compressor — and indeed, you could adjust the parameters for each type of input you might ever look at, and if you’re really good, you could adjust those parameters in real time, so that as the texture of the track changes, the compressor action changes with it. Of course, that’s impossible in practice. There has to be some intelligence that allows the processor to constantly fine-tune its own performance.”

### ASPECTS OF COMPRESSION

“When setting up a compressor, what you hear is that the higher the ratio, the faster the attack, and sometimes the release, the more the effect on the audio quality. If you try to achieve a better sound by slowing up the attack, and lightening up on the ratio, then you have the probability that the level will overshoot. Because of this, you have to further lower the threshold, which means now you’re doing more processing, or you have to speed up the attack time, which still means more processing. What you want to achieve is the impression of a slow attack, because what we very often listen to are the leading edges of a signal. These relate to intelligibility — you recognise the consonants and interpolate the vowels — even if you don’t hear vowels, you can still have intelligibility.”

Are you saying that a slow attack and slow release will produce the most natural sound, but then the compressor doesn’t get a chance to do its job properly? If I was presented with this problem, I’d hazard a guess that what you

### PRACTICAL TESTS

“To make a compressor sound extreme, apply 10dB of gain reduction in manual, hard-knee mode, with a high ratio. Speed up the attack time and use a fast release time — what you should hear on a full mix is a loss of transients, and the bass modulating the mix so that it sounds distorted.

“Next, slow up the release time. You should hear some of the distortion go away, but the loudness will reduce.

“The other experiment is to reduce the attack time, and you’ll hear the transients come back up as you turn the knob. If you have peak-reading meters on the equipment following the

compressor, you should also notice the peak levels coming up dramatically as the shorter transients pass through the compressor unchecked.

“Another thing to try is reducing the ratio, and here you’ll notice a lot less spectral gain modulation — the bright sounds won’t be so badly affected by what’s going on at the bass end. By doing these experiments, you’ll get a feel for what the controls actually do. For example, if you have higher ratios and very slow attack and release times, then you have levelling. And with a digital recorder, it may be beneficial to have some kind of leveller followed by a processor that limits the peak level of the signal — such as the Dominator.



# FOLIO SX

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► **need is a dual-stage processor, where a slow attack and release compressor is teamed with some kind of fast-acting limiter to take care of the overshoots.**

“That would depend on what type of processor you’re talking about. There are different approaches that we use, depending on the application, and one of the ideas is that it’s always better to run the signal through as few stages as possible, because no processing always sounds more natural than processing. There are so-called compressor/limiters, and most compressor/limiters operate so that at the onset of gain reduction they’re compressors, and as you get deeper into gain reduction, the ratio increases towards limiting. Soft-knee type compressors fall into this category. Then there are other devices, where you have separate compressor and limiter sections, and they can work effectively,

mix was clipped, but because the bass track was clipped before mixing. If you then put clipping on the peak excursion of the complete mix, it can make it sound worse.

“The idea is to know what you’re trying to do to the signal: do you want to bring low level signals up, do you want to keep low level signals down, do you want to change the sound by deliberately introducing pumping and breathing — which can be quite musical — or do you want to both control level and introduce pumping and breathing?”

**Virtually anyone can build a compressor that will pump and breathe, so what’s the secret to making one that is as transparent as possible?**

“Understanding the physics of sound waves and psychoacoustics. For example, an application of psychoacoustics is exploiting the fact that the



but the two sections must communicate with each other, otherwise you can run into trouble, depending on the texture of the input.”

**The other type I’m familiar with is the variable-ratio compressor, where above around a 10:1 ratio, you can say that the compressor becomes a limiter. However, unless you have a very fast attack time, some transients will still get through before the compressor has time to react, so these can’t be true limiters.**

“Exactly. And one of the problems is using the right process for the application. You can use clipping, which is fast, infinite-ratio limiting, but clipping is different from gain reduction. With gain reduction, the entire waveform is squeezed, whereas with clipping, you’re taking the top off the waveform. Because of this, a gain-reduction device is bound to sound less loud than a device that uses clipping.”

**Of course, the instinctive reaction is to say that you can’t use clipping, because clipping is a particularly nasty and audible form of distortion.**

“Clipping is audible if it is allowed to exceed a certain duration, and that duration is decreased if the clipping is repeated. The first clip can be a little bit longer, and then the subsequent clips need to be shorter, but when done properly, clipping does sound better, because it’s actually less damaging to the sound and you don’t lose the impact of the leading edge.”

**You must be talking about clipping of such short duration as to be inaudible. Is this in the region of 1ms or so?**

“Actually, the first clip can be a little longer than that — you can get away with up to around 5ms first time around. However, if you look at a lot of mixes, you can see that the bass waveforms are flat-topped, and that’s not because the whole

human hearing system can’t detect very short periods of clipping. Another example is in the Easyrider, where different attack times allow the initial change above threshold to go through with a slow attack, then if it exceeds a certain level, it engages a faster attack, but because the initial part of the transient went through on a slow attack, the impression is that the whole signal was treated with a slow attack. The result is a cleaner sound quality than if you use a second device to handle the peaks.”

## APPLICATIONS

**Perhaps we should look at where we should use compressors and where we should use limiters, because inexperienced engineers seem to interchange the two terms.**

“If you use a manual compressor, when you set a high ratio and fast time constants, you’ll hear that they have a major effect on the audio — loss of transients, loss of high end, the kick drum making the vocalist ‘duck’ [not physically, but in the sense of reducing the level of the vocal during kick drum hits — Ed], and so on. We call this spectral gain intermodulation. Once you’ve tried this and understood it for yourself, then you’ll understand that if you want to bring low signals up, you have to set a low threshold. But if you have a low threshold, an awful lot of your signal is going to be above threshold, so whatever happens to that signal needs to be fairly gentle in terms of ratio and attack and release characteristics.

“If, on the other hand, I want to keep high-level signals down, to do that effectively I have to have a fast attack time and a high ratio. As already stated, that has the maximum effect on the sound, so I don’t want to put my entire signal above that threshold — the threshold must be set higher. Understanding what you want to do is critical in terms of where that

“Our philosophy was that we should make unique products, because I didn’t want to have to compete with anyone!”



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“If you look at a product like the Compellor, there are three separate brains that are always adjusting the attack and release. They’re always analysing the relative density of the input signal. One of the biggest applications of the Compellor is for cable TV. Everyone has experienced how the commercials wake you up at night because they’re so much louder than the programme, but you’ll find that both the commercials and the programme have exactly the same peak output level. It’s the average level that’s different because the commercials are already heavily processed. The Compellor reads that and pulls up the release time on heavily-processed signal and speeds it up on unprocessed signal. It does that totally automatically, so the segues between the two are much smoother.”

**On the other hand, you can sell people processors that will enable them to create very loud-sounding commercials.**

“That’s the Dominator, and in terms of perceived loudness, it’s interesting to note that if a sine wave produces 100% loudness, a square wave of the same peak level will register 158%. Now electronics respond to peak levels, especially digital equipment, and if you flat-top a waveform, it’s clearly going to be louder than reducing the gain.”

**It’s all down to area under the waveform, and the maximum possible area is produced by a square wave.**

“That’s right, and here’s something that’s very interesting. Take a waveform with a high transient peak: if this is reduced using gain reduction, the whole waveform would be pushed down in level, even though the peak might be very short in duration. What’s more, if the release time is long enough, whatever follows will also be reduced in gain.

“If, instead, we clip the brief transient, the rest of the waveform isn’t subjected to gain reduction, so the perceived result is much louder. And because the clipping is very short in duration, it’s completely inaudible. Intelligent clipping is why the Dominator makes things sound so loud. The specific invention within the Dominator is the automatic limit threshold, where we monitor how long the signal has been in clip, and if it’s been in clip too long, we reduce the threshold of the band limiters underneath the clipper. Nobody else does this — it’s our patented process. We can set the threshold right at the maximum level for the following device, for example, to use all the bits in a digital recorder or to get to 100% modulation in a broadcast transmitter.

“Once you go into the digital domain, there’s no way you can buy more resolution. You can cover garbage up with noise, but you can’t get more resolution. Even with a 24-bit system, you

want to use up all your bits to keep as far away from the noise floor as possible. Also, there’s a lot of data compression used in broadcast and storage, so to ensure that these have minimum impact on the audio quality, it’s once again essential that you record at the maximum resolution possible. What’s more, it helps if you can reduce the signal entropy — by entropy we mean anything unusual that’s making the bit-rate reduction system work harder. For example, if you can reduce transients before you go into a data compression system, the system is much better able to deal with it — the effects of data compression will be more benign.

“Using the Dominator is fairly benign unless you limit too deeply, and in my experience, the first 3-6dB of limiting is free — you can’t hear it. In fact, the Dominator is the limiter of choice for use with professional in-ear monitoring systems.”

### SPLIT BAND

**Do you have any views on the benefits or otherwise of split-band compression, where different sections of the audio spectrum are compressed separately?**

“When you’re doing a wide-band compressor, everything is being reduced, which is why the intelligent side-chain control is needed to minimise it. The problem is that if you have something dominant in one part of the spectrum, it will tend to affect everything else.

“With split-band devices, the effect you hear most is at high ratios — which is more like limiting — and with limiting, the threshold should be set high. Split-band limiters make a lot of sense, but what some people do in broadcast is to use split-band compression, which essentially re-equalises every song. If you don’t want to change the EQ, wide-band compression and levelling is better, if it’s done properly, whereas the purpose of multi-band compression is to change the EQ.

“Our only current multi-band unit is the Dominator limiter, which has three bands, but our next FM processor will be a multi-band compressor, simply because the radio market demands a very loud, thick signal. There are lots of programme directors out there who think they know better how to mix a record than the artist or the producer, and that’s an unfortunate situation, but I have some recommendations to producers on how to package audio so that broadcast processors do not do as much damage as they do to unpackaged audio.”

**Turning now to the possibility of digital dynamic controllers, is there any advantage to having a digital processor that can look a few samples ahead, so that it can anticipate what’s coming next?**

“Not really. In theory, it’s always helpful to see what’s coming, but given the attack and release characteristics of a good compressor, it’s better for the side-chain to look at the output than it is the input. And if you look at the output, it already happened. As far as I can tell, the existing technology is as good or better sounding than anything that can be done digitally.”

SO

#### HARD OR SOFT KNEE?

“The idea of a hard knee is that sometimes you want to hear the effect of the sound going over threshold — a sudden ‘grab’. Soft knee allows a much smoother transition into the compression, but at the same time, you’re doing a lot more processing before the ratio that you’ve set. In fact, what we do in the Expressor is to lower the threshold by 10dB, so you get approximately the same output when you switch from soft knee to hard knee.”



# The process of elimination.

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Pictured above is the latest plug-in from Waves - TrueVerb - not just a state of the art reverb, but designed to simulate the actual sound of a good room. Adjust reverb time, room size, frequency response and even the distance of the sound from the listener.

Also new from Waves -

Waves version 2.1 plug-ins are already 100% compatible with PCI based Digidesign systems. Version 2 also provides 'component' versions of the plug-ins for more efficient use of the available DSP and to allow more than one simultaneous process per DSP chip within both the Pro Tools TDM and SDII environments - a feature unique to Waves.

A new upgrade for WaveConvert (Macintosh/PowerMac 1.6, Windows 1.2) is now available. New features for the Macintosh include: audio conversion from within Quicktime, pre-processing for Real Audio encoding, custom Creator ID's, improved dithering, preservation of all regions, markers and loops in conversion (SDII, AIFF), and more. New features for Windows include: AIFF support, unlimited number of files, quantisation noise gate, arbitrary sample conversion rates, special dither for speech files, improved file naming conventions, Maximiser and audio quality. WaveConvert was used to prepare Real Audio files for the Metallica website ([www.metalclub.com](http://www.metalclub.com)) and by the band Nine Inch Nails for converting all the music and sound for the new video game Quake (the successor to Doom from ID software)

Waves' Audiotrack and L1 Ultramaximiser plug-ins are now available for Sonic Soudry's Sound Forge 3.0.

Coming soon-

PS22 Stereomaker - a dramatic stereo-from-mono plug-in for TDM, SDII and Powermac.



WaveConvert for Windows & Macintosh is an easy to use audio processing application for multimedia developers. It combines the well known peak limiting technology of the Waves L1 Ultramaximiser with other Waves processors into a powerful one step audio processor. Wave Convert easily converts Mac or Windows based high resolution audio files into lower resolution audio files while retaining optimal sound quality.

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The C1 is a true frequency-selective dynamic processor with phase compensation. That simply means you could compress only the bass without colouring the sound. Or you could limit only the treble, and so forth. The C1 is an expert tool; there is no other dynamic processor like it in the world. Ideal for mastering, voice-over, or even frequency-selective keying, the C1 is supported by an extensive Setup Library.

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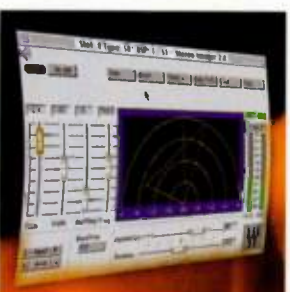
L1 Ultramaximizer is the worlds best known digital peak limiter. The L1 features IDR processing-a better dithering/noise-shaping system than others costing nearly 20 times the price. Ideal for mastering Compact Disc and multimedia audio as loud as the major labels and publishers. The L1 is industry standard for CD and multimedia mastering. Our users include Microsoft, Steve Miller, Sony, Sega, Nintendo, korg and Tangerine Dream.

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The Q10 ParaGraphic EQ is one of the most powerful equalizers ever made, with 10 band stereo parametric EQ, whether for subtle or extreme adjustments. A 200-piece Setup Library provides pre-emphasis, pseudostereo, multimedia, mastering and many more pro-audio tools. The graphic interface has been called "the model for audio software interface design". The Graphical and numerical control, and the display are unmatched.

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*Though Tascam have embraced the digital generation of Portastudios with their MiniDisc-based 564, they're not about to abandon the low-cost analogue cassette format yet, as proved by their latest analogue machine, the 414.*

**DEREK JOHNSON**  
*gets it taped.*

The recording world may be inexorably turning digital, but there's one market sector that has yet to be addressed digitally: the entry level. It's going to be quite some time before stand-alone digital multitracks of any flavour will hit the sub-£350 price band — although the recent trend in MiniDisc-based multitracks is tantalisingly close! But for now, analogue cassette-based machines offer the most cost-effective start in the world of multitrack, and not only is the hardware affordable and easy to understand, but the recording media is cheap and widely available too.

This brings us to Tascam's recently-launched 414 Portastudio. A replacement for the Porta 07 (apparently one of Tascam's best-selling Portastudios), the 414 falls nicely in the middle of Tascam's current 4-track cassette range: the truly entry level Porta 03 MkII retails for £199, the 424 MkII costs £499, and the 414 is a comfortable £349. Note the convenient £150 price banding!

### FACILITIES

In common with the Porta 07 (reviewed in June 1993's *SOS*), the 414 offers a combination of a simple 4-input mixer section and double-speed (9.5cm/second) tape transport (using dbx noise reduction), housed in a light, compact casing. In

fact, as I write, the Portastudio is perched on top of my Atari ST, with just a few inches hanging off the back. This limited size doesn't necessarily mean a restriction of facilities, though, as we'll see.

Physically, the 414 has taken on some of the look of the more up-market 424 MkII (reviewed in September 1996), replacing the Porta 07's colourful 'teddy bear eye' knobs with a collection of more traditional-looking controls. There are operational improvements as well: the 414 can record on all four tracks at once (unlike the 07, which was restricted to two), and it features two sets of stereo inputs with level controls, in addition to the four main inputs, and two dedicated effects sends.

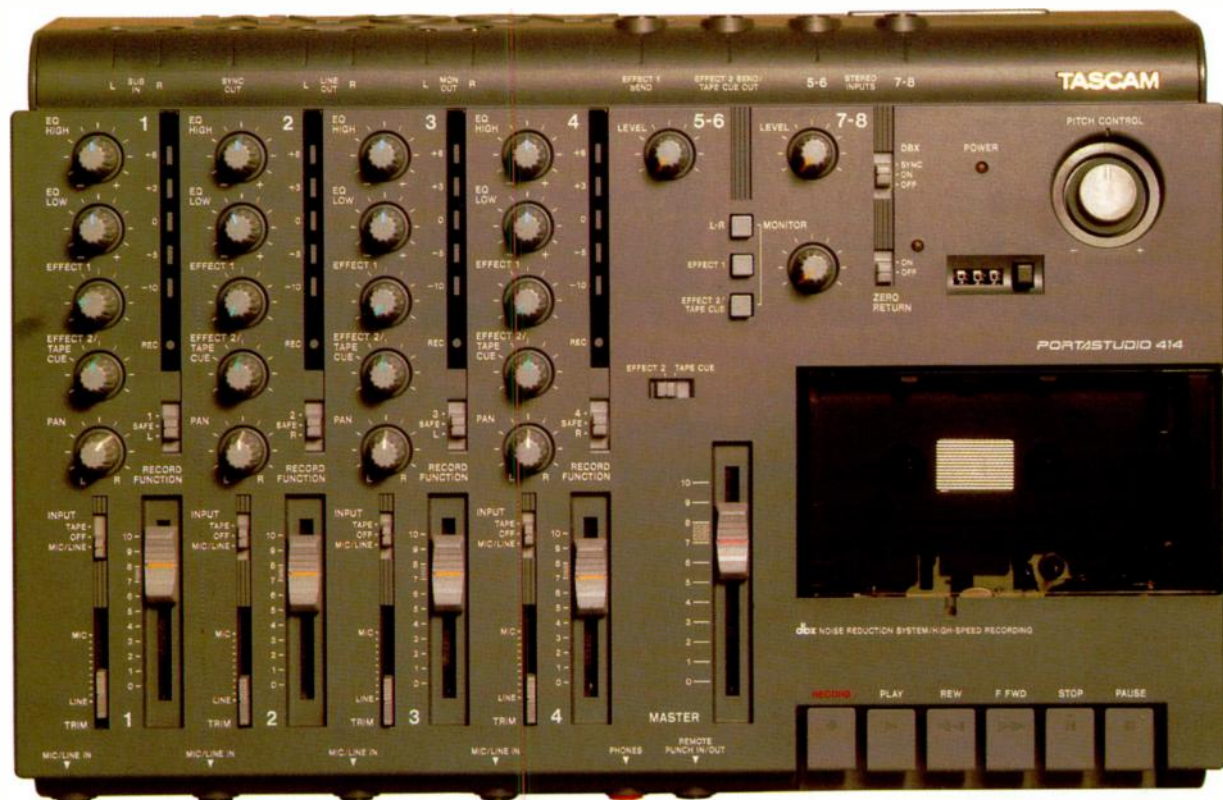
The 414's cassette transport is fairly basic, and uses mechanical controls rather than the soft-touch buttons found on the likes of the 424 MkII; the tape counter is also mechanical, rather than digital. Though there are no sophisticated transport or locate functions, there is at least a 'return to zero' switch, and a pitch control varies the play speed by +/-12%. On the noise reduction front, dbx can be switched in or out, and a special sync position switches it off just for tape track 4, so that a sync code (for locking MIDI sequencers to tape) can be reliably recorded.

The mixer section is simply and logically laid out. There are four input channels, each of which features, from the bottom:

- A quarter-inch input jack, which can accommodate mic or line sources.
- A trim pot, for setting the overall input gain, between -10dB and -50dB (mic and line level).
- A main level fader.
- An input source select switch; your choices are off, tape and mic/line.
- A Pan pot, for placing your signal in the stereo field.
- A record routing switch — options are safe (ie. no recording), a tape track numbered

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## TASCAM 414 PORTASTUDIO





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# TASCAM 414

## pros & cons

### TASCAM 414 £349

#### pros

- Records on all four tracks at once.
- Two effects sends.
- Three sets of stereo inputs — two with level controls.
- Tape sync facility.

#### cons

- No individual tape outs.
- Single-speed transport.
- No insert points.
- No dedicated metering for stereo output.

#### summary

The 414 is almost the most affordable way to get into multitrack recording; its price-to-features ratio also makes it one of the best value cassette multitracker options. Buy cheaper and you may not be as happy with the results.

**SOUND ON SOUND**

## FEATURES

- Double-speed tape mechanism, optimised for Chrome tape.
- dbx noise reduction.
- Records up to four tracks at once.
- +/-12% pitch control.
- Tape sync capability on track 4.
- 4:1 Tape Cue mixer.
- 4-input mixer, plus two stereo inputs and stereo submix input, equals 10 inputs on mixdown.
- Two effects sends.
- 2-band EQ.
- Separate main mix and monitor outputs, for independent monitoring of stereo mix at mixdown.

- ▶ 1-4 for the equivalent input channel, and a left or right input (left for channels 1 and 3, right for channels 2 and 4) for stereo recording.
- Effect send 2/Tape Cue: depending on the setting of the Effect 2/Tape Cue switch (found above the master fader), this forms part of a basic 4:1 monitor mixer (independent of the main mixer), or can be used as a second post-fade effects (auxiliary) send.
- Effect send 1, for connection to an effects processor.
- EQ Low, shelving at 100Hz, with 10dB cut or boost.
- EQ High, shelving at 10kHz, with 10dB cut or boost.
- An LED bargraph meter, which provides a readout of the playback or record level of each track.
- A record-ready LED: this flashes in record standby mode, and lights fully when recording is actually taking place.

As mentioned above, the 414's mixer section also features two stereo inputs, labelled 5-6 and 7-8. These are strangely equipped with stereo jack sockets, rather than a pair of mono jacks each, so you'll need to use a stereo splitter cable or insert lead in reverse in order to connect stereo devices to these inputs. And that's still not it for inputs: a pair of phono sockets provides a stereo submix input; just like the Porta 07, this has no level control and is routed directly to the master fader. Stereo inputs 5-6 and 7-8 could be used as effects returns, or to patch in the output of an external mixer. Add up the mixer inputs, plus the stereo and submix inputs, and you get 10 inputs altogether — not too bad for a budget Portastudio!

On the output front, there are two auxiliary send jacks, and a collection of phono sockets offering a main stereo line output (which would be patched into your mastering recorder), a monitor output (for connection, independently of the main stereo output, to a stereo monitoring system) and a synchronisation output; there is no dedicated sync input, since the right-hand socket of the submix input doubles up for this function. The headphone socket can be found at the front of the 414, next to the Punch In/Out footswitch socket. The remaining switches and knobs offer control over the monitor mix, which is independent of the main stereo mix; you can monitor the main mix, effect send 1 or Effect 2/Tape Cue (once again, this latter function is selected with a dedicated switch).

## 414 IN USE

Making a recording with the 414 is as straightforward as it gets. To record, plug an instrument or a mic into one mixer channel. Switch the record function switch to the channel's track number (say, 1) and put the input selector switch to the mic/line position. Play your part a few times, while checking the level going to tape: 0dB is ideal, but peaks of up to +6dB are fine. Ideally, you want the signal to be as 'hot' as possible without distorting. You may have to alter the trim control to

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## BOUNCING & SYNCING

When bouncing down, a technique used to stretch the limits of the 4-track format, the 414's stereo buss, in common with other cassette-based multitrackers, is used in a particular way. Say you've recorded three tracks — one of drum machine, one of bass synth, one of guitar, for example — and you still want to add some synth and vocals. The classic way is to make a mono bounce of the drums, bass and guitar tracks. To do this, set track 4's record function switch to record on the Right buss, and pan the three backing tracks hard right. Play it back, balance the tracks until you're happy with the mix, and then go into record. If all is well, you now have your basic backing on one track, and have freed up three tracks for new material. Of course, you could also play another part while recording the bounce, which makes the technique even more flexible. You lose some control later (ie. the basic track cannot be re-balanced, and it's not in stereo), but the overall result is a more sophisticated arrangement.

Users with a MIDI-based system can stretch the 414 even further, since recording a sync code onto track 4 (any kind of synchroniser can be used — Smart FSK or SMPTE) will allow a MIDI sequencer (or drum machine) to play along in time with any audio recorded onto the other three tracks. Arrangements as complicated as your sequencer and MIDI gear will allow can be created, with the audio tracks left for non-MIDI audio sources such as guitars or vocals. One side-effect of this is that MIDI-generated tracks will always be first-generation recordings when preparing your final stereo mix, since they won't have been recorded or bounced onto the Portastudio first.

▶ get the cleanest signal, especially if you're using a mic. The EQ can, of course, also be tweaked while recording. Now, press the pause button, then the record button. When you're ready, release the pause button to start recording. To play back, set the input switch to the Tape position — this will now route the signal coming off tape through the mixer channel — and the record function switch to Safe. To hear the recording through headphones, press the L-R monitor switch.

It's also possible to make recordings via the stereo buss. Mixer channels 1 and 3 are routed to the left side of the stereo mix, while 2 and 4 are routed to the right side. This technique allows you to record entire stereo mixes within the 414, and to bounce previously-recorded tracks (see 'Bouncing & Syncing' box for more on bouncing). In the first case, setting either tracks 1-2 or 3-4 to the left and right mix buss lets you record a stereo mix of all the signals coming in via the main mixer, plus the two stereo inputs 5-6 and 7-8, and the submix input. So if you were playing live with a friend or two, or had a band playing through an external mixer, patched into the submix input, a stereo backing track could easily be recorded in this manner — complete with effects, if you patched them into the stereo inputs. One thing to watch out for is that when using the L/R buss to record, anything that is playing through the mixer will be recorded onto the new track or tracks, so if you don't want previously-recorded material to be bounced with your new recording, it'll have to be monitored via the tape cue system, with the main fader turned down. This way, you'll hear the original track on your headphones (or monitoring system), but it won't actually be going through the mixer.

One commonly-required recording function is 'punching in' — re-recording over just a section of a take that is otherwise OK. Plugging a footswitch into the Punch In/Out socket lets you do this hands-free. With the 414, the technique is to set the track on which you'd like to punch in to 'record ready', start playing before the area to be re-recorded, and press the footswitch just before the correct point. The selected track goes into record, and pressing the footswitch again takes the 414 out of record. As usual, it'll take practice to find the ideal place to punch in — choose your punch-in point carefully or you'll get a click (most people will tell you to punch in on a drum hit to disguise punch-in artifacts — which is all very well, unless you're not using drums!).

Metering may be a little confusing for some. Although there are only four meters — one for each input strip — they do behave differently in different circumstances. First of all, they register the level of an input signal being recorded, depending on the position of the input fader (and the master fader when recording in stereo or bouncing). On playback, with the Record Function buttons set to Safe, the meters show the level coming back off tape, and while wiggling controls might make an audible difference, it doesn't affect the level shown by the meters. Switch a pair of channels' record function buttons to left and right, and the chosen pair of meters registers the level of

the overall stereo mix; with this switch set to the direct channel input, the meters show the level coming back off tape, which will respond to fader movements. In these latter two cases, make sure you don't have a punch-in switch connected, since accidentally hitting the switch will start recording on any enabled tracks.

## VERDICT

In short, the 414 can be used in exactly the same way as many a cassette multitracker before it. Sonically, it is capable of excellent results, within the limits of the cassette format. Noise, courtesy of the dbx, is kept at a minimum, and one or two bounces are possible before distortion and unwanted side-effects become obtrusive. The other high point of this (and virtually any other) cassette multitracker is immediacy: being limited to four tracks and a small mixer means you start working within the format, and that almost always leads to faster sessions; it also inspires compromises, which occasionally result in a finished mix that wouldn't have occurred when using a more comprehensive mixer/multitrack system.

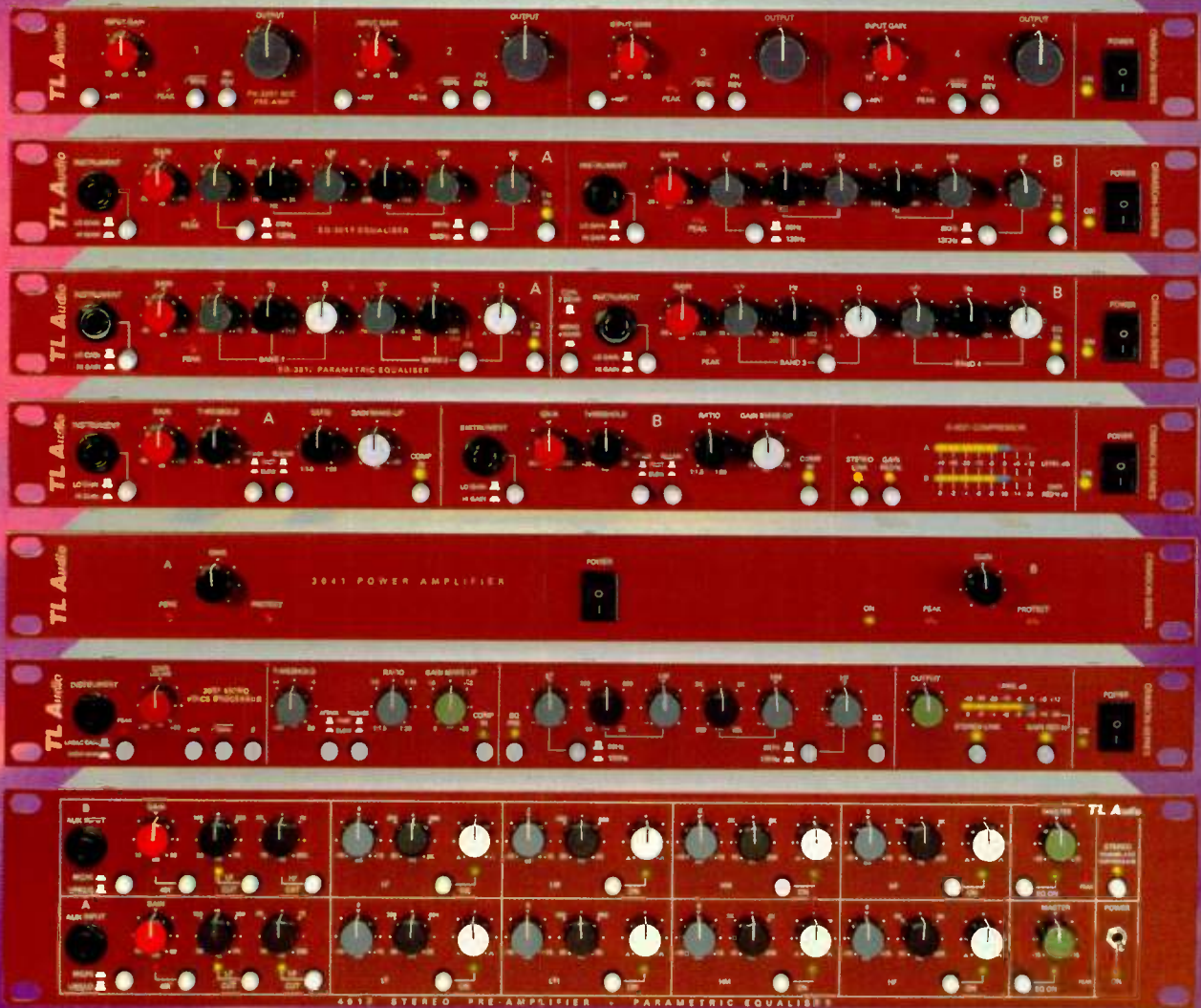
The 414's shortcomings are few, given its price and target market. Most notable is a lack of separate track outputs, which would have allowed an external mixer to be used to treat your multitrack audio. The high-speed-only transport could also be seen as a bit of a limitation. Many cassette multitrackers give you the option of working at normal cassette speed (4.8cm/second); this has the dual advantage of allowing normal cassettes to be played back on the multitracker, and of enabling the terminally insolvent to squeeze even more out of their cassettes, since they run for twice as long (though you'll never get the best quality results working in this way). It would be inappropriate (churlish, even) to comment on the 414's lack of XLR mic inputs and three-band EQ, although one or two insert points would have been nice (on the main stereo outputs, for example).

For ease of use, immediacy and sheer fun, it's hard to beat cassette-based multitrackers, and Tascam — who were, after all, the inventors of the format — are particularly good at building these machines. On a value for money basis, the 414 is the same price as the Porta 07 when it came out nearly three years ago, yet it shows a significant advance in features. If you're looking for a painless and affordable introduction to basic recording and would like a bit more than the rather limited Porta 03, or you simply want a well-specified multitrack notepad, the 414 should be near the top of your list. **SOS**

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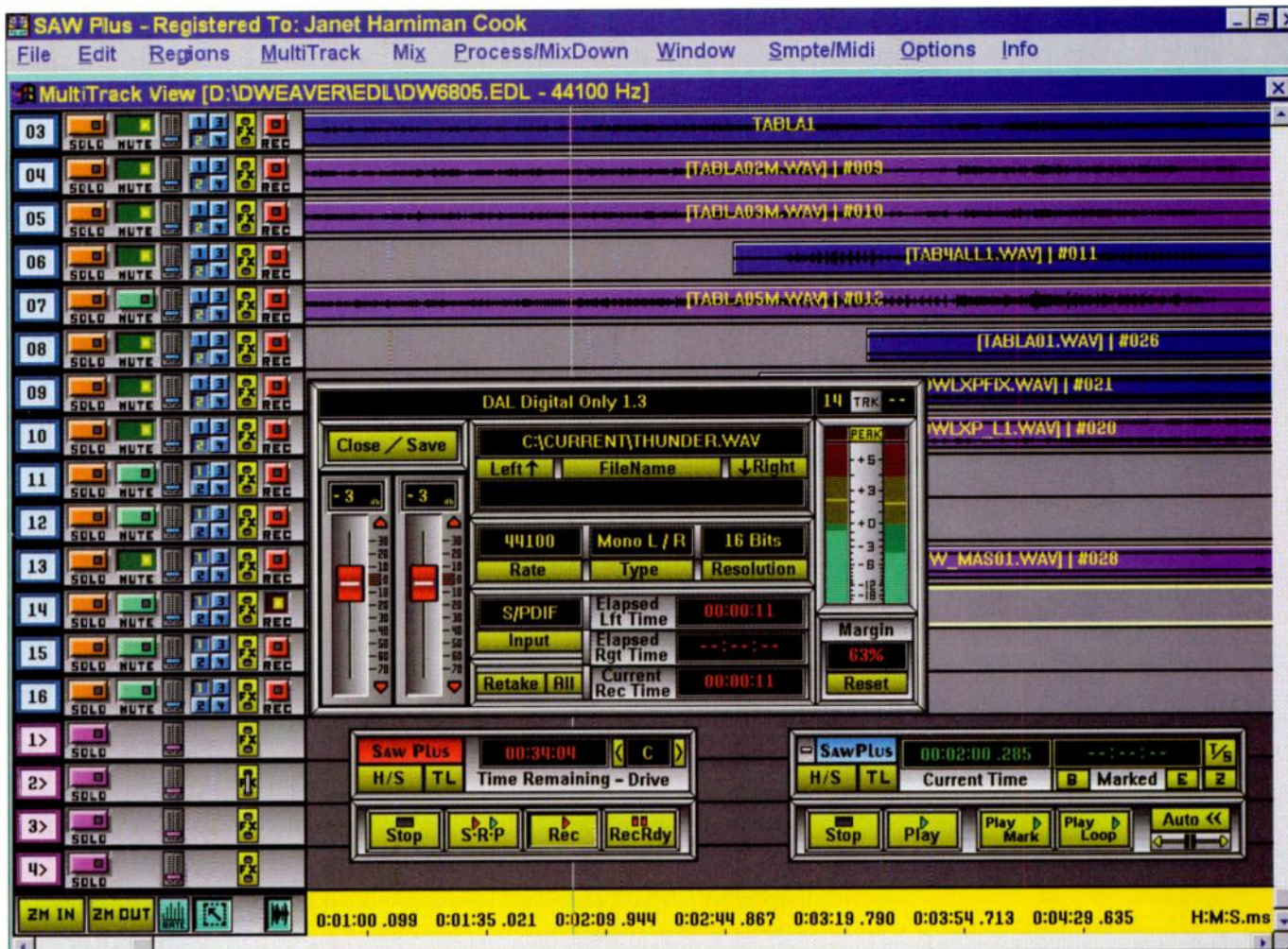
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Multitrack View.

# plus

IQS SAW PLUS 3.3 MULTITRACK RECORDING/EDITING SOFTWARE & IQS PLUG-INS FOR THE PC

*Rather than trying to be a jack of all trades, SAW Plus has made itself a master of one — providing a dedicated multitrack recording and editing environment for digital audio on the PC. JANET HARNIMAN-COOK came, saw, and wrote this review...*

The PC is fast becoming a viable alternative for studio-quality MIDI and hard disk audio recording. Today's powerful PCs provide a dazzling range of music recording tools for songwriting and album production, as well as soundtrack, multimedia, remix and radio program creation. The last year has seen the launch of many top-quality Wave editors and MIDI + Audio sequencers, and though MIDI + Audio software represents a wonderful achievement, in my experience the multitrack editing and recording environment found in many of these applications can be disappointing. Enter SAW Plus 3.3. This dedicated digital audio multitracker from

# points

Innovative Quality Software uses extremely clever 32-bit assembly language programming to emulate hardware DSP functions. SAW Plus is a seriously powerful application, and to fully exploit its potential, you need a well-equipped, big Pentium. But don't despair — the reference PC used for this review is a modest Pentium 100, and this produces very impressive results.



## OVERVIEW

*SAW Plus* 3.3 comes with comprehensive Windows on-line help and a spiral-bound printed manual. Although both are very useful, neither has a comprehensive index. The program's keyboard commands, although well-considered, do not follow Windows standard conventions, though in practice this does not prove much of a problem, as *SAW Plus* is highly intuitive throughout, and easy to learn and use.

*SAW Plus* can simultaneously play back an awesome 32 tracks of digital audio, if your computer is fast enough. The program supports up to four stereo 16-bit Windows soundcards, to potentially give eight channels in and out. Unfortunately, PC system resources are finite; they will almost certainly not provide the individual Interrupt (IRQ), memory area and address port settings required by four cards, and soundcards providing two discrete stereo channels on a single set of PC system resources are not expected before autumn 1997. With patience, however, three cards may be persuaded to operate in tandem. *SAW Plus* will run on a single 16-bit soundcard, but you will be limited to stereo in/out.

For this review, two cards (Turtle Beach's Multisound Classic and Multisound Pinnacle with digital daughter board) were used, to give four analogue channels in and out (2 x stereo) and one stereo digital I/O. Fortunately, even with one soundcard, you can run as many internal tracks as your PC can handle. *SAW Plus* will perform real-time, on-the-fly wavefile format conversion, and play back a sequence of wavefile data regardless of format. One region could be mono 8-bit at 32khz, the next 16-bit stereo at 44.1khz, and so on. Each track has solo, mute, level, pan, effects patching, and soundcard input/output routing. Tracks contain sequences of audio defined as Regions; a Region can be of any duration, from the whole sound file to a fraction of a second, and is simply a set of play start and end times that refers to a particular wavefile. Editing the Region simply changes play times and is not destructive of the audio.

## INSTALLATION

Installation is straightforward. *SAW Plus* is one of those rare applications that do not scatter system files all over your hard drive, and this makes de-installing it painless. Configure your soundcards in the Options Menu/Audio Hardware Setup,

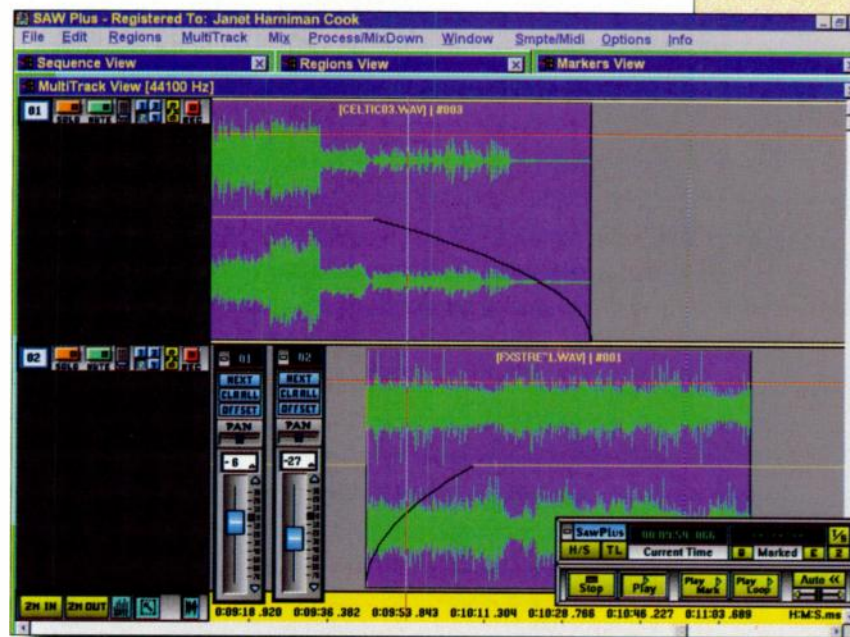
assigning Interrupt Hooks (IRQ) to 'None' — the Windows 95 default setting. Finally, install plug-ins (such as the AVI viewer module and the Reverb — more on this later). Like Emagic's Logic, *SAW Plus* can save up to 12 different workspaces, or screensets, which are stored and recalled from the keyboard function keys. Whenever you want to see your workspace from a different perspective, you recall the appropriate screenset. You can also customise the colours of screen objects used by *SAW Plus*, and define your own default colour scheme in Options/Colours.

## MULTITRACK VIEW

Most activity in *SAW Plus* takes place in the Multitrack view. To the left are the Track Controls, with the Tracks themselves stretching horizontally across the screen. Regions (which can be named) are depicted as rectangular blocks in the Track, and can display the waveform, if you like. The ability to view the waveform in the Multitrack view is significant, as it makes lining up audio events on different tracks a doddle.

One of the reasons I find *SAW Plus* so good to work with is its superb graphics handling. Screen redraws are near instantaneous, magnification functions are assigned keyboard shortcuts, and tracks may be repositioned in the list by simply clicking on the track number and dragging it to a new position. To solo or mute a track, click on the track control button; the speed with which the solo or mute is implemented depends on the Preload buffer queue setting found in the Options/Audio Hardware Setup. Fewer buffers gives a faster response, but may cause slower systems to hiccup when starting playback.

Between the lowest visible track and the scrollbar ►



## pros & cons

### IQS SAW PLUS

#### pros

- Very fast and powerful.
- Stunning multi-card playback
- Stable and reliable.
- Real-time effects processing
- Very easy to use and good to work with.
- Fine-sounding reverb plug-in.

#### cons

- Non-standard Windows keyboard commands.
- No track names.
- Needs a big Pentium to realise its full potential.
- Rather expensive (though see sidebar for special *SOS* reader offer), but no comparable equivalent available.

#### summary

*SAW Plus* is the finest PC software multitracker/assembler on the market.

**SOUND ON SOUND**

## CROSSFADING

To create a crossfade, overlap the songs on adjacent Tracks. Select the top track and position the cursor at the point where you would like the point of equal volume level to occur.

To guarantee a smooth transition, choose 'Crossfade (-6dB) Marked or Overlapped to Next Track' from the Mix menu. *SAW Plus* implements the crossfade with surprising speed, and the results are impressive.

Automated crossfade between adjacent tracks, with virtual moving faders.



# IQS SAW PLUS

“Installation is straightforward. *SAW Plus* is one of those rare applications that do not scatter system files all over your hard drive.”

Sample-accurate editing in the Soundfile View.



► is the Time Line, where time information is displayed in clock time or as samples. The Time Line is used for navigation — clicking on it locates the cursor. The current position is defined by the location of the cursor, which is the vertical line that scrolls horizontally across the track area during playback and record. Its position is displayed numerically as the current time in the Remote Transport window, where we also find play, stop and locator buttons.

The lowest four tracks in the multitrack view are numbered 1-4 and have pink buttons. These are the output tracks, used as global controllers for solo, volume, pan and effects patching for each soundcard.

## RECORDING

Recording in the SAW Plus Multitrack view is simple once you get the hang of it.

- Click to select the track to which you want to record.
- Select the desired soundcard by clicking on the appropriate square blue number button in the Track Controls. Whenever possible, use digital transfer if you have a digital source, such as a DAT machine, and a digital audio card in the PC.
- Click the red track Record button. The record dialogue box appears.
- Select the record mode: stereo, mono (L/R), or split stereo (L+R).
- Choose sample and bit rates.
- Click 'File Name' to label the new file and define its location on your hard drive.
- Next, test input levels by clicking 'Rec Ready' in the Record Transport box. The bargraph meters should dance responsively in the presence of incoming audio. If necessary, adjust the record input level using the red sliders.
- Position the cursor to define the record start

point by dragging on the Time Line.

- Go to the Record Transport box, and click on 'Rec' to start recording. If you want to record and play back with other tracks, you need to click Shift + SRP (Synchronized Record & Playback). The Record Panel and the Record Transport bar displays indicate time remaining on disk, peak level and elapsed record time.

## AUDITIONING

When compiling recordings for larger projects like albums and soundtracks, one of the most difficult things to do is ensure consistent volume levels.

Without fancy compressors and limiters, I have found that it is difficult to avoid level discrepancies. But with a non-linear system like *SAW Plus*, these are easier to spot. As there is no rewind time, playback begins almost immediately and you can quickly compare start volumes by auditioning in the Regions view (right-click on the entry in the Regions list).

- When the recording is complete, click on 'Stop'. *SAW Plus* automatically creates a new region and adds it to the Regions list. The new region is placed in the track at the record start cursor position and appears as an entry in the Sequence window. You can also record directly to the Soundfile view, should you prefer to.

Clicking on 'Auto' on the Transport bar before recording relocates the cursor to the record start position when recording is stopped — extremely useful when recording multiple takes. You can quickly go from one take to the next by muting the previous take and clicking on the record button to open the record dialogue for the next track. Even if your PC cannot play all the recorded tracks at once, you can still have audio on muted

tracks, auditioning multiple takes on different tracks by using the track mute buttons.

If you want to record along with your take, set playback level and pan values by clicking on the track fader icons and adjusting the slider that appears. If you hold down the Control key when clicking a track fader icon, all 16 track faders are opened. The faders are stacked on top of each other, and selecting a track makes the corresponding fader rise to the top. Overall level and pan offset values may be set by clicking on the fader offset button and adjusting the offset sliders.

## WAVE EDITING

The Soundfile view is where you'll find wavefile editing. You can zoom in closer to a waveform (zooming is fast and works for both time and amplitude), mark start and end points of an edit area, select the whole file for editing, update existing



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# IQS SAW PLUS

► regions and create new ones, and move regions into tracks. Regions may be split, cleared or pasted to new or existing sound files. Pasting regions will allow you to remove unused audio from the start and end of the soundfile (top and tail), and you can then copy the usable audio to a new, shorter soundfile, to help help free disk space.

DC Offset (DCO) functions are found in the Edit menu. DCO is a type of electrical disturbance, caused by mismatches between digital audio recording devices, and commonly encountered in soundcards and DAT recorders. When viewed at high magnification, audio files affected by DCO exhibit a wave image that is off-centre of the zero-level axis. DCO may also cause audible clicks and pops at splice points. To correct DCO problems in *SAW Plus*, zoom in and mark a quiet part of the soundfile. If DCO is present, go to Edit/Calibrate DC Offset, which produces a DCO correction template. Mark the whole soundfile and select Edit/Apply DC Offset to remove.

## MULTITRACK ASSEMBLY

As well as being a great multitrack recorder, *SAW Plus* excels as an assembler. The assembler is where you add the finishing touches to your

“Used in conjunction with *SAW*'s Snap to Cursor function, Markers provide a simple and powerful means of navigation and Region positioning.”

recordings and build your project — anything from constructing a single musical piece, such as a song or backing track, to compiling a collection of recordings for your album or soundtrack.

In addition to recording audio directly into *SAW Plus*, you can load wavefiles from your hard drive. To grab files from CD, you must first copy them to your hard drive, as direct CD file transfer is too

## BACKUP & RESTORE SESSION TO DAT

When archived the EDL and associated soundfiles that comprise your current session are backed up in a form that allows subsequent restoration. For a large multitrack production, archiving will take longer than the total length of the individual tracks, and restoration will take roughly the same time. This is characteristic of all DAT backup from hard disk recorders, including *SAW Plus*.

## SYSTEM REQUIREMENTS

*SAW Plus* runs under Windows 95 and Windows 3.1x. IQS claim better performance in Windows 3.1; this, in my experience, applies to systems with less than 20Mb of RAM. Minimum PC requirements are a Pentium 90 with 16Mb RAM, large fast SCSI or EIDE (mode 4) hard drive, video resolution 1024 x 768 x 256 colours.

Reference System: Windows 95 running on a Pentium 100 with 256k pipeline cache, 32Mb RAM, 2Mb 64-bit PCI video card, 2.3Gb hard disk, 17-inch monitor, Turtle Beach Multisound Classic soundcard (stereo analogue I/O) and Turtle Beach Multisound Pinnacle (stereo analogue and stereo digital I/O, with optional digital daughterboard fitted).

slow. Session information, including region definitions, sequence lists and mix changes, is saved as an Edit Decision List file (EDL), and it's advisable to save your EDL after every major edit move.

## POSITIONING & MARKERS

The Regions view list is arranged alphabetically, and you can audition a region by clicking on its name and then right-clicking to toggle playback. Placing a Region onto the Track is done by shift-clicking on its entry in the list and dragging, and multiple entries may be selected and moved or edited as a group. Region start and end points can be edited directly in the Multitrack view.

Used in conjunction with *SAW*'s Snap to Cursor function (backspace key), Markers provide a simple and powerful means of navigation and Region positioning. Markers may be placed in the Multitrack or Soundfile views and are displayed as a list in the Markers view. When you click on a Marker, the cursor snaps to its position. You can add Markers during playback and recording, and they can be moved to the current cursor position by clicking on 'Update' in the Markers view. They can also be renamed. Unfortunately, there is no option to make Markers visible — I would prefer to see them as vertical flags, especially as *SAW Plus* has no provision for creating song section labels. (I got around this by recording a minute-long mono section of audio, called 'labels.wav'. From this, I created Regions with a different name and length for each song section. These were arranged in sequence on a muted Track.)

## MIXING & MIXDOWN

*SAW Plus* has impressive mix functions. You can switch mutes and solos during playback and preview *SAW Plus* effects (see box). Real-time volume and pan changes are automatically recorded, which makes *SAW Plus* great for level and stereo image (pan) rebalancing during mastering. Pan and level can be viewed graphically: click on the track's slider in the Track Control panel, and the Region display in the



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# IQS SAW PLUS

## SPECIAL SOS READERS' OFFER

IQS, an American company, recently decided to begin direct-marketing their products. The retail price of *SAW Plus* is \$999, but IQS have made a very special offer to *Sound On Sound* readers. Mention that you have read this review when you order, and you will be sent *SAW Plus* for \$499 — less than half price!

Plug-Ins: AVI Viewer & Meter Bridge, \$199 each; Reverberator \$299 (call or fax IQS for info on special introductory offers).

*AVI Viewer: subframe-accurate lockup between multitrack audio and picture via internal SMPTE generator*

- ▶ Multitrack view changes colour and sports two extra horizontal lines. The top line represents Pan and the lower Volume. Level changes are reflected in the height of the lines.

Real-time mix edits do not alter the original soundfile data. However, multiple tracks running pan and volume changes with real-time effects processing place a heavy burden on the CPU. Playback may stop and the dreaded warning message, 'This Machine Is Not Fast Enough to Keep Up With This Much MultiTrk Processing In Real Time' may be displayed. To avoid this, when satisfied with levels, go to 'Build Mix To New Soundfile' in the Process/Mixdown menu. The original audio data modified by volume, pan and effects settings, is recorded into a new Soundfile. Add this to a new Track.

### EFFECTS & PLUG-INS

When you click on the yellow 'FX' icon in the Track Control panel, the Effects Patch Builder is displayed. The window to the left contains Effects Choices, which are effect patches and plug-ins. The Patch Builder follows the current track selection, and patches may be placed pre- or post-fader. Patches can be chained and assigned either to individual tracks or output tracks; when they're assigned to an output track, the entire output to that soundcard is effected.

Effects/processes that ship as standard with *SAW Plus* include:

- Reverse audio
- Vari-pitch/speed (but not timestretch)
- Reverse phase
- Centre channel eliminator
- 7-band parametric equaliser (featuring 18db/octave high- and low-cut filters with definable cutoff frequencies)

- Stereo echo/delay
- Compressor/limiter/gate/normaliser

These are of a uniformly high quality, and with a fast PC you can audition the effects in real time; user settings can be saved.

IQS also manufacture three optional plug-ins:

- The AVI Viewer enables you to run AVI animation files. These use the *SAW Plus* internal SMPTE generator to deliver subframe-accurate lock-up between multitrack audio and picture.

*“The Reverberator is fine sounding and stylishly presented. Top marks to IQS on this one!”*

It is thrilling to see music and picture running together so effortlessly, and with the right video capture card you can also display and scrub full-screen video to an external monitor.

- The Meter Bridge module displays output levels via switchable LED bargraph or emulated moving-coil VU meters. Both feature peak hold and percentage readout.
- The Reverberator is fine sounding and stylishly presented. Top marks to IQS on this one! In addition to 30 factory presets, you can

edit and save your own settings. There's plenty of scope for experimentation, with a massive 20 comb filters, and 20 full-band filters with HF diffusion control for each comb filter feedback path. Additionally the wet output has a steep cut-off filter.

To edit or run in real time, the Reverberator needs a Pentium 133. On my Pentium 100, playing back at 44.1kHz with a Multitrack Preload Buffer set to 20, I was able to get a 13-second preview on my Pentium 100 before the warning that my machine was too slow appeared. This was, fortunately, sufficient time to assess the effect. After processing a 100% wet version of my audio to a new track, I adjusted the levels of the wet and dry tracks, and the result sounded great. The reverb textures were uniformly natural sounding and presented a quality at least on a par with budget rack units.







The IQS Reverberator plug-in sounds great, but for full real-time preview you need a Pentium 133.


## TIMECODE

SAW Plus generates SMPTE timecode internally. Using an Opcode MQX32m MIDI/SMPTE card in the PC, SAW Plus can generate MTC and SMPTE code and may be used for controlling VTRs and ADAT digital multitracks. The program will also chase timecode arriving at the MQX32 input. If you are using the MQX32 for SMPTE, the Windows drivers should not be installed. This is because SAW Plus manages the card at board level. You can hook up SAW Plus to synchronise MIDI sequencers, but if you have a MIDI + Audio sequencer, you may find that using SAW Plus for specialist audio tasks is a better option. As all your audio is WAV, it can be more productive to pass work between applications. I have found that trying to run, for example, 12 tracks of audio and 20 of MIDI on MIDI + Audio packages invariably causes PC overload!

## CONCLUSION

SAW Plus 3.3 is a remarkable product. I've been using it, under Windows 95, for nine months, and I've found it superior in the studio to both ADAT or stand-alone HD systems. In fact, SAW Plus 3.3 is the most user-friendly multitrack recorder I've ever used. In track-laying sessions it is a delight to run, and when mastering it's great for on-the-fly level and stereo image rebalancing. It's also amongst the most stable and reliable pieces of software I've encountered.

In my opinion, SAW Plus is the value for money PC software solution for multitrack

assembly work, and should prove invaluable in a wide range of studio environments. Using the program in conjunction with a dedicated wave editor such as Steinberg's WaveLab and/or Sonic Foundry's Sound Forge 4 provides the kind of comprehensive, top-quality digital audio editing power that was the stuff of dreams only a few years back. Complement this with your favorite MIDI + Audio sequencer — Cubase, Logic or Cakewalk — add a CDR and a CD mastering package like Hohner Midia's Red Roaster, and you have a professional-quality virtual studio on your PC, capable of undertaking each stage of the production chain, from recording the first notes of the first track through to mastering the finished CD. Magic! 

Many thanks to Mark Balogh and Colin Budgeon at Et Cetera Distribution.

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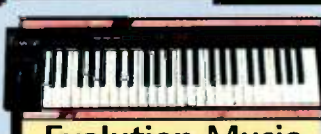


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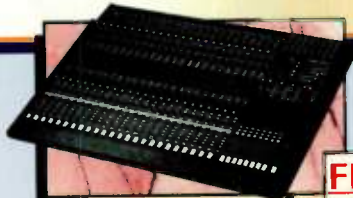
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- 2 band EQ

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- 2 band EQ
- 2 band EQ
- 2 band EQ

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- 12 level patch
- 2 band EQ on all channels
- 2 band EQ
- 2 band EQ
- 2 band EQ

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- 12 level patch
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- 2 band EQ
- 2 band EQ
- 2 band EQ

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- 2 band EQ
- 2 band EQ
- 2 band EQ

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- 2 band EQ
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Studiomaster bestmaster 16:2	£ 399	Ch
Seck 12:8:2	£ 195	Ch
Alesis 16:22	£ 149	Ch
Soundcraft Spirit Line 12:4:2	£ 199	Ch
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Samui MX12	£ 249	Ch
Dynasys Series3 16:2	£ 199	Ch
Peavey Unity 1080 8ch	£ 219	C

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Roland D20	£ 299	C	Korg M1	£ 599	C
Roland DX50	£ 899	Ch	Yamaha DX7	£ 299	Ch
Yamaha DX27	£ 199	Ch	Roland D50	£ 499	Ch
Korg DW8000	£ 299	C	Korg Wavestation	£ 599	Ch
Korg Poly 800	£ 149	Ch	Casio CZ3000	£ 149	Ch

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Roland MT100	£ 149	Ch	Roland J110	£ 199	Ch
Roland S330	£ 449	Ch	Alai S1000PB	£ 599	B
Kawai K4r	£ 299	B	Emu Performance	£ 199	Ch
Roland MV51	£ 319	Ch	Yamaha MU5	£ 149	B
Yamaha MU500	£ 229	B	Roland SC55	£ 299	C
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Alai S950 (1.5meg)	£ 699	Ch			

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Alesis Monitor 1 (pair)	£ 199	B	Fostex R8 (8 track)	£ 699	Ch
Fostex R8 (8 track)	£ 699	B	Tascam 234	£ 249	Ch
Alesis ADAT/BRC	£ 1999	C	Aphex Type C	£ 99	Ch
TQA MRBT (8 track cassette)	£ 499	Ch	Aphex Type C	£ 99	Ch
Tascam Porta 2	£ 249	Ch	Yamaha MT120	£ 249	C
Alesis Datadisk	£ 199	Ch			

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- phantom power
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# Drive

## CHOOSING PC DISK DRIVES AND CONTROLLERS

If you are thinking of replacing your current PC hard drive, or indeed adding an extra drive, two factors will immediately spring to mind — speed and size. Before we get on to the specifications which determine overall performance, let us firstly address the size issue.

### SIZE MATTERS

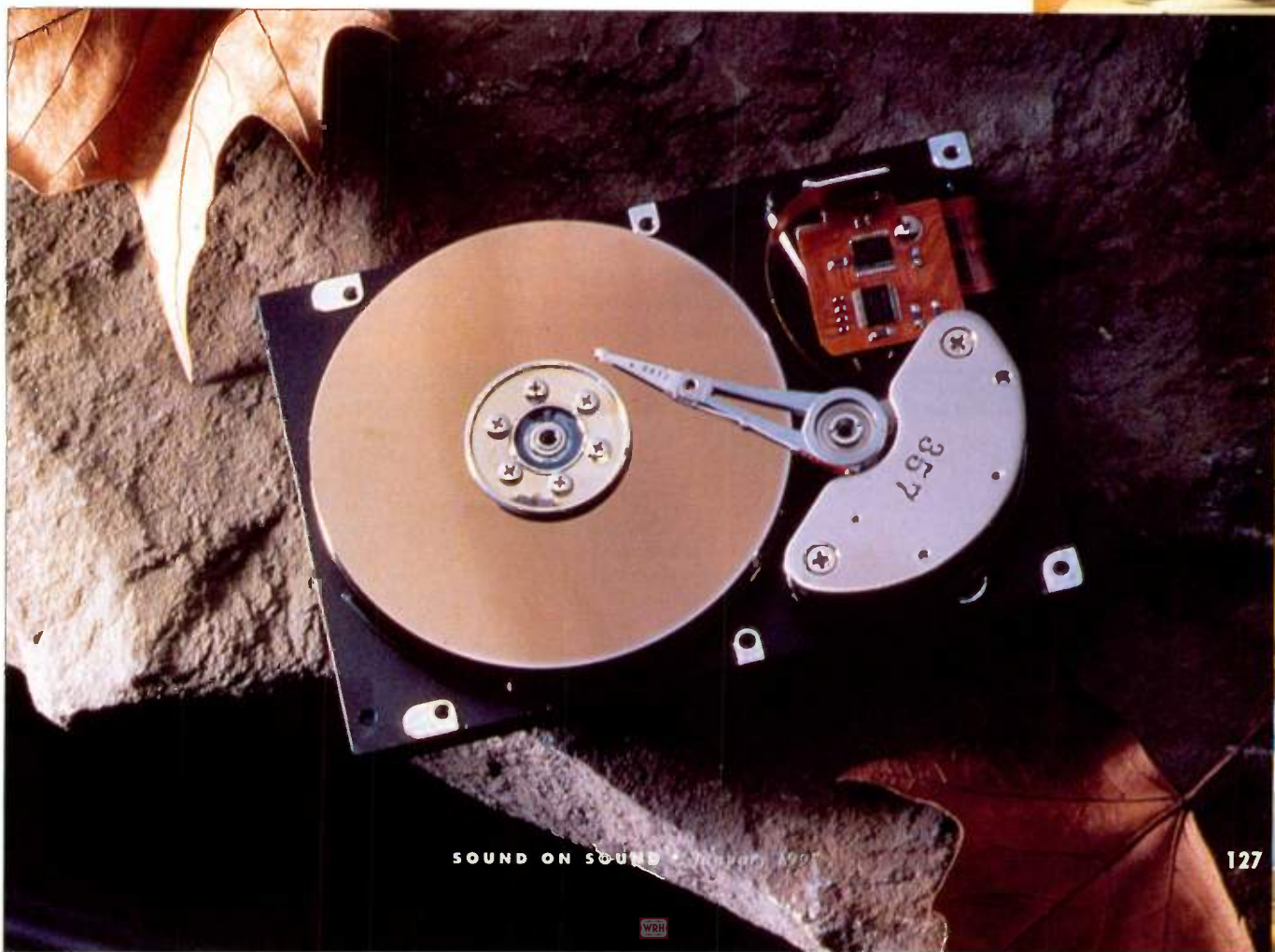
Most modern multimedia PCs will come with a 1Gb hard disk (with 850Mb being the absolute minimum currently supplied). Even if you are careful in deleting unwanted applications, demos, and memory-hogging games from your PC, you are still likely to fill at least half of this gigabyte with the Windows 95 operating system, normal everyday applications and data. If you only intend to fly in occasional tracks to accompany MIDI data with an all-in-one MIDI + Audio sequencer, this should be fine. However, if you are thinking of hard disk recording, then at 5Mb per minute for a single mono track of 44.1kHz digital audio, the remaining 500Mb will only allow 12.5 minutes of 4-track recording. Even for basic mastering of a CD album in stereo, you will need at least

# time

*PART 1: If you have to decide what to delete on your PC before installing a new program, it's time to consider a bigger disk drive. In the first of this two-part series, MARTIN WALKER explains why size isn't all you have to consider when making your choice...*

600Mb for the final result, and to leave any space at all for editing, 1Gb of space is more sensible.

If you want to run the equivalent of an 8-track system (such as ADAT), each mono track recorded at 44.1kHz will occupy about 300Mb for an album lasting an hour. So, for an hour of 8-track ▶





# Choosing PC disk drives & controllers

- ▶ recording (where all eight tracks are on the go simultaneously) you would need a drive of 2.4Gb capacity. In more typical situations, when the eight tracks are not all full, you would probably get away with 2Gb. However, skimping on hard disk size is very much a false economy, especially with drive prices falling all the time. The last thing you want to be thinking about when adding the final track to your latest masterpiece is whether you dare delete a few unused takes that you think you won't need again, just to create enough room for the final touches.

significant portion of the workload from the main computer processor when recording and playing back large amounts of audio data. If you need more than a single stereo output to allow separate outboard EQ and processing for each audio track, whilst it is possible to set up two or more soundcards simultaneously in the same PC, this route can be fraught with problems (see my feature on this in last month's *SOS*). At this level of performance, you should seriously consider a purpose-designed system, such as Digidesign's Session 8 or Audiomedia III.

## DRIVE PERFORMANCE

When choosing the hard disk drive itself, two main factors need to be taken into account — sustained transfer rate and access time. Transfer rate is a measure of how fast the drive can read and write data, but commonly this is quoted in 'burst' mode. Many typical computer applications have a lot of disk activity in a short space of time followed by a lot of computation (for example, graphics packages and word processing). By incorporating memory caches in the disk assembly, short-term performance can be greatly increased when many small files need to be read or written. One typical use of hard drives by musicians is for hard disk recording, where many reads and writes are carried out using much larger total amounts of data over long continuous periods of time. In this case, onboard caches are less useful, and the manufacturer's 'Sustained Transfer Rate' will give a much better idea of overall performance. For typical applications, a figure of 1Mb/second is a good target to aim for, but the faster the better! 'Access Time' is the time taken by the drive to locate where a particular piece of data is stored. With hard disk recording, the data for up to eight tracks needs to be accessed before your software mixes everything down to a single stereo pair for output through a soundcard, which means that the drive read heads will be shooting off all over the place — so it is important to look for a low access time. Again 'Average Access Time' is the figure to look for, and although 18ms is good enough, if you want to scale the heights of multitrack audio performance, 10ms is more appropriate.

“When choosing the hard disk drive itself, two main factors need to be taken into account — sustained transfer rate and access time.”

Many people's impressions of hard disk recording on a PC are somewhat blurred, due to the wide range of choices available, from simple systems using a low-cost soundcard (which will provide two to four tracks), to high-end alternatives that offer multiples of eight tracks with dedicated hardware in external cases. As a rough rule of thumb, if you intend to use any more than four tracks, you would be well advised to look at one of the intelligent soundcards, such as the Turtle Beach Tahiti, which provides enough processing on the soundcard itself to remove a

## NEAT AND TIDY — DEFRAGMENTATION AND COMPRESSION

Although this has been mentioned on many occasions in *SOS*, it is well worth repeating. During everyday use of any hard drive, many files will be created and then deleted. The operating system will save files in the first empty space it finds on the hard disk, and if the file size exceeds this space, it will find another empty space and continue saving. With drives that have been in use for some months, a single file may end up split into many separate sections scattered throughout the disk, and the larger the file, the more likely it is to end up in this state. Writing a file under these conditions will obviously take a longer time, due to the additional overhead of jumping between the individual sections, whilst reading the file will have the same performance penalty. When you

defragment the hard disk, using for instance the disk defragmenter utility supplied with Windows 95, the entire disk is simply scanned and everything shuffled so that each file ends up in one neat packet. In hard disk recording systems with four tracks or more, defragmenting can produce a considerable reduction in the time it takes to replay tracks, so regular defragmentation is a must if you intend to get the most out of your system.

Many people use *DriveSpace*, the disk compression software supplied with Windows. This simply acts like a separate drive with a capacity larger than its actual size, and works by compressing all files in a similar way to programs like *PKZIP*. With the large increases in hard disk sizes coupled with price drops, this

technique is probably not needed quite as much as it was several years ago, but increases in drive capacity at no extra cost will always seem desirable. The disadvantage is that compression and decompression take a finite time, so your data transfer rate will drop slightly. Despite its popularity, some people are still suspicious of trusting their data to manipulation of this sort, and prefer instead to zip up particular files as and when needed, rather than commit themselves to anything more general. Whatever your personal preference, there is a performance penalty, since compressing files before saving and expanding them again when reloading will certainly take a finite amount of time. For backup purposes using removable drives, this is not a problem, but for high-performance audio, never use a compressed drive unless you are prepared to accept a reduced transfer rate.







# Choosing PC disk drives & controllers

## ▶ AV DRIVES FOR MUSICIANS

When choosing a hard drive, one other thing needs to be taken into account in addition to sustained transfer rate and access time — whether or not to go for a drive specially tailored for AV (Audio Visual) applications. All drives have to

usage, these gaps do not occur, so periodically a short hiccup of anything up to about a second can occur, which can cause momentary halts to recording and playback. This may seriously affect the sustained transfer rate, so various disk drive manufacturers (particularly Micropolis) have designed special AV drives that have had their housekeeping intelligently optimised for continuous recording and playback, with pauses of typically no more than 50ms at any time.

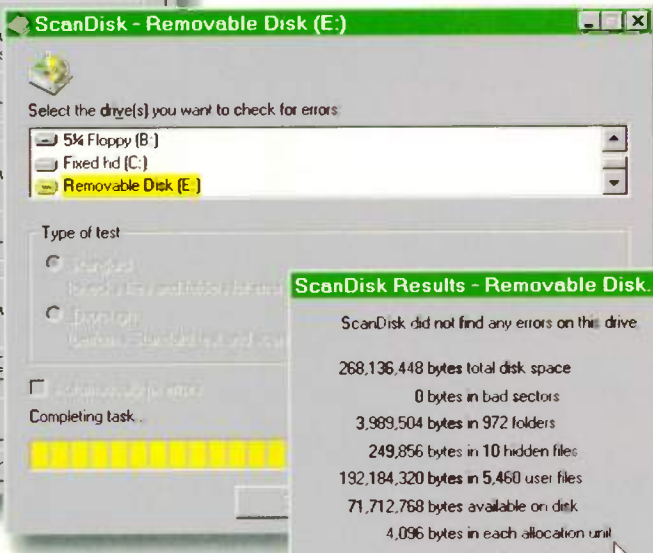
In the real world, most people make do with standard drives and get away with it most of the time by using a decently-sized memory buffer that can cope during the drive pause, but with the price of drives falling all the time, it is sensible to consider an AV type. For high-end hard disk audio (eight tracks and above, with multiple outputs) most dealers will fit AV drives in new systems, as for the small extra outlay it is not worth the risk of occasional glitches. In general, for semi-pro use, a non-AV drive will probably be OK — after all, even if you do suffer a glitch, the next time you run the software it will probably be fine, and you will forget all about it. However, for professional

use, choosing a non-AV drive for a saving of under £50 is simply not worth it.

## DRIVE INTERFACE TYPES

Today, there are only two drive types to consider — IDE and SCSI. Most PCs come with IDE (Integrated Drive Electronics) drives as standard. These incorporate the electronics needed to control the drive as an integral part of the assembly, so that the drive can normally be plugged directly into modern motherboards. Up to about 1994, there were limitations for IDE drives that caused problems for AV users. The maximum drive size was 504Mb for a variety of reasons, and it was also difficult to have more than two drives in a single PC system. These limitations have been overcome with the more recent EIDE standard (Extended Integrated Drive Electronics), which allows up to four simultaneous drives, and a maximum capacity of 7.88Gb. Nearly all modern motherboards will incorporate EIDE capability as standard, still referring to it confusingly as IDE, but it is worth checking which version you have if you are trying to add a large drive to an older PC.

SCSI (Small Computer Systems Interface) has traditionally been associated with high-end applications. It has the distinct advantage of allowing up to seven devices to be attached, with none of the size restrictions of the old IDE specification. With the profusion of devices now sprouting from the average PC, such as CD-ROM



*Microsoft ScanDisk in action. This is the result for a SyQuest 270Mb drive — notice that for a drive of this size, each allocation unit (or cluster) is 4K in size.*

pause periodically to carry out what are normally referred to as 'housekeeping chores'. These involve error recovery and thermal recalibration as the unit changes in temperature. Most drives perform this recalibration about every five minutes for the first 30 minutes after switching on, and once every 25 minutes or so after that. Normally, this will occur during gaps in the data stream. In continuous AV

## FORMATTING

There are three major steps to completing a format on any hard disk. Low-level formatting is normally carried out by the manufacturer before you buy a drive, and involves the physical laying-down of tracks and sectors on to the disk. At the same time, any defects (bad sectors) are marked so that the computer will not try to use these areas. Contrary to popular opinion, no disk drive is perfect, and each will have its share of defects. To some extent, a drive with more marked defects will have undergone more stringent quality control. Most users are unaware of these, since most IDE and SCSI drives employ a technique called 'sector sparing'. Although a drive is nominally a certain size, say 1Gb, in fact there will be slightly more capacity on the disk. This means that any defective sector can be replaced with a spare one from the additional space, so that the user seems to have a defect-free drive which reports no bad sectors.

A low-level format is not usually necessary,

unless you wish to totally remove any trace of previous data before selling a drive, recover from data corruption after a nasty crash, or remove all traces of a bad virus infection. Once you have carried out a low-level reformat, if you wish to partition your drive into several separate areas (see the section of this article on partitioning for more details) you should use the *FDISK* program supplied with Windows and DOS. This will write special information to the boot sector of the drive, so that DOS and Windows can then treat the drive as several smaller ones, each with its own letter (C:, D:, E: and so on). Once any partitioning has been done, the *Format* command can be used to carry out the high-level format which writes the *FAT* and directory structure for each partition, so that files can be managed. This is what most people normally understand as 'formatting a disk'. If you are using SCSI drives, the manufacturer will normally provide specific format utilities, which must be used for low-level formatting, but for high-level formatting, the normal Windows/DOS command can be used instead.



and CD-R drives, backup tape drives, scanners, and removable drives, even the four devices allowed in the EIDE specification may seem restrictive. But the biggest advantage of the SCSI buss is that it allows devices to be plugged in externally as well as internally, and this has resulted in many musicians buying small external removable drives such as the Iomega ZIP, with its 100Mb capacity. This is so portable that you can carry your drive and several data cartridges with you, connecting to any other PC easily and reliably. The disadvantage of SCSI is that it means the purchase of a separate controller card, which sits in one of the PC's valuable slots. SCSI drives are also always a bit more expensive than an equivalent EIDE model.

Comparing performance of the two types can be tricky — many people mistakenly consider that SCSI drives are significantly faster than EIDE types. However, since many manufacturers have identical drive units in both versions, it turns out that the additional overhead of going through the SCSI buss will result in the EIDE version being slightly faster. It is the SCSI *buss* that allows transfer rates at up to 40Mb/sec, not the drive! In high-end systems, SCSI devices have the distinct advantage, since they have embedded disk controllers that can function independently of the main processor, and simultaneously with each other. Although IDE drives have similar controllers on board, they cannot operate simultaneously, and so multiple drives in an IDE system will work one at a time.

## INTERFACE PERFORMANCE

All hard disk controllers and SCSI adaptors require the use of one or more of the following PC resources: ROM addresses, IRQs, DMAs, and I/O port addresses. The individual settings for specific devices are many and varied, but the performance implications for the different types of data transfer are worth explaining in more detail, since they will directly affect the ultimate performance of the drive. DMA (Direct Memory Access) is a means of transferring data directly to and from memory without tying up the main computer processor. Although DMA transfers are normally highly efficient, machines with ISA slots have slow DMA controllers on the motherboard, and so most drive interfaces now use a technique called Programmed Input/Output (PIO), which sends bytes through the I/O ports. This type of transfer is normally faster than DMA, especially in its more recent forms which support block-mode PIO, allowing the transfer of multiple blocks of data with only one interrupt to the computer processor. Any adaptor that needs no DMA setting will normally be a PIO type.

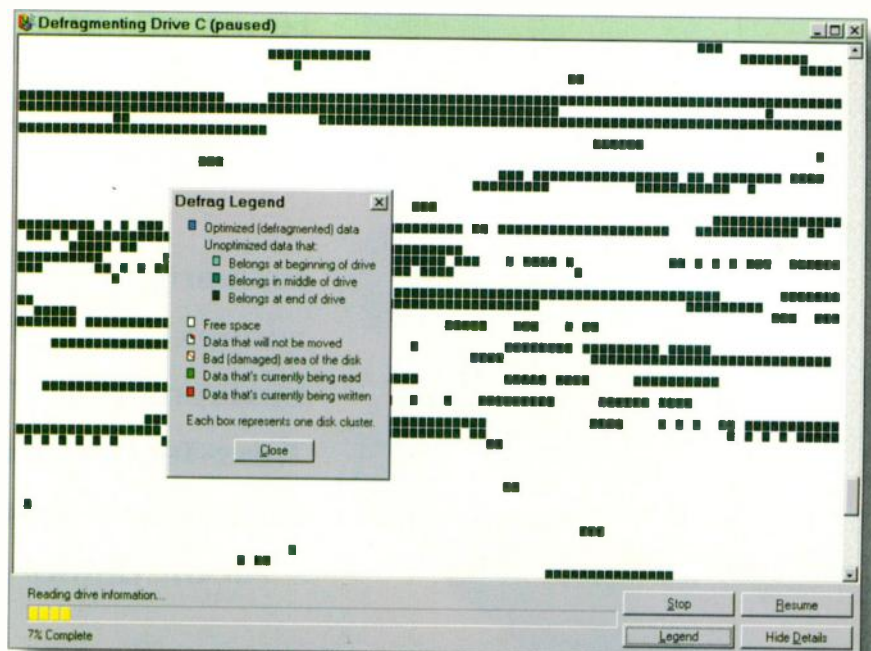
There are five Modes of PIO supported by the EIDE specification, numbered 0-4, and the highest supported by a drive will normally be printed on its packaging. Most high-performance modern drives support PIO Mode 4, which offers a maximum transfer rate of 16.6Mb/sec (note that this is the theoretical maximum — the actual transfer rate is

### PROBLEM AREAS — USING SCANDISK

Many people are happy to leave their disk drive to get on with things, and would never think of using a repair utility unless they received an error message declaring a missing or unreadable file. In fact, regularly using a utility like **ScanDisk** (provided with all versions of DOS 6 and Windows 95) can help maintain your drive, and spot any errors at an early stage before they get out of hand. Some authorities even suggest placing *ScanDisk* into the StartUp directory so that it runs every time you boot up your machine. I prefer to run it about once a week, and certainly every time at reboot after any

program has crashed. It is not only corrupted files that can cause problems — occasionally an entry in the FAT (see the section on partitioning elsewhere in this article) can get cross-linked — ie. two files end up with the same directory entry. *ScanDisk* can rectify most problems like these, giving you the option of deleting the offending data, or more sensibly converting it into a file that can be read by any text editor, so that you can see the contents to determine whether there is anything of use to salvage. Lost file fragments (any data without a corresponding directory entry) can also be recovered. Although *ScanDisk* is effective and free, many professionals would recommend a commercial program like *Norton Utilities* for extensive faultfinding and major problems.

determined by the drive specification). This fastest mode must, however, use a PCI connection, and on many computers, only one of the two drive connectors are connected to the PCI buss, the other being an ISA version which will only allow up to Mode 2 operation, giving a maximum transfer rate of 8.3 Mb/sec. If you intend to use several



EIDE drives with your PC, bear this possible limitation in mind. Many SCSI drives also use PIO as the method of data transfer, but higher-performance SCSI devices use buss master DMA, which effectively takes control of the DMA buss and overrides the normal DMA process. Transfers using this technique can be much faster than PIO transfer.

## USING MULTIPLE IDE DRIVES

Setting up a single IDE drive is extremely simple; you normally 'plug and go'. If you intend to use two drives, one for general use and the other specifically for hard disk recording, several complications may ensue. Jumpers (small switches)

*The Microsoft Disk Defragmenter in Action. This drive was declared 0% defragmented, but as you can see, although the files are not themselves fragmented, the data is still scattered in little packets all over the disk.*



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## Choosing PC disk drives & controllers

- ▶ on each drive may need to be set, so that one is designated the master (containing system files needed to boot up the computer) while the other is the slave. Sometimes, the drive on a slave setting will be delayed for several seconds at startup to allow the main drive to get going first, thus reducing the initial loading on the computer power supply. In the past, certain compatibility problems made older IDE drives temperamental about working with other drives, especially if each was from a different manufacturer — in the worst cases, the computer would fail to boot up at all. Most recent drives will have none of these problems, and installation will consist simply of connecting the appropriate leads and setting one jumper to either master or slave.

### PARTITIONING

To prevent your computer's operating system storing a new file on top of an old one, a hard drive maintains a table of which file is currently using which area on the disk. This is known as the File Allocation Table, or FAT. Modern versions of DOS allow up to 65,536 (or 64K) file entries, and each

can occupy one or more Allocation Units (also known as clusters) of hard disk sectors. The size of each cluster is determined by the size of the drive itself. With a typical 1Gb modern drive, a maximum of 64K possible files results in a minimum file size of 16K (1Gb divided by 64K). This will mean that in the worst case, a 1-byte file will still occupy a single cluster of 16K on the hard disk. If you look at typical file sizes on your drive, you will probably find hundreds that are less than 16K in size.

All of this means wasted drive space, and this is partly why compressed drive software (see the 'Neat and Tidy' box) can be so effective. The problem has got worse as hard drive sizes have increased, since with each doubling in drive size, the cluster size also doubles. In one classic case, someone upgrading from a 500Mb drive to a 1Gb version found that after copying his files across, they took up 700Mb, simply because so many suddenly occupied double their previous space on the disk. A new version of the FAT (FAT32) will appear in a future upgrade to Windows, which will apparently tackle the problem more intelligently, with an unlimited number of file entries, and 4K clusters with any drive up to about 8Gb.

In the meantime, there are two ways to get back some of the wasted space. Firstly, by 'zipping' up complete directories of rarely-needed files, not only will the files themselves be compressed, but the disk space will be used more efficiently, since tiny files will use far less space. You can quickly 'unzip' these directories if they are needed again, but have more disk space in the meantime. Say

you have a 1Gb drive (16K clusters), and in one directory you have 64 files that are 256 bytes or less. Normally, each would occupy a single 16K cluster, so that the space taken up by all the files would total 1Mb. By compressing the contents of the directory, the total file size will still be under 16K, which would only occupy a single 16K cluster with space to spare; a saving of 1008K!

A second solution is to divide up the drive into two or more separate partitions by reformatting the disk, and then each partition will have a smaller cluster size. Each partition is treated by the operating system as a separate drive with its own individual letter (for example, your drive C: could be partitioned into two logical drives, C: and D:). Although having separate partitions is a bit less convenient than using one large drive, it does have another benefit for musicians. It is far easier to use a large separate partition for hard disk recording, since file sizes here are normally high anyway, and also defragmenting is easier and faster to do, since there will be far less files. Backing up data is also easier to keep track of, since it is separate from the operating system files, day to day programs and their data.

### TO BOLDLY GO...

It is difficult to recommend specific drive models, as manufacturers are constantly releasing new models at ever-decreasing prices, and with ever-increasing specifications. If you intend to use a hard disk with one specific package, look through the manual, help files, any web site maintained by the software manufacturer, and other product information such as catalogues and brochures, to see what recommendations they make for hard disks. There is no sense in re-inventing the wheel when manufacturers may already have a list of suitable drives for use with their product, and if you aim at equalling or bettering the specification provided by the software package you intend to use, you won't go far wrong.

One more thing is definitely worth bearing in mind — in the analytical atmosphere of the recording studio, there is nothing worse than a whining hard drive (I know, because I have one!) Although you can place the computer in a padded case (as long as there is still adequate airflow for cooling purposes), it is difficult to move it far from the monitor and keyboard (but see our 'Silent Running' feature elsewhere in this issue for some suggestions!). If you are buying a drive from a retail outlet, ask to hear a machine with the same drive already installed to obtain some idea of its noise output. You may get some funny looks, but you will be the one living with the beast for the next several years.

In next month's concluding part, I will look at the implications of 'going SCSI', its advantages, the extra cost involved, and how to choose the best SCSI controller card for your application. I will also try to make some sense of the mass of often conflicting information about SCSI types that can be bewildering to newcomer and old-timer alike.

SOS

“One more thing is definitely worth bearing in mind — in the analytical atmosphere of the recording studio, there is nothing worse than a whining hard drive (I know, because I have one!).”



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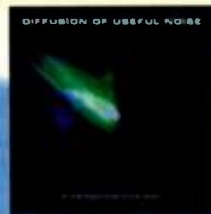
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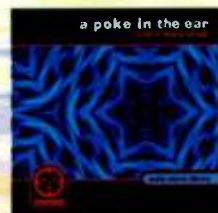
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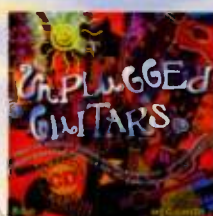
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Since the late '70s, it has become a habit for recording artists to take longer and longer to write and record their music. Peter Gabriel, most famously, may take several years to record an album. At the other end of the spectrum, there are still a few bands and artists who will write and record an album in a matter of weeks.

And then there's Harold Budd. The American ex-minimalist, ex-college lecturer, experimental ambient composer, solo artist and *bon viveur* may have taken eight years to release *Luxa*, his first solo studio album since *The White Arcades* (1988), but the speed and working methods with which he created his new album beggar belief. *Luxa* is a full 62 minutes and 32 seconds long, contains 16 pieces, and the music on it was written, played, recorded and mixed in just 11 days. On top of this, Budd still had time, according to engineer Michael Coleman (who recorded the album at his Orangewood Studios in Mesa, Arizona — see 'Engineering for Harold Budd' box), to "come into the studio some mornings, decide that he didn't feel inspired at all, and call it a day". At other times, Budd would spend hours trawling through synth sounds, trying to find a sound he liked, yet all Coleman would hear, in response to every sound that Budd tried, was: "Hate it... hate it... hate it... hate it... hate it... hate it... hate it..." But, adds Coleman:

relaxed timing and infallible use of space.

Despite its spaciousness, however, *Luxa* is musically richer than *The White Arcades*. The latter album consisted largely of slow-moving, warm and sleepy atmospheric synthesizer parts, whereas *Luxa* is harsher and starker, features much more solo piano, and employs more rhythmic devices, largely courtesy of Budd's huge collection of ethnic rattles, shakers, gourds and bells. In short, *Luxa* is a minor masterpiece that demonstrates that there's still life in ambient music, and that it's still possible to make a meditative musical work that's neither New Age kitsch, nor weighed down by the numbing repetitiveness and sterile conceptualism that's hampered the minimalist and ambient genres for so long. Inhabiting an aesthetic universe all its own, *Luxa* also demonstrates that it's still possible to forge a recognisable musical identity with the use of modern keyboards.

### PRETTY REVOLTING

This 60-year old former classical avant-garde composer and college professor, with a general dislike for samples and digital keyboards, manages to give many younger artists a run for their money when it comes to creating character with modern music technology. To understand how he does it, it's necessary to assess where he's coming from and go back in time for a moment to retrace a few of his most relevant steps. Born in 1936 in Los Angeles, Budd graduated in music composition in 1966, and taught at the California Institute of Arts between 1970 and 1976. As a classical

# Harold Budd

AMERICAN VISION

# Budd

*Despite having waited eight years to create the follow-up to his 1988 solo album, experimental composer Harold Budd composed and recorded*

*the new album, Luxa, in just 11 days.*  
**PAUL TINGEN finds out how it was done.**

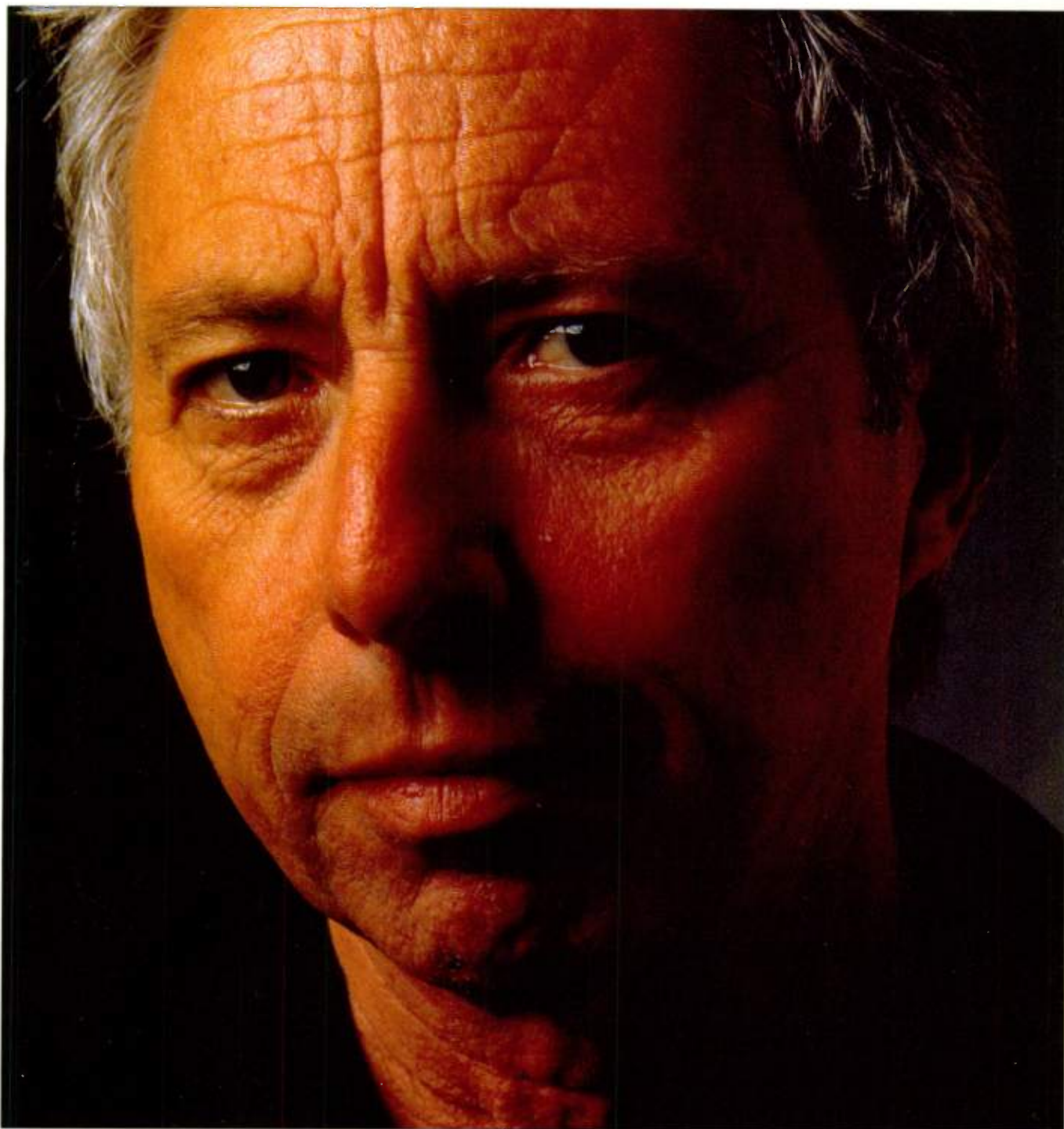
"When he's 'on', he's really on and it's fascinating to watch him work. He's a really nice guy, very laid back, very easy-going, yet when he's inspired he just explodes creatively. He knows exactly what he wants and knows how to get the sounds he wants, and he works really, really quickly."

Budd must indeed work very quickly, for although the music on *Luxa* falls clearly into ambient territory, its 62 minutes are not filled with endless repetitions, nor with basic musical ideas stretched beyond breaking point. Instead, every piece on *Luxa* is based on a clear idea, has a beginning, a middle, and an end, and, although they're low on melody and high on atmospheric synthesizer pads and piano improvisations, there's a definite and captivating musical structure that runs through each. It's all held together by Budd's

composer living in California during the '60s, it was inevitable that he would be strongly influenced by the radical American composers of the day. These included the original and most radical of avant-gardists, John Cage, who tore all musical conventions to shreds. LaMonte Young, Terry Riley, Philip Glass and Steve Reich, who tried to find a way out of the cul-de-sac of total freedom and total chaos through the tonal repetition of minimalism, were also influences.

It's during a beautiful, sunny, early Autumn day in London that Budd leans over a pint of beer in a West London pub and thinks back to his musical roots: "In the very early '60s, John Cage had an enormous impact on me — but I must say more through his writings and the example of his lifestyle than through his music. He showed us that it was possible to be an artist without selling out to the academy, and to go directly into art itself. That was an important heroic posture for almost all American artists at that time. But by the early '70s I had shifted my position and had





become aggressively against the avant-garde. I felt that it had pretty much run its course, that it was self-congratulatory, and that if you couldn't tell the difference any more between the pieces of one avant-gardist and another, it had become sterile and pointless. There were no yardsticks any more to measure the quality of a piece. Anything went, and that had a deadly effect on the movement. And I'm not even talking about the European avant-garde here, of people like Stockhausen and Boulez, because my generation detested that with an almost militaristic anger. The European avant-garde came directly out of the institutions, was therefore the mother of all evil [laughs], and had to be overthrown by a radical revolution."

Like many American composers, Budd saw the

"Don't get sucked into distractions, don't listen to the siren chorus about this keyboard that has a billion sounds in it."

answer to the problems of "sterile" avant-garde music in the tight structures of minimalism, and he started to bring his music back to bare and tonal essentials. However, the direction he took was different to other minimalists. Firstly he steered clear of the 'pattern music' of Reich and Glass,



# Harold Budd

► and secondly he became “fascinated by old-fashioned music, like mediaeval and Renaissance music. I found delights and wonder in a musical language that was really uncool, that was really unhip and had nothing to do with avant-garde, and that was also different from the starkness of much minimalistic music. When I made my break from avant-garde in 1970, both psychologically and aesthetically, I pretty much rejected everything I had done until then, but didn't quite know which direction to go in. But once I hit on my interest in older music, I found a new direction, in which I purposely tried to create music that was so sweet and pretty and decorative that it would positively upset and revolt the avant-garde, whose ugly sounds had by now become a new orthodoxy. Hard as it is to imagine now, the prettiness of my music was very much a political statement at the time.”

## THE TYRANNY OF EVERYTHING

Budd made more political statements, some of which seem rather dated now, such as his

“A studio gives you the freedom to do everything, and to me everything is a tyranny.”

*Madrigal Of The Rose Angel* (1972), for harp, celeste, percussion, lights and a topless chorus of female singers. It's a work which he now calls, with a big grin, “blatantly sexist”, and which was very much rooted in its time. But with his new-found emphasis on beauty, tonality, simple but clear and often old-fashioned-sounding harmonic developments and atmospheric textures, Budd had laid the foundations for a style he is still exploring today, and of which *Luxa* is only the latest manifestation. There were, however, two more ingredients that were to radically shape and transform his music and his way of composing. These were both introduced to him by Brian Eno, who produced the recording of Budd's composition *Pavilion of Dreams*, in 1978. The two ingredients were the use of the recording studio as a musical and compositional instrument, and the synthesizer, with which he developed a powerful love-hate relationship. Budd: “Eno totally showed me the studio world. You start with an idea and then you use the studio as your palette. To me, that's much more interesting than writing a string quartet, having it performed correctly and making a documentary of that. I have no interest in that whatsoever any more, even though I, unfortunately, think that *Pavilion of Dreams*, which was done in the ‘old’ way, is still my best album. But the thing is that using the studio as an instrument, and using synthesizers, just works — even though I don't actually like those damned electronic keyboards.”

In 1978, then, Budd effectively stopped being a ‘classical composer’ and became a recording artist, for whom “recording and composition became equal members of the creative process”, rather than two separate entities. Switching to a more ‘rock music’ approach to making music also meant that Budd became embedded in the rock music world from a social and cultural point of view, and gained himself a rock audience. One other result was that, as well as working on the various solo albums he's released over the years, he became heavily involved in collaborations with rock music artists such as Brian Eno (*The Plateaux Of Mirror*, 1980; *The*

## MICHAEL COLEMAN: ENGINEERING FOR HAROLD BUDD

Michael Coleman is a 36-year old American keyboard player and songwriter who became involved in recording in 1983, when he started Orangewood Studios on the outskirts of the small town of Mesa, near Phoenix, Arizona. His studio has since turned into a full-time venture, mainly catering for local musicians — Harold Budd is his first internationally-known client.

Most clients appear to be attracted to the unique, rural location of the studio, and Coleman's no-nonsense attitude to recording and equipment: “I prefer to stay out of the whole new equipment rat-race. I've just purchased three ADAT XT machines with BRC, purely because I was running out of tracks with my Tascam MM1 16-track. But the ADATs are the first major new equipment I bought since 1987. I think a lot of the new equipment sounds so sterile it's pitiful. So I don't see the point of spending money on things that I don't think are as good as the things I have, and if people call me asking for the latest of the latest, I tell them that there are several other studios in the valley they can go to.”

Apart from the Tascam 16-track, Coleman used a small selection of gear for *Luxa*, including a Trident Series 65 desk (“I love the sound of it. It's far better than anything else in its class.”), Tannoy Gold monitors, Lexicon PCM70 for delays and harmonising, Lexicon PCM60 as the main reverb, with a Yamaha REV7 as a stand-by reverb, and a PCM42 as a digital delay. His piano is a Yamaha Conservatory six-foot Grand, which he recorded with a Neumann U89 on the top end and a U87 for the bottom end, placed above the strings under the wing. *Luxa* was assembled on a Mac running Digidesign software, and after level adjustment, topping and tailing and fades, it was mastered to a Tascam DA30 DAT. Coleman: “The mastering engineer didn't do anything to that tape during mastering, which is an indication of how accurate I can record things here.”

From talking to Coleman, it's clear that working with Harold Budd was quite an experience: “When he's on he's really blowing.

He knows exactly what he wants, knows how to get the sound he wants, but he's very open to hear my ideas. This means that it's really great working with him. It's also fascinating. For most of the pieces, he asked me to put on a click of some sort, but that seemed more to set a mood or something, because 99% of the time he didn't play to it. Titles are very important to him, and he



usually would start a piece with a title, but I must say that I don't know what the relationship was between a title and the music that he came up with. I don't think they had anything to do with each other. A lot of the music was improvised; he didn't have any charts, and nothing was written down, apart from one small chart for some idea that he wanted to remember, and one for the piece by Marion Brown. He divides his time pretty equally between piano and synth, but it's the piano that's clearly his real love. He's really into creating things that sound new and different, which is why he hates digital synthesizers so much, because they sound so predictable, and which is why he uses so many treatments, even on acoustic piano.”



*Pearl*, 1984), The Cocteau Twins (*The Moon and The Melodies*, 1986), XTC's Andy Partridge (*Through The Hill*, 1994) and Hector Zazou (*Glyph*, 1995). What also becomes clear, however, is that despite his association with the rock music world, Budd has managed to avoid many of its trappings. We've already seen that he's stayed clear of the rock habit of spending years and hundreds of thousands of pounds on making a record. And an inkling of how he manages that comes when it emerges that he's also stayed entirely out of the equipment rat-race that can be so distracting when it comes to making music. The amazing fact is that not only does Budd not have his own recording facility, he actually doesn't own *any* musical instruments whatsoever.

Budd explains: "I'll tell you why... There's a quote from Ralph Waldo Emerson, something to the effect of: 'if you can't be free, then be as free as you can be'. And I like the arbitrary restrictions that one places on oneself, so that you don't get scatterbrained and don't reach for everything that's available. Keep your focus very narrow: just this and nothing more, and make that absolutely exquisite and don't get sucked into distractions, don't listen to the siren chorus singing across the waves about this keyboard that has a billion sounds in it. I couldn't care less about things like that.



*Harold Budd and Andy Partridge, with whom Budd released an album in 1994.*

They just get in the way. I'm not bragging, but the way I work is that I focus entirely on a small thing and try to milk that for all it's worth, to find everything in it that makes musical sense. A studio gives you the freedom to do that, but it also gives you the freedom to do *everything*, and to me everything is a tyranny. What's the point? So for me it's a conscious choice to work in a studio when I want and need to, but not to own a studio. It's the same with owning instruments. All I have is an old, worthless Casio 202, which I don't even use any more, and the shakers and bells. I don't even have a piano any more."



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# Harold Budd

## BREAKING THE ICE

This may sound extreme, and it is, but when Budd describes the creative process that led to *Luxa*, it starts to make sense, and at least enables you to understand how he manages to work so quickly. The secret, it appears, lies in at least five working methods and approaches. First, it turns out that Budd works long and hard in his mind at getting a clear concept and focus for a work. Second, he chooses both studio and engineer carefully. Third, he limits the number of instruments he uses. Fourth, he takes advantage of a few psychological tricks that get the creative juices flowing. And fifth, he knows when to stop and when not to even start. Budd elaborates on these points: "Even though it's true that the writing and recording of *Luxa* took only 10 days, it actually took me six months to prepare the album. I prepared the sequence of the works, the structures, the titles, the ambience, the mood, and so on. I analysed all that very carefully. Part of this work centres on the titles of the pieces, which are of great importance to me, and in the case of *Luxa*, one concept was to work around the names of artists I admire — for example, 'Niki D' stands for the French sculptress Niki De Saint-Phalle. I always have loads of titles with me, and even though I agree with Michael Coleman, that the relationship between music and title may not be obvious in my work, I do believe that a bad title can ruin an

otherwise very nice piece. And the title of the album clearly relates to its contents. *Luxa* is a non-existent word that I derived from the Latin word 'lux', which means light, and I agree that *Luxa* has a great deal of light and buoyancy, as well as long, sombre moods, as a contrast to the light-filled pieces."

So when Budd entered Michael Coleman's Orangewood Studios on June 3rd 1996, did he have any idea of what the music would sound like? "Oh, no, of course not. I'm pretty sure of the direction I'm going in, but many things in the studio happen because of circumstances. Especially with this album, the music was the very last thing that I thought about. It's also the easiest thing. Getting the concept of the whole suite of pieces together beforehand is a very difficult process that takes a lot of thinking and planning. But the music just takes care of itself once I'm in the studio. The only piece I had a musical idea for was 'Serge Poliakoff'. I knew pretty much what that would sound like. It is possible that that piece was a germination point for the music on the rest of

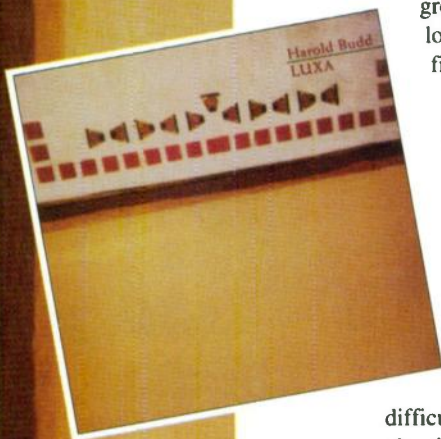
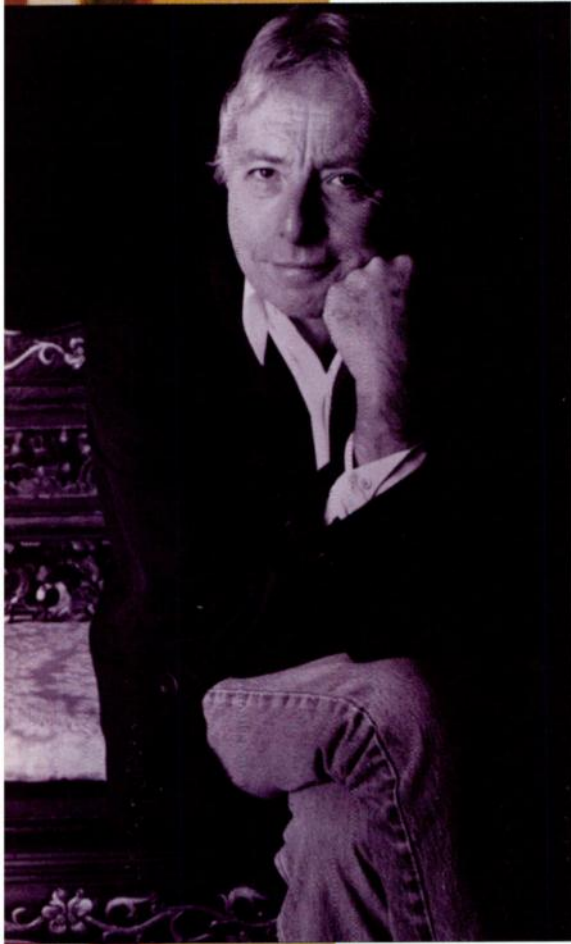
the album. That makes pretty good sense, now that you ask that question. I hadn't thought of it, but it's true that it's kind of glittery and has a carnival-like atmosphere to it, as well as a somewhat decayed, decadent mood. I like that feel very much and wanted to go into that direction."

Running down the other aspects of the Budd recording method, the composer explains that he had worked with Coleman before on an album called *Walking To My Voice: American Beat Poetry*, on which Budd recites 33 American beat poems against his own musical backdrop, and which was recently released in Italy only. Budd liked Coleman, liked the unassuming small studio in idyllic rural Arizona, and liked the simplicity of Coleman's setup, which featured, at the time, only a 1-inch Tascam 16-track analogue tape recorder, Trident Series 65 desk, Tannoy Gold monitors and a collection of Coleman's keyboards — of which Budd only used a few.

When Budd started work at Coleman's place, he made sure that he wasn't starting, so to speak, with a blank sheet of paper, immediately beginning work on the two covers that feature on the album: Marion Brown's 'Sweet Earth Flying', and Steve Brown's 'Pleasure'. Budd: "'Sweet Earth Flying' was recorded and mixed in an hour, just piano and

"I always try to get started on something that doesn't bring up any problems; then you can move on to the more problematic works and you and the engineer will have faith that you'll find successful solutions."

a very quiet, treated sample of a girls' choir from some ancient Roland, I can't remember which one [an MKS70, according to Coleman]. But the whole reason for starting with the covers was that when you go into a studio, the first and most important thing is to break the ice, to get things flowing, and get the engineer familiar and comfortable with what you're doing. I always try to get started on





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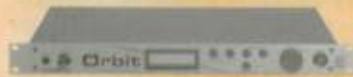
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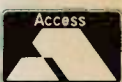


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# Harold Budd

“I’m not a pro. I couldn’t play covers. I’m actually hopeless at music, except for this narrow niche.”

► something that doesn’t bring up any problems: then you can move on to the more problematic works and you and the engineer will have faith that you’ll find successful solutions. It’s a psychological way of breaking down barriers as soon as possible, so you can work more efficiently and with better results.”

## NO WAVING FLAGS

On to the instruments that Budd used, and his love-hate relationship with music technology as a whole. For a start, there’s no sequencing on *Luxa* — everything was played live by Budd and overdubbed. And even though Budd always started with a click track, he hardly ever followed it slavishly, and appeared to use it more like the way he uses titles: as a spark to get him going. And when Budd is asked about the exact keyboards he used, he starts to fidget: “They just bore the shit out of me. I couldn’t care less. I borrowed a brand-new Ensoniq synth from Ruben Garcia and I never used it. It has 20,000 sounds in it and was just too intimidating. I could spend a whole day with it and still find nothing I liked. When I was going through the sounds and saying ‘hate it’ every time a sound came up. I was not talking about the instrument but about the process of having to find good sounds on that keyboard. I think that the sounds that keyboard makes are terribly boring, and I hate to say that, because I think that Ensoniq are generally one of the better synth companies. I did use an old Ensoniq Mirage sampler with floppy disk a lot, which is great, and an old analogue Roland SH3, which I particularly used on Steve Brown’s piece. Then there was a little bit of a Proteus module that I borrowed from the guy that cleans my house, and the ancient Roland [MKS70], and that’s about it, apart from Michael’s piano, of course.”

The very limited set of sound sources that Budd used on *Luxa* may well be one of the main reasons why the album inhabits a sonic and aesthetic universe of its own. But there are clearly other reasons too. It wasn’t easy to keep Budd’s attention on the subject at hand, but he did manage to explain that most of his sound shaping work goes into studio treatments, rather than playing around with the program parameters on the sound sources: “I actually don’t care whether I use analogue or digital keyboards or samplers. I just go in there and try to find something that sounds good, and if changing the sound parameters in the keyboard isn’t too offensive, I’ll deal with it. But I never think about how I do it.

All the hard work goes into simply doing it and making sure it comes out alright, and I couldn’t care less about what the actual parameters of the instrument I’m using are, or whether I’m using it

correctly. For example, on the piece called ‘Chet’ — which is a reference to Chet Baker — there’s a sound like someone slamming a door way off in the distance. It’s a sound that happens on one of the Ensoniq Mirage’s presets. I found that when I pushed one of the notes down really carefully and slowly, the first sound that came out was this splash sound. No actual musical sound came because I hadn’t pressed the key hard enough. So I used that sound only, maybe four or five times in a seven-minute piece. It’s this kind of use of keyboards that interests me.

“But Michael and I spent much more time and energy on treatments and processing. Much of the processing is very simple — just ordinary harmoniser and chorus effects. ‘Anish Kapoor’ has more elaborate processing. It’s one of the few pieces for which I had actually written out the piano part, and once it was recorded I suggested that we listen to it harmonised, slightly sharp, move it up to where it’s slightly out of tune with itself, then chorus that and take it back through the harmoniser, and this time make it slightly flat, put that through the board with standard reverb, now EQ it and get only the highs and lows... and so on. I’m actually making this up, improvising as I talk, but it was a process like this. We ended up with a sound that took a lot of work and that sounds good, and yet we would only use a teeny-weeny bit of it. It’s only there as a kind of shadow, or backlit sunlight behind the real piano. Almost all of the pieces had something like this, but these treatments aren’t there as waving flags. They’re more an unconscious influence. If you can point out exactly where they are, I would be really interested, because I don’t even hear them myself any more. But it nevertheless gives the whole piece a kind of boost that would not be there if everything was completely dry.”

This is clearly not Budd’s favourite topic, and he concludes by saying that he only got involved in the studio with the simple hands-on stuff, like levels, fade-ins and fade-outs, leaving the rest to Michael Coleman. “I’m a kind of old-fashioned Luddite with equipment. I’m not that interested in it.”

As for the future, apart from his ongoing touring, solo or with Hector Zazou, Budd is currently working on an album with John Foxx, and exploring the possibilities of a new project with Andy Partridge. He’s also still working on a huge piece called ‘1000 Chords’, which is literally that, already five years in the making. Finally, I ask him whether he’s a meditative person, given the nature of his music. After a moment of silence, he muses: “I don’t meditate. I know that my music is very introverted, but to be honest, it’s all I can do. I can’t do any other type of music. I’m not a pro. I couldn’t play covers. I’m actually hopeless at music, except for this narrow niche. And so that’s all I do. It simply comes out that way. I can’t help it.”

Budd grins apologetically. When I declare in response that it’s time to stop and have another drink, his smile widens and he has a short, unequivocal comment: “Cool!”





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# Added Values

Ten years after the K5, Kawai return to the technology which gave them the most successful implementation of additive synthesis ever, and include something of everything else they've learnt in the meantime.

PAUL WIFFEN wonders how it all adds up...

## KAWAI K5000W ADVANCED ADDITIVE WORKSTATION

Give the SOS team their due: they do like to maintain editorial continuity. Once a writer has covered a particular product or technology, they like him to see it through all the developments the manufacturer may make from it. Hence, since I covered the Emu E111 and its successor, the E1V, they asked me to look at the E64 and then the E64K. So I suppose I shouldn't have been surprised when Assistant Editor Matt rang me up to tell me that there was a new synth whose predecessor I had reviewed for them, and ask if I'd like to cover it. I, of course, expected it to be something I had looked at in the last year or two. When Matt told me that Kawai had finally updated their unique implementation of additive synthesis (the first incarnation of which I reviewed almost 10 years ago, in the shape of the K5), I was both amazed and delighted. Amazed because if a manufacturer hasn't got around to developing a new model of a design within a couple of years, you can usually reckon that it has been consigned to the dustbin of history. Delighted because I had been a big fan of the K5 and was feeling the distinct need for a breath of fresh air in the smog of PCM-based, effects-laden synthesizers which assault our ears at every turn these days.

It seemed like only a few years ago that I was looking at the K5 additive synth in Argent's back room in Denmark Street, but Matt informed me that it was back in 1987. Although this made me feel horribly old, I was unable to deny the facts when he sent me a photocopy of my review from the December '87 SOS, to refresh my memory on my original comments on the K5. I approached this piece with some trepidation, sure that my earlier writing style would make the more mature Wiffen cringe, but apart from the terrible jokes (which haven't improved over the years!) many of the comments could have been made today, particularly the intro about music shops and their customers judging an instrument by its presets, rather than properly investigating the potential of its synthesis system for themselves. The only change is that now people judge a workstation by the demo song as well.

### PRESET PATROL

My initial reaction (and those of several of my colleagues) was that there weren't many presets in the K5000W which were going to grab people's attention. There was certainly nothing as immediately impressive as 'Big Time' on the K5, still the best and most playable brass sound I have ever heard from any synth, analogue or digital, sample-based or purely synthetic. Many's the time I regretted not keeping my K5M for that program alone —

the sampled version I have has all the power but lacks the touch responsiveness. If anyone out there has one they want to sell... Although I would never judge an instrument by them, the demo sequences supplied on floppy were somewhat insipid as well, except for the Techno one, which, if anything, erred on the side of brutal. This was the only hint, initially, of the potential of the machine, like a Mr Hyde suddenly emerging from a meek and mild Dr Jekyll.

However, I soon discovered the two mistakes I had made. To start with, only the 120 sounds in the first bank implement the Advanced Additive process at all, and as I had ended up very quickly in the 'B' bank, which is composed entirely of PCM-based sounds, it was hardly surprising that the sounds weren't exciting my jaded ears (the third GM bank was little better, but then haven't we all OD'd on General MIDI sounds?). Secondly, the Advanced Additive programs in that first bank really only show their true colours with real-time manipulations of the mod wheel and the data dial (linked via the softkeys below the display to the most critical sound parameters). Suddenly the whole machine comes to life. Incredibly broad timbre sweeps grab the ear, with swathes of harmonics phasing in and out, the machine alternatively growling and soaring, snarling and singing sweetly — all within single patches. The problem with most PCM-based machines (and this is equally true of the K5000's B and GM banks) is that the only way you can make any convincing change to the sound is to change programs. But Bank AA on the K5000 contains sounds which are really Jekyll and Hyde combinations, depending on your playing style and the position of the wheels. This is how real instruments should be, responding directly to the input of the player, affected by his mood and giving voice to his emotions. Pianists or violinists don't need to switch between programs to go from soothing to vicious — they just change the way they play. Real synthesizers have the same characteristic, and stand out easily from the PCM playback machines by virtue of this ability to radically change their sound in real time and reflect the personality and mood of the performer.

So how are these startling timbre changes achieved, and how does the voice architecture of the K5000 compare to that of the K5?

### CREATIVE ADDITION VS DESTRUCTIVE SUBTRACTION

Most forms of synthesis, from early analogue to PCM-based, take as their starting point a waveform (whether a single-cycle oscillator or a sampled sound), and this contains all the frequencies that final sound can ever have, as the only real tool they offer to change harmonic content is the filter, which just removes frequencies (hence the term

**pros & cons**

**KAWAI K5000W £1759**

**pros**

- Thorough modernisation of the classic K5 — the only successful additive synthesizer.
- PCM samples can be added into additive synthesis for the first time.
- Great effects routing and algorithms
- Good sequencer with large capacity and excellent editing features.

**cons**

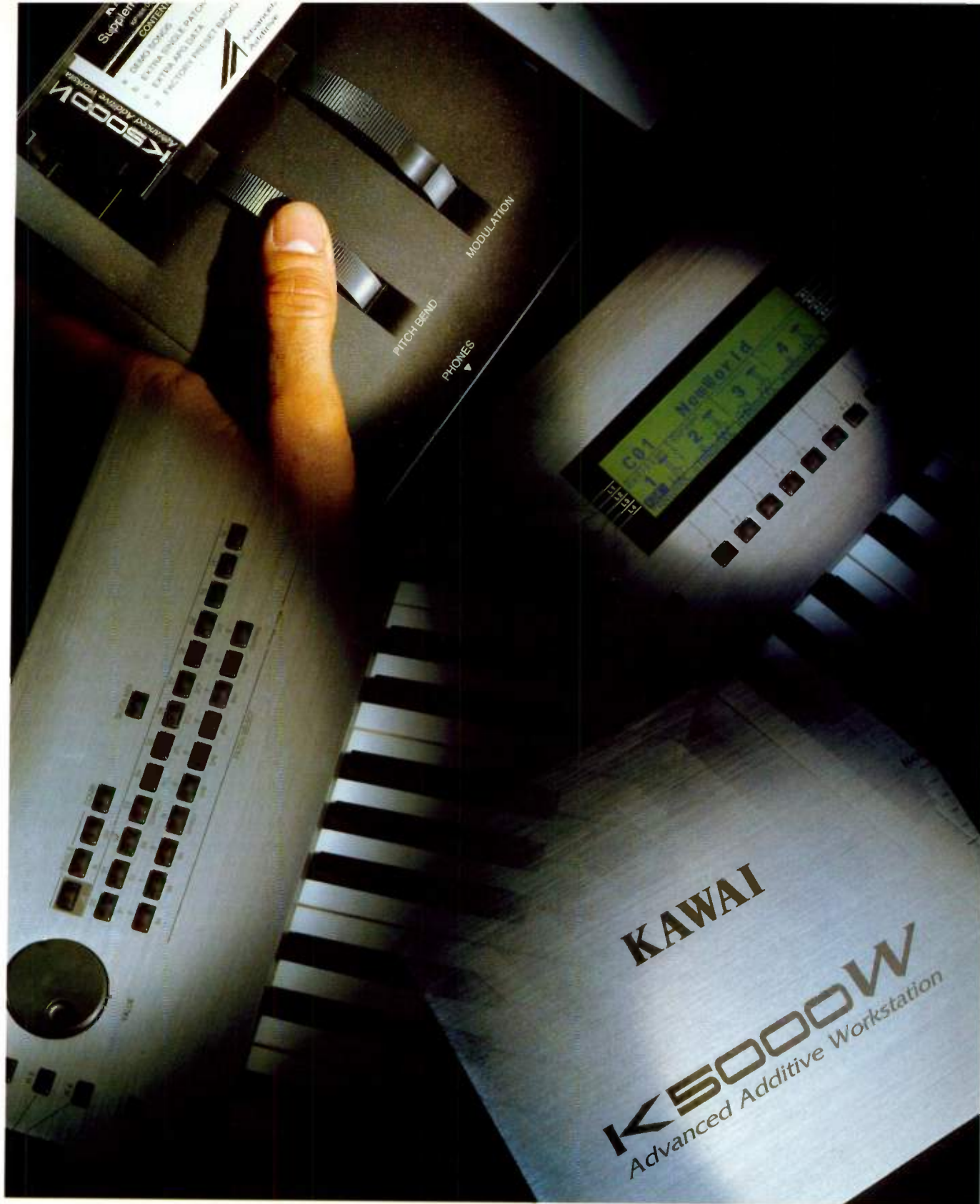
- Uninteresting presets, especially the PCM and GM sounds, don't give a proper idea of the potential of the system.
- Mismatch between excellent Advanced Additive Synthesis and Auto Phrase Generator/Chord Advice system means K5000W seems to be aimed at two different markets. K5000S should solve this problem for synthesis enthusiasts.

**summary**

Advanced Additive synthesis is a real expansion of an already exciting technology, and with a bit of work on your own presets, this could be the most inspirational addition to your sonic arsenal in some time. The APG and Chord Advice side of the workstation will probably only appeal to the auto-accompaniment market, but the sequencer is a good workhorse, with two MIDI Outs and editing features.

**SOUND ON SOUND**





subtractive synthesis), and in a very unobtrusive manner. The results can be quite good with a big fat waveform to start with, such as you can find on the best analogue machines, but if you apply the same technique to samples, most of the time all this does is remove the life and character from the sound. The beauty of additive synthesis is that you add together the harmonics you want to create the required sound — so if you suddenly want to change the timbre, you simply add a different set of harmonics or radically change the level of some but not all. If you think of subtractive synthesis as

sculpture (removing the unwanted bits to leave the required shape) and sample-based synthesis as photography (capturing exactly what is in front of the camera), then additive synthesis is more like oil painting, building up the layers of paint until you achieve the required effect.

The scheme offered for this on the old K5 was already pretty comprehensive (especially since it was the first all-realtime implementation), allowing the levels of 64 harmonics (or 128, if you wanted to annoy the local dogs) to be controlled individually or in groups (odd or even-numbered, octaves or fifths,





# Kawai K5000W



## K5000W FEATURES

- Synthesis Method: Advanced Additive.
- Polyphony: 64-note (split into 32-note polyphony for the PCM sounds and 32-note polyphony for the additive sounds).
- Multitimbrality: 32-part.
- Effects: 50.
- Sequencer: 40-track, 50,000-note.
- MIDI: two sets of In/Out/Thru.
- Auto Phrase Generation.
- Chord Advice.

The K5000S has an arpeggiator and real-time control knobs, but no sequencer, no PCM sounds, and no GM mode.

A 4-times memory expansion will be available for the K5000W from January, along with extra sounds on disk (including a Techno kit). The K5000R (the rackmount version of the K5000S) will be available from February.

► high or low groupings, etc) by envelopes, velocity, pressure or other modulation, with the amount of change being 'angled' to affect the high or low end more or less. Then digital filtering (a heretical concept for academic additive aficionados) allowed a more precise shaping than the blunt analogue equivalent. It was the most flexible implementation of additive I had ever seen (although the ill-fated French-Canadian Technox high-end system of the late '80s was doing some clever things with sample analysis, before the company went bust).

Kawai have kept this same starting point for the K5000 (some of the harmonic editing screens look very familiar, obviously stirring some race memory), but they've added a host of refinements. You can still choose to work with 64 harmonics or combine two voices (known as Sources) to get 128 waveforms (switching the second to cover 65-128). However, now you can have up to six Sources in a Program. This means that you can have six different sets of harmonics, all reacting independently under the various means of real-time control we will cover in a minute. Alternatively, you can replace one or more of the Sources' harmonic series with a PCM sample — "a worse heresy than filtering," I hear all the additive purists cry!

Fortunately, these anoraks, the synthesis equivalent of train spotters, are a dying breed. They used to lie in wait for unsuspecting journalists on the cheaper stands away from the main thoroughfares at trade shows, and having lured you into their lair, waffle on endlessly about how the pure additive system they had developed using mountains of public funding at some third-rate university in the middle of nowhere, could theoretically reproduce any sound with the right programming. But when you finally got them to play you something, it always sounded like a rather cheap, thin drawbar organ (a primitive additive synthesiser in itself, but usually somewhat more cost-effective than their monstrous prototype).

### PCM: NO PROBLEM

As I had no problem with digital filtering on the K5, I have no objection to the addition of PCM sources on the K5000. There are some sounds which no amount of harmonics can build up, usually noise elements with unrelated frequencies, which occur

most commonly at the beginning of natural percussive sounds. This is when the energy level is so high that it spills over into generating harmonics unrelated to the fundamental. By using PCM attacks, the K5000 borrows a technique from a contemporary of the K5, the Roland D50, and allows nature to lend a hand with the least musical bit of a sound.

The 266 PCM sources available for this use in the K5000 (not including the 225 percussion samples) encompass all kinds of blown and plucked instruments, as well as breath noises and other effects (rain, wind, thunder, cars and other natural phenomena). Whilst I would recommend they are used sparingly, there are a few programs where the added realism of the attack peps up the sound no end. I would have loved to hear the 'Big Time' brass from the K5 updated with a real sample attack from a trumpet player. I wonder if you can port K5 programs across to the K5000 via SysEx, or would some poor soul have to sit down and painstakingly enter every parameter manually?

Getting back to the additive side of things, each Source gives you 64 harmonics to play with, and the level of each can be set for the hardest and softest keystrokes, either individually or in groups. The graphic display allows you to see all 64 soft keystroke levels or all 64 hard keystroke levels simultaneously, and switch between them at the push of a button. The same groupings of harmonics for editing levels that were offered on the K5 are available here. As well as Each and All (changing just one or every harmonic respectively), you can select Odd, Even, Bright (the upper 32), Dark (the lower 32), Octaves (1, 2, 4, 8, 16, 32 and 64) or 5ths (3, 6, 12, 24 and 48). As on the K5, a dot appears beneath each affected harmonic in the chosen group. Once you have selected the group you wish to edit, moving the data dial raises or lowers the levels of the selected harmonics. Once you've adjusted the hard and soft harmonic levels, the velocity depth (ie. how much effect velocity has) can be set, and one of 12 crossfade curves chosen to govern the transition between these two. These start at 1 with quick changes between the lower velocities, and gradual changes occur in the higher velocities; 5 gives a straight linear response, and at 12 there's virtually no change in lower velocities,



with all the dynamic response in the upper velocity range.

But velocity isn't the only factor which can change the level of the harmonics. Keyboard scaling can make higher or lower notes on the keyboard proportionately louder or softer. Levels can also be altered in real time using envelopes, but whereas the K5 only gave you four envelopes to alter the levels of each (meaning that each harmonic had to be assigned to a group first), on the K5000 each harmonic now has its own envelope all to itself, increasing the flexibility and subtlety sixteenfold. I guess that the computational power available for the price must have increased at least sixteenfold, because these envelopes are also more complex. They are four-stage (attack, decay 1, decay 2 and release) level and time envelopes with the ability to loop between decay 1 & 2 stages. The K5000's Harmonic Envelope Multiview display lets you select the group of harmonics whose envelopes you want to edit, and lets you visualize the result. This saves you the hours of work it would take if you had to edit each harmonic's level envelope individually. Once you've made the broad sweep adjustments collectively, you can then use the Harmonic Level View display to select and edit each harmonic's envelope individually.

The ability to loop these envelopes means that the harmonic content of the overall sound can be continuously varied. This makes the timbre more interesting to the ear. The human ear is not very sensitive to the relative levels of harmonics when they remain static, but it can perceive the smallest of changes when they happen in

real time. By cycling the envelope, these changes can be repeated continuously for as long as the note is held down. This is the real triumph of the K5000 — that it can manage such complicated changes in real time and thereby excite the ear. The closest analogy to this in analogue synthesis is Pulse Width Modulation, which creates this kind of harmonic change by varying the width of the positive section of a pulse wave using an LFO. As this changes the relative strengths of the different harmonics, the effect is very similar. However, PWM only allows one very narrow set of changes in the harmonic structure. In contrast, the cycling harmonic envelopes on the K5000 allow limitless variations on the harmonic content. Innumerable different timbral changes can be created very simply, each with a character all of its own. I found that once I had set up a envelope cycle of around a couple of seconds, I could quickly create lots of different timbres just by changing the groups that decay 1 and decay 2 levels affected. It was like having endless different variants on the theme of PWM.

Unfortunately, very few of the Advanced Additive programs which ship with the K5000 utilise this ability, and if they do it is extremely subtle. However, many of them use the modulation wheel to change individual harmonic levels, and with them the harmonic content of the sound. By slowly moving the mod wheel backwards and forwards while playing, you can easily hear the same effect. I would strongly suggest that you try this if you go to check out the K5000 in a store, otherwise you're likely to remain unaware of its sonic potential. And if

## SEQUENCING POTENTIAL

The K5000W is referred to as an Advanced Additive Workstation, and Kawal are obviously placing great emphasis on this side of the machine. Those people whose appetites have been whetted by what I have covered so far should look out for the synth-only K5000S (let's hope that Kawal have come up with some more exciting presets); this features all the synthesis potential of the K5000W without the sequencing/styles facilities.

The sequencer has 40 tracks and a 40,000-note capacity, and in conjunction with the Internal 32-part multitimbrality and the dual MIDI Interfaces (In, Out and Thru) of the K5000, means that whether you decide to use the machine's internal sounds or your external MIDI gear you're not restricted to 16 different sounds in your songs. Each track can be assigned to trigger an internal Single program and/or a MIDI Channel — A01 through to B16.

Recording can be either in real time or step time (nice to see this latter capability, which so many sequencers these days are ignoring), and once a track has been recorded you can edit it in

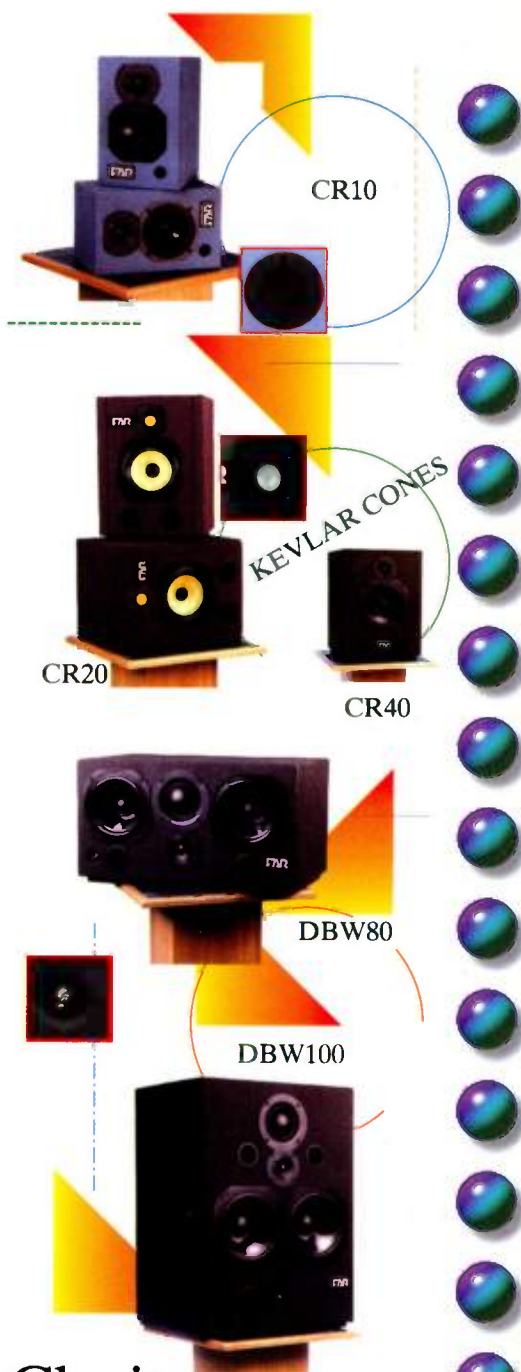
a wide variety of ways. Apart from fairly standard features like List Edit, Quantise, and Insert and Delete Events, there are some more advanced features, like being able to move tracks forward or backwards against the clock, to lay the parts back or push the beat. Gate Time Modify works very nicely on choppy keyboard parts, which change character quite dramatically depending on how long the notes are set to sound for. You can also extract events from a track, based on all sorts of MIDI controllers or note information, and transfer this to another track for reassignment to another sound.

The only problem I could find with the sequencer is that selecting Record actually automatically turns off the Loop function. Loop recording has become a staple of modern sequencing and it seems incredible that Kawal would actually deliberately prevent you from doing it. Fortunately, like all instruments these days, the operating system can be upgraded from floppy disk, so let's hope that Kawal take the opportunity to add loop recording in a future update. Still, everyone's allowed one Idiosyncrasy and the rest of the sequencer seems to work extremely well.

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# Kawai K5000W



## MIX & MATCH

Once you've made yourself a few harmonic envelope-based waveforms and created some morfs (or pinched them from existing patches using the numerous Copy functions, if you're feeling lazy), you're ready to build a Single patch. This is a bit of a misnomer, as up to six different sources can be combined in a Single patch. Of course, many of the individual Sources are complex enough on their own without needing to be combined with others, but following the Wiffen motto, 'Too Much Is Never Enough', I experimented with throwing tons of stuff at the wall and seeing how much stuck. Having picked a few enveloped harmonic Sources and a morf or two, I chucked in the odd PCM sample for good measure. Now that's what I call a sound. The effect reminded me of the Ensoniq VFX's more complex voicings, with lots of separate elements coming and going in the sound. One nice feature is that at any point in the editing process you can mute and un-mute any of the Sources using the F2-F7 keys below the display, so if you're working on one Source you don't have to be confused by the sound the others are making.

Just when I thought I couldn't cram anything else into the Single Mode, I discovered the AM parameter in the Single Common menu. The manual told me this stood for Amplitude Modulation. This lets you use any Source to modulate the Source to either side in the display. Like most forms of high-speed modulation, this is great for adding enharmonic elements to a sound, ie. making incredibly complex sounds even more complex (and therefore unlistenable nine times out of 10). However, used judiciously, I found it had enormous possibilities, particularly if just used for a fraction of a second at the beginning of a sound, where enharmonic elements sound quite natural. There's certainly plenty of scope for future experimentation here.

## FORMANT FILTERING MADE BETTER

In my original K5 review (all those years ago), I heaped praise on the Digital Formant Filter and how its 11-band display made tailoring the pitches at which it was operating simple, by referring to them in octaves, instead of centre frequencies (unless you're a sound engineer, the only musical pitch you will know the value of will be the A below middle C — ie. A440). Well, Kawai have really taken advantage of the drop in the cost of DSP horsepower by expanding this to a 128-band formant filter — one band per semitone instead of one per octave — and providing one per Source (ie. up to 6), when previously it was one per voice. The manual even boasts a table telling you the centre pitch of each band (band number 70 is A440) and the corresponding frequency.

For those of you not familiar with the concept of formant filtering (also known as comb filtering, because of the appearance of the resulting frequency response), it uses lots of very narrow bands to cut or boost very tailored frequency ranges, ideal for making precise and subtle

- ▶ you stop reading now, you would still not know the half of it. Kawai's boffins have come up with some other great short-cuts to sonic interest.

## MORFING MADE EASY

If you don't want to spend any time at all adjusting envelopes, even in groups, there is an even faster way to come up with interesting timbres. Kawai refer to it as the morf display (their spelling, not mine). Here you can select four source harmonic spectra from other programs and have the K5000 interpolate between them to create new timbres. You simply specify which Program and Source you want to take the 64 waveform snapshots from (it uses both the soft and loud harmonic setups), together with the timing intervals between each phase. It is also possible to have the morf cycle between phases 2 and 3 to keep the sound moving. Once you have specified the sources and the timing (with or without looping), you press Exec, and the K5000 does all the hard work for you, creating all 64 envelopes based on the level of each harmonic in the four phases. The resulting morf is then instantly ready to be used as a Source in a new timbre.

There are two ways you can use this. The scientifically-minded amongst you may want to try and plan the resultant sound by carefully matching similar harmonic spectra. Those who place more faith in serendipity may want to try entering Programs and Sources at random and seeing what they get. I tried both approaches. Planning was never as predictable as you might think, although I started to get better at mixing and matching harmonic spectra, so that the results weren't too wild. The random approach produced horrible noises most of the time (although some of them were splendidly horrible, if you take my meaning), but every so often it produced a real gem of a sound that you couldn't have planned or imagined in advance.

The best thing about this feature was that the results it produces are quick and often give completely unique sounds, which recall very few other synths (OK, maybe the odd hint of PPG here, a touch of Prophet VS or Korg Wavestation there, but nothing reminiscent of the current crop of tired PCM timbres). It's a breath of fresh air to ears stifling in stagnated sample layers. Even the heaviest sounds are without the leaden stodginess you get when you throw a load of PCM sounds together and smother them in effects.

## ADDITIVE EFFECTS

Of course these days it's virtually impossible to sell any keyboard without built-in effects (unless it's a monophonic analogue synth), and Kawai have not neglected this side of the K5000's capabilities. There are four effects busses (not including the reverb block), each with its own independently-selectable effect. Each additive or PCM source can be independently assigned to one or more effects, using a special Grid system which makes it instantly clear which effect is going where. You can choose from 37 different effects, including various delay configurations, choruses, flangers, phasers, rotary speaker and autowah, exciters, enhancers and distortion/overdrives. These can be configured in four different routing algorithms, to allow you to decide which effects are summed and which are fed through each other. They are all then routed through the Reverb (11 different algorithms) and Graphic EQ.

Again, there's very little in the K5000 presets to reveal that the effects implementation is so complete. But a five-minute exploratory mission was enough to convince me that this side of the machine hides a few exciting possibilities, especially in those algorithms where the effects are in series, so that you can 'effect an effect'. The potential for making outrageous and unique sounds was here too.



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# Kawai K5000W

► changes to the sound. If you think of the normal low-pass filter as a machete, think of the formant filter as lots of surgeon's scalpels. Each of the 11 bands on the K5 was tuned to an octave of C, but on the K5000 each band is assigned to its own semitone division.

Of course, just as with adjusting individual harmonics, setting the amount of boost for 128 different bands is incredibly time-consuming, so Kawai have used the same grouping concept as for the harmonics. The following groupings are available for simultaneous editing: Graphic EQ, 20-band, 15-band, 10-band, 5-band and All. The Graphic groups the entire range into a classic 8-band graphic format, producing the typical elliptical EQ pattern within each group (ie. the centre frequency of each band boosted the most, with progressively less boost as the frequencies move away from the centre). The others move the number of bands stated with equal boost to each within the group. This gives you the ability to set the formant filter shape as coarsely or as finely as you like. Obviously, you would use the wider groupings first to get roughly the shape you want; the narrow groupings, or even individual band editing, will then let you tailor it more precisely.

There's a bias control which allows you to shift the bands up or down one octave (+/-12 semitones). This means that if you have set up an effect to accentuate particular pitches in a particular key (say root notes and fifths) and then you decide to change the key, you can re-tune the comb filter to the new key. However, much more useful than the ability to set a fixed bias is the ability to shift the comb filter with an envelope. This means that some pretty outrageous sweeps can be created, and as the envelope is the same as those for controlling the volumes of the harmonics, it can be looped in the same way between the two Decay stages, to create a constantly moving effect. Do this on a Source which already has looping harmonic envelopes (preferably at a different speed) and the effect gets really wild. Shame they never made any presets which use this facility.

## COMMON AS MUCK

So far everything we have looked at is available at Source level — so you could (if your taste is for excess) have six of these voice channels all doing wildly different things for each note triggered (with the attendant reduction

in polyphony, of course, as each Source takes a note of the 32 available at any one time). However, I found that two or three Sources, used to maximum effect, created such a complex sound that anything else would have been gilding the lily.

From now on, things get much more ordinary, as all parameters described henceforth (referred to quite significantly on the K5000W as Common) are pretty standard for any PCM-based synth.

These Common parameters are also available for editing both the PCM-only programs in Bank B and the General MIDI presets in the third bank. However, all the sounds you create yourself must be saved to the 48 user editable locations in Bank B if PCM-based, or to the 60 user locations in the first Bank if they contain additive stuff as well. The General MIDI sounds cannot be overwritten (which is just as well — there's no point in having General MIDI if some of the sounds may not be available because they've been overwritten).

As far as the quality of the PCM samples is concerned, there's nothing actually wrong with them — indeed, it was their 'sensible' workaday nature which caused me to lose interest. After exploring the innovative Advanced Additive architecture of bank A, it was back to business as usual in Banks B and GM. You know the sort of thing — take a sample or two, bung it through a filter and envelope, and stick some effects on it. The K5000W brochure claims that Kawai have "developed a totally new library of PCM samples" for the machine, and that may well be the case, but I didn't hear anything that made me sit up and take notice. Having said that, the couple of General MIDI files I played back on the machine (one pop and the other orchestral) sounded absolutely fine.

You must excuse me if the description of the remainder of the sound-generating architecture is a bit perfunctory, but we still have the effects and the sequencer to cover. Each Source used (up to six, either Additive or PCM) has its own coarse (set in intervals) and fine (set in cents) pitch controls, as well as keyboard scaling for pitch (this is most useful to prevent a noise element in the patch from being transposed across the keyboard). Next comes a pitch envelope to add an auto-bend or warp (if required) to the pitch of each source on triggering, useful to imitate the pitch variations in stringed or wind instruments, caused by the actual pluck or the player's embouchure. This is a two-stage envelope covering attack and decay only. Once the pitch has moved through this envelope, it returns to the actual pitch of the triggered key. Positive values for the envelope take the pitch sharp and negative ones flatten it, so by making the attack level one and the decay level the other, it is possible to move the pitch above and below the point at which it starts and ends.

Then comes a more standard filter than the formant one described, just in case you need a machete instead of a surgeon's scalpel. It is, of course, also digital but apes its analogue ancestors rather well, with the choice of high- or low-pass, with resonance and velocity, keyboard scaling and

## AUTO PHRASE GENERATION

Before starting, I must declare my bias as far as this type of feature is concerned. I have never seen the point of this kind of facility unless you have a gig playing standards in a restaurant and need to sequence up a load of songs very quickly, with as little of your own musical personality as possible. I've never even used features like the Interactive Phrase Synthesizer in *Cubase*, and find that keyboards like the Korg i-Series and the Roland E-series make even the most gifted players sound like clones.

However, this facility is becoming increasingly common, even on professional keyboards, so I should nonetheless try to give you some idea of its potential. To use the APG, you first need to record what Kawai refer to as a Seed Track (or designate a track with chords already recorded on it as the Seed Track.) The Seed Track supplies the chord structure for the auto-accompaniment patterns. Once you have designated a chord structure to work from, you can choose a range of styles, from Country and Hawaiian through to Rhumba, Samba and Chachacha. Now I don't know how many of you out there are regularly doing work with these musical styles, but maybe there will be a greater interest in the Hip Hop, Rap or Acid styles. It is a shame that there's no Techno style built in as standard, but it does come on the demo disk. I think this is the style of music which Advanced Additive is best suited to, with its capacity for real harsh, aggressive sounds.

There are over 100 musical styles in ROM, and each style has six variations, which you can switch between in real time; some of them are fairly radical, so much so that they could be regarded as separate styles. For those people who like this sort of thing, that should be plenty to keep them going. I'm just not sure if the people who like this sort of thing will be the same ones who want to use Advanced Additive Synthesis.

The K5000 also comes with a free utility by EMC, called *APG Data Convert*, which loads styles from Technics K-series, Roland E-series, Korg i-series, Gem WX & WS, Solton MS and Wersi Instruments. This seems to be all the leading makes of style-based keyboards, and means that you should never be short of new styles to try.

The other 'compositional aid' (to use the brochure's phrase) the K5000W boasts is the Chord Advice feature; this brings to mind some benign old professor to whom you can go if you are having trouble with your classical compositions. This is actually an algorithm which analyses the harmonic content of the music and suggests alternative chord voicings which would work. It seemed to work well enough, although it always veered towards jazzier chords. Perhaps this was a result of interaction with the style currently selected (although this wasn't mentioned in the otherwise comprehensive documentation).

Again, this wasn't a feature I could see myself (or my concept of a typical SOS reader) using, but I suppose if you are suffering from an episode of writer's block, maybe it could give you a new slant on your song.



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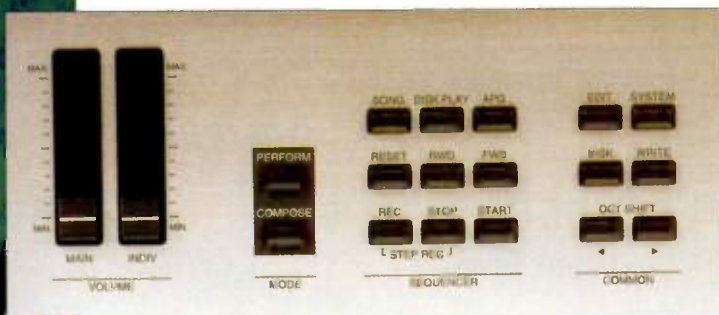


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# Kawai K5000W

- ▶ envelope control. Again, the four-stage envelope features two decay stages, but sadly with no looping this time. The results of this were distinctly ordinary after the formant filtering, but then I guess sometimes you have to eat bread and cheese. (Chamapagne and caviar every day would



get boring.) The final stage in voice editing is the DCA (or digitally controlled amplifier). This can also be modified by key scaling, velocity, or its own dedicated envelope. Again, the envelope has two decay stages as well as Attack and Release.

That covers all the synthesis parameters available within single voice mode. It would be true to say that there are significantly more than on any other synthesizer I have ever used (64 harmonic envelopes per Source, just to start) and there's no doubt that while the display gives you a pretty good clue as to what's going on, and the grouping of harmonics and envelopes provides many shortcuts to sound programming, being able to see and edit all these parameters on a computer screen would be really helpful. Doubtless profiles for the most common editor programs will emerge in due course to allow you to do this.

## COMBI-NING SINGLES

As if the Single, with its potential of six Sources, isn't enough sonic grist to your mill, you can always combine four of them into a Combi. This allows up to 24 sources to be triggered from a single note (although don't expect much polyphony if you decide to push things to this level, as one voice will use 24 of the available 64 voices).

The real reason for using Combis would be for the keyboard-mapping potential (different Singles in different areas of the keyboard or in different velocity ranges). You can set zones up and down the keyboard or in the velocity range to bring

out all sorts of switching or splitting layouts. This is ideal for the live performer who has to cover bass lines and polyphonic parts, or for the more advanced imitation of entire orchestra sections, where you could bring in extra instruments on high velocities. For sequencing, however, you're restricted to using Single patches, because of multitimbral access considerations (see 'Sequencing Potential' box).

## CONCLUSION

The only real problem with the K5000W is that it suffers from a split personality (if references to schizophrenia are not politically incorrect). On one side it features a technology which should really appeal to sound designers looking for inspiration and new ways of approaching things. On the other hand, the styles and auto-accompaniment features (see 'Auto Phrase Generation' box) are more for the domestic built-in speaker market. It seems unlikely to me that there will be too many cross-overs between these two markets. As far as the workstation side of things is concerned, the sequencer is very worthy example of the genre if your sequencing needs are not already taken care of. Whether you need the Auto Phrase Generator and Chord Advice depends on the type of music you're doing and how confident you are in your own musical abilities. My guess is that the K5000S (the synthesizer-only version) is going to be of more interest to SOS readers.

As I sit playing with the K5000W in the back room at Sutekina (just next door to the old Argent's shop in Denmark Street — funny how life goes in cycles, isn't it?), how do all these improvements to the original K5 synthesis architecture add up? Have they brought the concept up to date for the '90s, or made it look even more anachronistic in an age of General MIDI sound-sets and FX-swamped presets? All I can say is that once I started delving into the K5000, I was constantly amazed at how much has been added to the K5 concept in Advanced Additive. Where there were once four envelopes, there are now 64. Where there was once a single sound source, there are now six. If all this isn't enough to allow you to generate complex sounds, add in the ability to blend in PCM sounds, cross-modulate them with AM, and then put them through the four effects. In terms of sound quality, it's every bit as good as the K5, but with so much more flexibility. The real key to the exciting sounds available is the real-time modulation of harmonic content. This means you can use envelopes, LFOs, or even the mod wheel to really bring sounds to life. If you get the chance to try the K5000W, make sure you give the mod wheel a good workout when playing the sounds in the AA bank.

For me, reviewing the K5000 was like revisiting an old girlfriend and finding that she had grown even more beautiful than I remembered. I can't honestly think of anything that Kawai have left out of this stunning synth.

SOS

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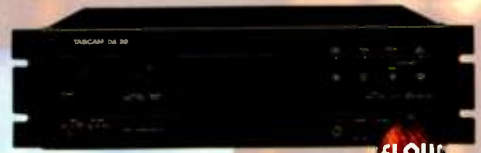
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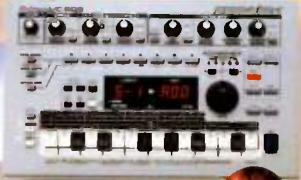
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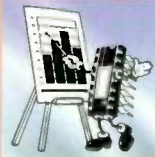
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*Akai's new CD3000XL features the 32-voice polyphony, expansion options, DSP functions and other goodies of the S3000XL, but adds a built-in CD-ROM drive for good measure. PAUL WARD takes it for a spin.*



# MOST XL-ENT!

## AKAI CD3000XL SAMPLER

In 1993, following the success of the S3000, Akai took the important step of releasing the world's first dedicated CD-ROM sampler, the CD3000. The main objective of this machine was to take advantage of the large CD-ROM library that had already built up for the Akai range of samplers. As the CD3000 was to the S3000, so Akai's new CD3000XL builds upon the capabilities of the S3000XL, to become the company's second dedicated CD-ROM sampler with a dedicated quad-speed CD-ROM drive fitted as standard.

### PHYSICAL ATTRIBUTES

The CD3000XL is three rack spaces high, following familiar Akai aesthetics. Over to the far left of the front panel are the shrouded power switch, the CD-ROM drive and the 3.5-inch HD floppy disk drive. To the centre is the 'oh-how-we-wish-it-

were-just-a-little-larger' LCD, with its attendant 'they'd-line-up-if-the-LCD-was-just-a-little-larger' soft keys just below. The contrast of the LCD is adjustable by a control to the far right, the same control doubling up as a push-switch to turn the LCD backlight on and off, to preserve the screen's operating life. Beneath the soft keys are the eight Mode keys that allow you to find your way around the CD3000XL's operating pages.

To the right of the LCD are the data wheel and the cursor navigation keys. Gone, however, is the numeric keypad that appeared on most of Akai's samplers, including the CD3000 and the S3000XL — though I don't greatly mourn its passing. I have rarely used the numeric keys for data input (other than for naming and hitting '9999' for loop hold values) and, having witnessed many other Akai sampler users in action, I'm obviously not alone! It comes as little surprise, then, that the long tradition of using the operating buttons to double up for naming duties has gone by the board too, leaving us





to use the data input knob for the task (although someone ought to tell the guys who write the manual — oops!). I am happy to say that operation does not suffer for either of the above and, indeed, the less cluttered control surface makes for generally quicker operation. The increment/decrement buttons arguably benefit most for their new-found prominence, consequently becoming much more useful tools than before. (These are the controls that step the cursor across the digits of a numeric parameter field, by the way, allowing you to choose the magnitude of change you want to implement.)

To the right of the data wheel are the Record Gain control knob and the Main Volume knob. The Mark and Jump keys, also in this vicinity, mark page positions and jump back to them (strangely enough), the Name key names programs, samples, setups, and so on, and the Enter/Play key is used for data entry and for triggering programs/samples from the front panel when editing. Whilst repeatedly stabbing away at the cursor buttons, I occasionally found myself hankering for the old S1000/S1100's cursor wheel, but that's probably a result of my

familiarity with that system, rather than anything inherently flawed in this one.

The rear panel hosts eight separate polyphonic audio outputs, along with the master left/right, which are all on standard quarter-inch jack sockets. Unusually for Akai, the left audio output, when used in isolation, does not carry a sum of the left and right signals.

I always felt that Akai's CD3000 was hampered by its lack of audio inputs — and digital inputs, for that matter. As soon as I discovered the omission, I crossed it off my shopping list. Maybe I wasn't the only one, because the CD3000XL sports a pair of audio inputs on balanced quarter-inch jack sockets — an adaptor will be necessary for the direct connection of a standard balanced microphone cable. A pair of digital in/out phono connectors is also provided for audio transfer, or for backing up hard disk data to a standard DAT recorder. Little has changed from the S3000XL by way of the sample rates supported at the digital inputs — all is well at 44.1kHz, but the manual still says that the CD3000XL "has difficulty recording at 48kHz" and suggests

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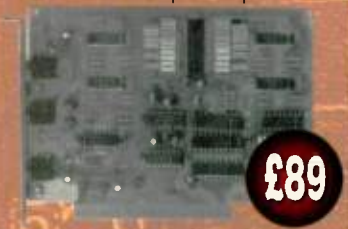
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# AKAI CD3000XL

- ▶ that it is "advisable not to record at 48kHz". This is hardly the type of Yes/No answer that we've become accustomed to in the digital age! My circle of recording friends have a phrase for machines

pedigree. Recording can be set to start automatically as the input level crosses a user-defined threshold, or on receipt of a MIDI note message. In either case, an override feature allows for initiation by pressing

a function key, and recording may also be

terminated before completion. Mono or stereo recording is possible from either the analogue or digital inputs, or from an audio CD placed in the CD-ROM drive. The method of sampling from audio CD is excellent, giving you the best possible chance of getting the job done properly in the smallest possible time. When used in pause mode, audio will begin playback as soon as sampling commences, and the CD will be paused immediately after the sample is

taken. Anyone who has spent any amount of time with a CD player and a sampler will be well aware of the time and heartache that this can save.

However, to every silver lining there is a cloud. The manual warns that data from the CD is actually sampled in its analogue form and that an external CD player with digital output is required for true digital sampling from audio CD! So we have an internal CD-ROM drive, reading digital data at 44.1kHz, that somehow finds it impossible to pass that digital data stream to the internal sampling process. Sigh. I'm sure Akai have their reasons...

Sample trimming and looping functions are all present and correct, together with a time-saving option for automatically trimming around loop points. The left and right portions of stereo samples are handled together seamlessly, although it would be nice to 'see' them as one object on disk or in memory. Zero crossing point searches and crossfade looping help in the fight for the killer loop. But am I the only person who absolutely detests Akai's looping system of 'position' and 'length' (ie. the user defines a point from which the sample is to loop back and then sets the length of the loop)? All I want to do is set a pair of points that act independently — "loop back there, and loop to here". If I wanted the loop-start to shift every time I moved the loop-end point, I'd ask it to! When defining rhythm loops the problem is exacerbated, since you can't move the 'loop-at' parameter back in time if the loop length would push the left-hand loop point back before the sample start. I don't know what advantage Akai believe this 'at/length' system has over left/right loop markers, but since they're sticking with it, might I suggest a 'de-coupling' mode, whereby the loop length automatically adjusts itself to keep the left-hand loop point in place?

Sectional editing permits a portion of an existing sample to be extracted and 'copied' to a new sample name (the original sample is left intact), 'cut' (the sample is 'zeroised' over the selected range) or 'chopped' (the selected range is removed from the sample and the range start and end points are butted together) from an existing sample and given a new sample name. Picking out individual drum



that are unwell, but not quite broken enough to make them of no use at all: "bustish". "The 48kHz digital sampling option is bustish" — yeah, that has a nice ring to it...

A single SCSI socket allows for the connection of external storage devices. Oh, and there's a trio of sockets marked MIDI In, Out and Thru or something...

## COMPATIBILITY

The CD3000XL is compatible with existing library material for the S900, S950, S1000, S1100, the S2000 range, and the S3000 range (including the newer XL models) of samplers. CD-ROMs for other manufacturers' machines can be accessed, although a little tweaking is always necessary when porting samples and programs across this great divide. I tried a couple of Emu disks with no real problems. There's still no support for foreign floppy disk formats, which is a shame. This, coupled with Akai's insistence on perpetuating their proprietary disk format, can make life difficult on occasions. Many's the time I would like to have sent and received Akai samples across the Internet via my PC, but with no support for the DOS disk format (other than for loading MIDI song files) this just isn't possible. I get around the problem by using my Kurzweil K2000 as an intermediary for converting Akai samples to/from WAV format on DOS disks. This is hardly the way it should be done, and I feel that Akai really ought to be addressing such problems by now.

## MEMORY

Eight megabytes of sample RAM is supplied as standard with the CD3000XL. The maximum RAM capacity is 32Mb, by way of standard 72-pin SIMMs. Over and above this, the CD3000XL will also house up to 16Mb of Flash ROM (the S3000XL manages 8Mb). Flash ROM will retain data stored in it between power-ons, making this sampler much more like a contemporary sample-based synthesizer with customisable waveforms.

## SAMPLING

Sampling with the CD3000XL is as simple as we've come to expect from a machine of the Akai

**pros & cons**

**AKAI CD3000XL £2299**

**pros**

- Speed and convenience of CD-ROM coupled with the flexibility of disk setups.
- Vast world-wide library support.
- Good range of tried and trusted upgrade options.
- SMF playback.

**cons**

- No onboard effects as standard.
- Still no support for foreign floppy disk formats.

**summary**

Couples the best aspects of CD-ROM with a very flexible way of customising that data with floppy disk-based Setups — a winning combination. The analogue and digital sampling inputs also make the CD3000XL a true sampler, and all the best aspects of Akai's samplers are in here. But for a machine with such excellent stand-alone production capabilities, you'd be hard put to come up with a reason for not installing the EB16 effects board — if you decide that the CD3000XL is for you, I'd strongly advise you to add it to your shopping list.

**SOUND ON SOUND**



beats from a rhythm loop is an enjoyable experience, and removing sniffs and wheezes from a section of vocals is child's play. Various other editing options are available, including all the splicing, dicing, joining and fading that your heart could desire. If the CD3000XL can't make something of your sample, you perhaps ought to ask yourself whether it's worth keeping anyway! Volume normalising is included, so you can be sure that you're making the most of your sampler's bit resolution, and besides the instant editing features, Akai also provide a smattering of off-line DSP functions, namely time-stretching, resampling, and equalisation.

### SINGLE/MULTI MODE

Once your samples have undergone their digital make-over, it's time to place them in a program for presentation to the world at large.

Akai, to their credit, have retained 'Single' program mode, with its accompanying Mix page, to enhance compatibility with their older models. For myself, I'd be quite happy to re-organise my old disk volumes to make use of Multi mode, which has considerable advantages. Akai helpfully point out the pros and cons of both methods of working, and I'm happy to see them offer this kind of information to give users an informed choice. I'm disappointed that the number of multi slots hasn't been increased from the S3000XL, though. If, like me, you prefer to keep your drum sounds in individual programs, you're out of slots by the time you've reached the cowbell! Once you have a multi-mode configuration that you're happy with, you can name it and hive it off to disk.

Each Program is free to take full advantage of the CD3000XL's vast armoury of synth processing features. I won't go over these again here, but suffice it to say that they are pretty much identical to those of the S3000XL (See *Sound On Sound* December 1995 for my full review of the S3000XL). Of particular note is the resonant 12dB/octave low-pass

filter, which is very musical, if a tad lacking in aggression for some uses. The optional IB304F filter board will give you the capability of producing a 24dB/octave cutoff slope if you really require it.

### GLOBAL MODE

Global mode takes care of tuning, basic MIDI channel selection, DAT backup facilities, the SMF (Standard MIDI File) playback feature, and the direct-to-disk recording pages. On the tuning page, there's now also a setting for the overall output level of the instrument, with adjustment between -18dB and +18dB, in 6dB steps to match your mixer's ideal signal level. Other manufacturers please take note!

SMFs (Standard MIDI Files) are supported for playback, providing they arrive in the floppy drive on DOS-compatible disk. The files can be in format 0 or 1, and up to 50 songs of 999 bars or less are allowed in memory at any one time, subject to a 300K memory limit. Unfortunately, there's no way to save the SMFs to another connected storage device (such as Flash ROM), which would probably be more convenient for stage use.

Direct-to-disk recording is achieved at the cost of six of the CD3000XL's voices, reducing polyphony to 26 notes. Only one 'take' may be played back at any point, so crossfades are unfortunately not possible, but normal sampler functions are unaffected — even during recording. Recording a take is similar in many ways to recording a normal sample, with the process initiated manually, from input threshold, a MIDI note message (with or without definable delay offset) or a MIDI Song Start command. The recording source may be analogue or digital.


Once safely recorded, takes can be edited, copied and named. On playback, takes may be processed by the optional effects units (if fitted) and assigned to appear at any individual output. Advanced take parameters include panning, level and fade in/out times. A 'Song' list allows takes to be compiled for sequential playback or MIDI triggering, with the ability to repeat steps, insert new steps, or delete unwanted ones. Songs may be named and saved to disk much as any other RAM object, and takes can be backed up to DAT to free up valuable hard disk space for further recording.

### LOAD AND SAVE

Load mode permits data to be loaded into the CD3000XL from any of its attached storage devices. When loading from a partitioned device, such as hard disk or the CD-ROM drive, the loading display can be switched to show a list of volume names, which is a nice touch. The Find command

### FEATURES


- 32-note polyphony.
- 8Mb of sample RAM, expandable to 32Mb.
- Built-in quad-speed CD-ROM drive.
- Stereo outputs plus eight assignable individual outputs.
- Stereo sampling from audio CD, analogue inputs, or S/PDIF digital inputs.
- DSP functions, including time-stretching, resampling and digital EQ.
- 12dB/octave resonant low-pass filter.
- SMF capability.
- S/PDIF DAT backup and real-time output.
- Upgrade options include up to 16Mb of Flash ROM, 4-channel multi-effects processor and additional filter card.



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# AKAI CD3000XL

► offers a simple or partial name search within the current partition. Objects held within a partition on hard or magneto-optical disk may also be tagged with a category, such as 'Bass', or 'Favourite', for easier retrieval. Happily, once a program is tagged, the CD3000XL will ensure that, on loading, its associated samples are loaded in too. The tagging system is obviously a powerful way to keep disk data in a manageable form, and could save considerable time.

Saving samples and programs is familiar territory to any seasoned Akai user, as is the inability to save single samples across more than one floppy disk. Come on, Akai, it's about time we cracked this one! After all, floppy disks remain a good back-line defence in making sure that important data is not lost.

## SETUPS

One of the problems with CD-ROM is that you can't edit the sounds and re-save them, except to another storage device. Akai have an ingenious way around this problem that was first introduced with the CD3000. Basically, you can make edits to samples and then save a small file to floppy disk that details the changes, rather than the sample data itself. These files of changes are known as 'Setups'. When reloaded from floppy, these Setup files will load in the relevant CD-ROM data and apply your changes. Setups can even be activated from MIDI program changes. Brilliantly simple. As a long-time CD-ROM Luddite, I have to say that this system did manage to convince me, once I'd seen it in action for myself. It's important to note that Setups can only be defined for CD-ROM discs that have been named. Although all the Akai discs I tried were named, I did find one third-party disc that wasn't. Owners would be wise to check this out before buying discs.

## OPTIONS

I've already mentioned some of the optional upgrades that can be added, including the Flash ROM and the IB304F filter board. I would recommend that anyone looking at the CD3000XL as a production tool consider the EB16 multi-effects board as a near-essential purchase. Having used this board in an S3000XL, I can attest to its quality and to the way it integrates with the sampler's operating environment, particularly in multi mode. The machine I had for review here didn't include the EB16, but after scanning the manual, I have little doubt that its use is much the same as in the S3000XL.

## BUNDLED BITS & PIECES

Once again, Akai supply the MESA Macintosh editing software to unlock the power of the CD3000XL with a computer-based editor. And once again I feel that those of us with PCs and Ataris are being sold short. How long must we wait for other versions of MESA to appear?

The accompanying manual is generally very good. Other manufacturers could learn a lot from reading this! Everything from the theory of

sampling to installing the upgrade options is covered in detail, in a friendly, conversational manner. There are one or two mistakes, most notably the description of how to use the function and soft keys for entering text, a procedure which has not been implemented on the CD3000XL! But most of these are minor and certainly won't cause any serious difficulties. My only real gripe is that there is no index.

## CONCLUSION

I have never been disappointed by an Akai sampler, and that record stands unbroken. The beauty of the 'Setup' approach, as mentioned above, is that it removes the inflexibility of CD-ROM-based data — something which has made me deeply wary of the format until now. The fact that, unlike the original CD3000, Akai have included sampling inputs on this new machine means that budding samplers can begin with a CD3000XL, make use of the burgeoning CD-ROM sample libraries out there, and then get into true sampling without having to sell it and buy a machine with inputs. I'm still uncomfortable about the perpetuation of Akai's proprietary disk format, making sample acquisition from the Internet an awkward prospect. There also seems to be a lot of button-pushing going on for some of the simplest jobs, but the CD3000XL is far from being the worst offender in this respect.

In terms of competition, the CD3000XL's closest rival in this price range is likely to be found in Emu's E64. The Emu offers 64-voice polyphony and more sophisticated real-time processing, but only comes with 2Mb of sample RAM as standard, has no internal CD-ROM drive, and lacks the CD3000XL's direct-to-disk recording facility.

This review, by necessity, has really only skimmed the surface of the CD3000XL's powers. Here is a superb sampler, with all the editing and synthesis facilities that we've come to expect from Akai. The various optional upgrades are commendable and worthwhile, particularly, I feel, the EB16 effects board. The bottom line is that you can take the basic machine and bend it to your personal requirements and budget. If you are considering buying a digital synthesizer, with a view to checking out a sampler later, this machine might be a better alternative. If you're specifically looking for a sampler, you really should try to spend some time with the CD3000XL before you make a choice — I think you'll be impressed.

Buy it, love it, then let me borrow it.

SOS

"If the CD3000XL can't make something of your sample, you perhaps ought to ask yourself whether it's worth keeping anyway!"

## BUNDLED CD-ROMS

The four CD-ROMs that come bundled in the box are packed with good, solid sounds that alone would provide enough material for a lifetime's happy recording. These discs comprise the S1000/S1100 sound library, the S3000/S3000XL sound library, a whole disc of rhythm loops and a truly excellent disc full of drum sounds. This latter disc I really can't praise enough for its sheer quality and diversity. Any of these discs would be worth paying extra money for — that Akai UK have seen fit to bundle them with the machine is good news indeed.

**E** CD3000XL £2299; EB16 effects board £399; IB304F filter board £349; Flash ROM (8Mb) £649. Prices include VAT.

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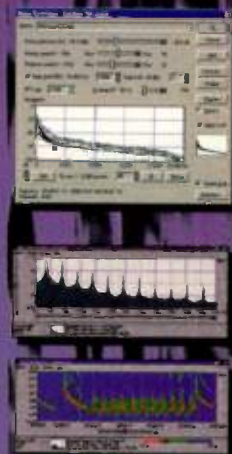
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Sample Material is a sonic collage from the sound libraries of visionary New York producer Bill Laswell and the 'Material' cadre containing Loops, Textures, Riffs, and Single Sounds. Atmospheric Ambiances, TranceScapes, Ethnic Loops & Riffs. Metafied Grooves & Kaos. A Sampling Product covering the broadest spectrum of musical genres. Ammunition for all Sonic Wizards who want to create music with no boundaries. REVIEW: "World grooves, basses and guitar loops, clavinetts, synth effects, kicks, snares and ambient washes to back any atmospheric composition... It's all here to some degree... Good sounds" (Future Music, UK). Audio CD £59.95. AKAI CD-ROM £149.00

**DOUBLE PLATINUM DRUMS**  
Multi-Platinum record winners, producer John Boylan and drummer Michael Botts have put together one of the smartest, most tightly assembled collections of live drum loops to date. Phenomenally well-recorded and mixed in true stereo with the same high quality you expect from platinum records. These acoustic kits are played with raw, rockin' energy and plenty of feel. Loops & hits. Dry & Room. Intros, fills & ends for assembling complete tracks! Audio CD 2-disc set: £79.95. CD-ROM 2-disc set for Akai, Roland or SampleCell: £199.00

**ALI-BA-BA & THE FORTY RAVERS**  
The Orient offers a massive range of beautiful instruments and percussion that can be used in many styles of music, and this new library captures just about all of them from Tunisia, Iran, Iraq and Turkey! Hot off the press, this double CD contains phrases, individual notes and hits of instruments, percussion, turkish orchestras, moving atmospheres and oriental choirs. Double Audio CD: £59.95

**BURNING GROOVES**  
Devoted to raw, aggressive, in-your-face energy! Blazing, all-original live drum grooves by Abe Laboriel Jr. (drummer for Seal) with extreme remixes by producer Eric Persing (who brought you Bass Legends & Distorted Reality). Unrelenting alternative, power funk, progressive soul, rock'n'roll and grungehead loops in a wide variety of tempos put this collection in a class by itself. Each groove has a unique mix (edge, ambient, distorted, lo-fi etc) and some have Hi-Fi and Lo-fi re-mixes. Grooves also played without kick/snare for flexibility in customizing loops. CD-ROM version includes the Audio CD for instant auditioning, plus the incredible SMOKIN' KITS drum library. Attitude! Audio CD: £59.95. CD-ROM (includes the audio CD): £149.00

**NEW WORLD ORDER 1 & 2**  
Journey # 1: Fantastic Collection of Ethnic & Percussion loops, Tribal Rhythms, Ritual, Djembe, Talking Drums, Calypso, Reggae, Haitian Vodoo, Afro-Cuban, Latin Funk, Tabla Loops, Indian Ensemble, Rhythms from Japan, Ireland, Texas & New Orleans. Journey # 2: Extensive performances on a multitude of acoustic instruments from all over the World. Loads of seldom heard Folk/Historical instruments, plus vocals. Loops, Riffs, Slides, Chords, Scales etc. All sounds are original recordings. Audio CDs: £59.95 each. CD-ROM (Akai): £149 each.

**SYNCLAVIER LIBRARY (AUDIO)**  
The five-CD-ROM Synclavier Library from Ilio (USA) has been compiled into two audio CDs containing over 2000 samples. VOLUME 1: "ESSENTIAL" covers Electric and Acoustic Guitars, Electric Pianos, Synths, and Drums & Percussion. VOLUME 2: "ORCHESTRAL" covers Strings, Harp, Brass and Woodwinds, Grand Piano, Orchestral Percussion including Timpani, Bells, Chimes, Songs and more! Accompanying manual gives loop points for every sample so it's extremely easy to loop samples quickly and effectively. Each CD: £69.95

**TOTAL CONTROL REALTIME FILTER**  
The worlds first sample CD with realtime-filtered & arpeggio-ed analogue sounds. Total Control makes a brand new analogue synth out of your sampler with 4500 spanking new sounds, fractal loops & inspiration sets, all on a mixed-mode double CD-ROM including a 500 megabyte Akai section!! Mixed-mode Audio/Akai double CD: £59.95

**SUPREME BEATS**  
The most comprehensive library of percussion grooves & instruments ever developed, featuring percussionists from all over the world. This highly acclaimed library is now available on 2 CD-ROMs: 1: AFRICAN/CONTEMPORARY, & 2: WORLD/DANCE. "A feast of human feel, energy & emotion... a knockout... Supreme Beats is a winner. 20 stars out of 20." (Keyboard, USA). African/Contemporary CD-ROM: £149.00. World/Dance CD-ROM: £149.00. Audio CDs 1 to 4 (boxed set): £199.00. Audio CD 5 (NEW!): £59.95. (CD-ROM versions include all the sounds from Vols 1-5 audio CDs).

**ON A JAZZ TIP**  
This is Hip Hop In Full Swing! This superb release from Swedish developer Sounds Good features stomping grooves, licks and loops, played in pre-determined keys and tempos to be used inter-actively. Includes Bass, Guitar, Keys, Horns, Drums and Percussion, Jazz pads, riffs and chords. Perfect for all HipHop, Rap, Soul, TriPHop, Acid Jazz and Funky flavors. "On a Jazz Tip" is ideal for any music project that needs a sting, swing or that Jazz Thing. Produced and played by musicians who love and respect music. Audio CD: £59.95

**LOOPZILLA 2**  
Features over 2 hours of Hiphop, R&B, and Funk samples, on 2 CDs. The very latest grooves and construction kits for making funky, soulful music in the R&B and Hip Hop traditions. Reflecting the growth of these styles, Loopzilla 2 combines the best elements of programmed grooves & live playing with new melodic & hook elements destined to be the hallmark of new trends. Breakbeats, Guitar, Bass, Analog & Digital Synth loops, Horn Hits, Silky Vocal Harmonies & Pop Hooks combined in Slow Jams, R & B & Hip Hop from the Atlanta, Miami, New York, Oakland and "So Cal" schools of Hip Hop, Funk and R&B. Audio 2-CD set: £69.95

**LOOPMATIC**  
A superb new sampling tool specifically designed to provide a fast and flexible working environment for analog sweeps, effect loops, digital sweeps, RND loops & drum sweeps. Each sound was sampled with it's filter cutoff set at 32 different levels, so there's thousands of ways of using them, from creating smooth sweep effects to random bleepy sequences. 320 different sounds are included on this mixed-mode Audio/Akai CD, containing an Akai CD-ROM section with over 10,000 samples!! £59.95

**HEART OF AFRICA VOLUME 2**  
Following the success of Heart of Asia, the equally unique sequel is a smash hit. The library comes in two parts. Volume 2 (shown) features all-new tribal phrases, vocals, performances and effects, mostly recorded at a huge tribal competition in Kenya. This material is very primitive & really enhances the volume 1 samples. "Heart of Africa" is heartily recommended to anyone seeking beautifully recorded authentic ethnic sounds & rhythms, and complements "Heart of Asia" perfectly. Volume 2 audio CD: £59.95 CD-ROM: £149. [Volume 1 audio 2-CD set: £79.95, CD-ROM: £199.00]

**EUROTECH**  
☆☆☆☆☆ 5 stars... A hit release! (Sound on Sound magazine). "Eurotech" specialises in Euro-dance and Euro-pop. This style of music has dominated the charts all over Europe over the last few years & seems set to continue. A very commercially attractive set of sounds, and all original. The loops are fast (192 of them are over 140bpm!). A nice balance of the experimental & straight. All bpm's are given. This is a hot & hard techno resource. Audio CD: £59.95. AKAI CD-ROM: Now only £99.00

**DRUM DOCTOR 2**  
With over 1500 new samples, Ross Garfield (known as the "Drum Doctor") has raised the standard even higher for this sequel to "The best drums on Earth". It features even better sounds, more takes per instrument, 5 dynamic levels and more performance patches. Like vol.1, it includes General MIDI Kits, High and Low Memory Configurations, Dynamic Articulations, Creative Filtering etc. The finest instruments from the 100 drum kit studio collection of Ross Garfield - Drum Doctor for the world's top studio drummers. When the stars need great drums for a session - they call the Drum Doctor! Audio CD: £69.95. CD-ROM: £199.

**ALPHADANCE II**  
A twin-CD pack featuring 90 minutes of audio and a 300-Megabyte CD-ROM section - all for only £59.95. • House & techno organs. • Strings. • Sequencer lines. • Combination Pads. • Attack Banks. • Vocals. • Acoustic • Percussion Loops & Drumloops. • Rave Basses (multisampled, with short demos). • Dirty Loops. • Lead & Hook Synths. • Transformer sounds. • Synth Drums. The CD-ROM section has everything mapped in keygroups, ready looped, ready for takeoff. 2 CD set including 300Mb Akai CD-ROM. £59.95

**HEART OF ASIA**  
This product got a 5 star review in every magazine in UK, US & Germany! The most comprehensive collection of Asian instruments & phrases. This remarkable 2-disc set includes over 16b of exotic Chinese, Malay, Nepalese, Tibetan Javanese, Hindi, Sanskrit, Mandarin, Thai & Indian samples, including instruments, phrases, opera divas, chants, speech, gamelan orchestra, monks. Perfect for your next film score, album or remix project. "A treasure chest of lovingly sampled performances." (Keyboard, USA). "The range and subtlety is faultless. You won't find a better collection of ethnic sounds anywhere else." (Future Music, UK) Audio 2-CD set: £79.95. CD-ROM 2CD set: £299.00

**METHODS OF MAYHEM**  
Brutal & sweet sampling for Industrial/Intelligent Techno, Goth Techno or anything in need of an Experimental Edge. Uniquely twisted, bizarre and savage stuff. Drum-, Bass-, Synth-, FX-, Vocoder-, Feedback- & Noise-loops. Grinding Guitar Riffs & Feedback. An Analog Heaven with Synth FXs, Sweeps, Zaps, Basses, Drum & Perc Sounds etc. All programmed on vintage equipment and treated without any mercy. Creepy & Cheesy Sound FX, Music FX & Voices. Over 1000 samples. A unique collection. Loops are in set tempos that match other Sounds Good titles. Audio CD: £59.95

**MEGATON BOMB**  
This dance collection got a five star review in KEYBOARD mag (USA) - "An almost ridiculously complete 2-CD package of loops, drum hits and other assorted goodies - everything from construction kits containing multi-layered arrangements to drop-the-needle turntable noise, from TB303 Bass riffs to Sci-fi dialogue. If they let us give 6 stars for selection, this package would have scored even better." (Keyboard USA). Features ambient, hardcore, trance and techno on a 2 disc set. £69.95

**GROOVE BOX**  
ONLY £19.95 when you purchase another Time+Space CD at the same time! (NOT AVAILABLE SEPARATELY). Over 2500 sounds and grooves from the amazing NEW Roland MC303 groove machine. GROOVE BOX includes dozens of Construction Sets, 100's of loops and of course all the famous single instrument sounds - TR808, TR909, CR78, etc etc If you buy ANY product featured in our catalogue then you can get "GROOVE BOX" for only £19.95.

**DISTORTED REALITY**  
And now for something completely different... Cutting Edge Textures, FX and Loops from the labs of top Hollywood sound designers and techno-heads. From 3-dimensional atmos transformed via Harmonic Sound Morphing, to incendiary fuzz mutations, Trance-inducing ambiances, loops, enormous modular drones and astonishing timbral contortions - an essential resource for the producer, composer, or sound designer in search of the magic noise. "If you're making any kind of edge music, this is a library YOU MUST HEAR... gorgeous curtains of sound... will get your listeners' blood pumping... For the progressively minded this disc is a feast. 5 stars out of 5 in every category" (Keyboard, USA). A spine-tingling sample collection, and about as unique as you can get. Audio CD: £59.95. CD-ROM: £149.00

**SAMPLING SOUND SYSTEM**  
A new series of smaller multi-format libraries from Sounds Good in Sweden. Each disc in the series is mixed-mode Audio / PC WAV / Mac AIFF. £19.95 each, with Akai CD-ROM versions at £39.95 each. Titles include Drum Tools (Laidback, Brushed, & Popped), Country, Roots Reggae, G-Soul, House, and more! Loops are in set tempos that match other Sounds Good titles! Call for more details and ask for our free multimedia product catalogue!

**SYMPHONIC ADVENTURES**  
This versatile orchestral phrase/sting library is perfect for film composers or for any music that needs powerful stings, effects, phrases, suspense, moods, etc. A huge set of immaculately performed and recorded stereo samples. A top-class orchestra and a famous composer, dedicated almost entirely to the darker side of the orchestra. "Intelligent arrangements and orchestrations give this CD an utterly convincing big-budget movie feel. The depth of instrumental emotion is astounding. Made to measure for Batman 4 or the next Predator movie. Highly respectable and awe-inspiring." (Sound on Sound, UK). Audio CD: £69.95. CD-ROM: £199



### E-Lab (Sweden)



**X-STATIC GOLDMINE 4**  
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**X-FILES OF HOUSE**  
Hot new CD from E-LAB - a new goldmine of Deep & Progressive House loops & samples. To give you an idea, the loops and samples are in the style and mood of Armand van Helden, Todd Terry, or Deep Dish. These loops & samples will make your Hair Stand Out - pure joy! You won't be able to stop moving your feet when you hear this one. All percussion provided with variations so you can create your own deep house tune instantly - perfect for injecting The New York club sound into your music - the sound of people like "Masters at Work". OVER 1000 PHAT LOOPS AND SAMPLES. Audio CD: £59.95



**STRICTLY 12-INCH**  
Important new CD from E-Lab. Features Dance/Remix/House LOOPS & DRUMS. WHAT VINYLISTICS IS FOR HIPHOP, THIS CD IS FOR DANCE. The idea is similar: Loops, with variations, together with separate hits. A Remix CD for anyone in the need for good stomping House & Garage Loops. Very much "DJ sounding", & produced by a Remix/DJ team. If you want the sound of the dancefloor - get this one. All Loops have been tested for reaction on the floor! Audio CD: £59.95



**RIDDIM ON FIRE**  
WC Music Research have done it again! Features: •200 Acoustic Drum and Rema Loops. •250 Electric Bass Loops. •200 Dancehall Loops. •75 Bass and Drum Loops combined. •Drums, Bass, Vocal Hooks •200 MIDI Files. •200 DNA Grooves in Cakewalk, Cubase, Logic, Performer and Vision formats. Recorded in Jamaica to get that round, nasty bass and the raw, pulsating riddim. This CD is destined to uphold the great tradition of Reggae DrumSplash, only now you're getting the other half of the riddim wins!! A masterpiece! Release scheduled for late 1996. Audio CD: £59.95

### U.S.B. (France)



**PITBULL JUNGLE LOOPS**  
New from Universal Sound Bank in France, a huge collection of original Drum'n'Bass, Hardcore and Intelligent. Enormous and Extreme loops for producers of Jungle. Also individual drum samples for customizing loops and adding fills etc. Loops grouped by tempo, in increments of 5 BPM from 150 BPM to 170 BPM, for easy mixing & matching. The CD-ROM version comes with the Audio CD version for easy auditioning and includes Temp'n Key™ programs that give you all the loops at 26 different tempos. The only Jungle library available on CD-ROM. Audio CD: £59.95. CD-ROM: £149.00



**DEF HOUSE**  
A fresh new collection of House, Tribal and Garage loops from Universal Sound Bank in France. Over 1000 loops and samples including loops in up to 31 tempos, from 110 to 140 BPM. Also features a host of bass and percussion sounds to complete the bottom end of your track. The sounds are bang up to date - exactly what's needed to create dance music that will keep the party moving! Available NOW in four formats: Audio CD: £59.95, or choose a CD-ROM for Akai, Roland, or Ensoniq samplers - £149.00.



**MEDITERRANEAN INSTRUMENTS**  
Another new release from USB in France, drawing upon the rich and emotive tradition of Greek and Turkish folk instruments - Bouzouki, Electric Bouzouki, Baglamas, Tzouras, Oud, Saz & Jubs. Includes phrases and sets of multitracks. Very professionally recorded and organised. Also percussion loops. This collection is truly a unique source of inspiration. Audio CD: £59.95. CD-ROM 2-disc set: £199.00



**PERCUSSION SLAM**  
Hot new disc from Invasion (USA), comes with loops, samples and standard MIDI-files. Multiple layers of percussion instruments were played live and the MIDI-files were created directly from the loops. Killer material for Dance, Pop, Latin, R&B, HipHop, etc. Enhanced construction kit format includes: multiple tempos of each groove, alternate instrument mixes, fills, MIDI-files & samples. Gives you the power to quickly create and modify tracks. Performed by Rafael Padilla and meticulously recorded at Mama Jo's Studios. Audio CD: £59.95 Akai CD-ROM: £149.00

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  - Cranes Music, 5A High Street.
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  - Intasound, 70 Warborough Road.
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The result is understandably a superb range of sample collections of the highest calibre and with the maximum range of application and variety of content. Price-per-sample works out the same as full-size CDs. You should find that your local dealer stocks the whole range! £19.95 each

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### Major Web Site Update

In case you hadn't noticed, the Time+Space internet site has been totally revamped and updated and will now be updated frequently with all the latest news.

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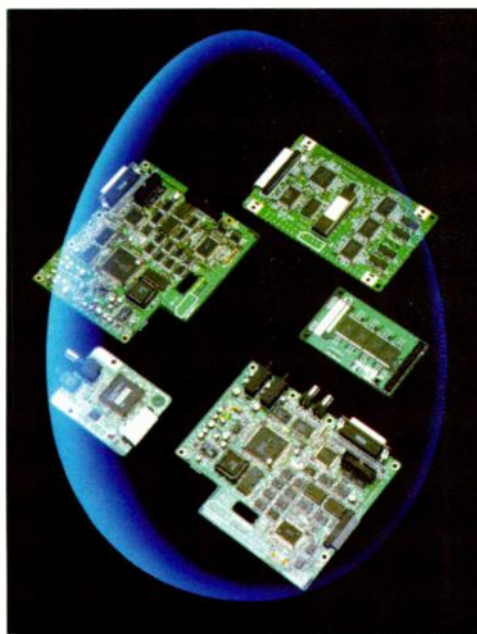




# Expanding Universe

## KORG TRINITY EXPANSION OPTIONS

*When the Korg Trinity was launched more than a year ago, the list of expansions it would be able to host seemed too good to be true. Now they're all finally available, PAUL WIFFEN takes stock of the options.*



In the 'All Things To All Men' stakes, the Korg Trinity series (reviewed SOS December '95/January '96) appears to have more bases covered than most of its rival workstation products. Even in its basic form, it offers a great breadth of timbres and more DSP effects horsepower than anything else on the market. But once you start adding options, it seems there's very little it can't do — including physical modelling synthesis, loading of user samples, hard disk recording, and digital interfacing (ADAT and SCSI formats).

Each of these options in itself is nothing new. The Solo board's physical modelling technique has been available for over a year, as the incredibly successful Prophecy synth. Synths as varied as the Yamaha SY85 and the Kurzweil K2000 have been able to add computer memory to load samples into, and the Ensoniq ASR10 had a software update a few years back which added hard disk recording to its capabilities. The first synth to feature the ADAT digital interface was the Alesis Quadrasynth.

What is unique about the Trinity concept is that

all of these things can be crammed into one keyboard. This makes a fully-expanded Trinity prime candidate for the one luxury item a modern musician might choose to take to his desert island. But in the real world, does it make sense to keep all your eggs in one basket? Let's take a look at each option in turn and see how it stacks up against dedicated devices doing the same sort of job.

### PROPHECY SOLO BOARD OPTION

The Prophecy from which this board is taken is a completely unique synth, both in terms of the breadth of sounds it can produce and the way it has of grabbing your attention, whatever else is going on in a piece of music. In terms of 'analogue' timbres, I consider it the best-sounding monophonic synth since the greats of the '70s and '80s, and the only thing still in production which can hold a candle to them. But its physical modelling capabilities don't stop there, with a combination of real-world sounds which are second only to the real thing, from bass guitars to saxes.

The set of Programs you get with the SOLO-TRI option (which come up as Bank 5) includes not only the original Prophecy patches, but also all those on the two PCMCIA cards which have recently appeared for it. This makes it seem even better value for its £475 price tag. I also found it a lot easier to navigate around the sounds available using Trinity's display (I always seem to get lost with the two button-pushes required to select a new Program on the Prophecy). In terms of sound, the SOLO-TRI has exactly the same character and warmth as the Prophecy, and it's just a shame that you can't add a couple more SOLO-TRI boards, so that you could have several Prophecy sounds within your sequences.

I can't think of any reason a Trinity owner wouldn't want to add this palette of sounds to their arsenal, unless they want to remain a shrinking violet and stay out of the limelight forever. You might not be able to strap the Trinity around your neck and get out there and pose (like you can with the Prophecy), but no-one will be able to ignore you with this set of attention-grabbing sounds coming out of your Trinity.

### PLAYBACK SAMPLER/FLASH ROM OPTION

The PBS-TRI Playback Sampler/Flash ROM Option (apart from being a bit of a mouthful) gives you the ability to bring the world of sampled sounds into the Trinity, and mix and merge them with your synthesis. It also means that you don't lose your new 'best-of-both-worlds' programs when you switch off. Ever since the Yamaha SY99 let me load

**pros & cons**

**SOLO-TRI OPTION £475**

**pros**

- Sounds every bit as good as the Prophecy for half the price.
- Trinity becomes a great monosynth as well as a great polysynth.
- Longer keyboard saves stepping up and down octaves all the time.

**cons**

- Does not have Prophecy's real-time controls or arpeggiator

**summary**

No Trinity owner should be without this board (unless they already own a Prophecy, of course); it increases the expressivity of the Trinity tenfold.

**SOUND ON SOUND**



SOLO-TRI option.





a TX16W sample library and use it in combination with synthesis, I have been convinced of the flexibility of samples + synthesis, but it is a tedious business having to reload your efforts every time you switch on. Fortunately on the Trinity option, the ability to load samples from disk is combined with the elephantine nature of Flash ROM (it never forgets), so you can get the samples in quickly and keep them on power-down. This means that it really does seem worthwhile to create interesting synth patches out of sampled sounds, as they will always be at your fingertips. Of course, the problem with Flash ROM is that it does seem rather expensive these days compared with RAM, which is currently being given away with cornflakes. The PBS-TRI option gives you 8Mb to play with for £625. This is about five times what you would expect to pay for SIMMs, but after a power cut on stage, I think you would come to appreciate the advantages of the extra expense.

This option also doubles the number of Programs, Combis and Drum Kits which can be stored in the Trinity. This gives you Banks C and D for both PCM Programs and Combis (for a total of 512 of each), and if a SOLO board is fitted, doubles the number of programs available for Prophecy sounds to 128. The file structure allows 500 samples (of which 200 can be drum samples) and 100 multisamples to be held in memory.

Samples can be loaded from disk in Korg, Akai and AIFF on DOS formats. This gives you access to a fairly large source library, but it would be nice if

other formats, like the excellent Roland and Emu libraries, were available as well, as on the excellent Kurzweil K2000. Maybe a future software update will add access to other libraries as well (after all, the Kurzweil didn't read everything when it first came out). Multi-samples can also be read from Korg and Akai disks, so the key-mapping of several sounds across the keyboard to make up an instrument does not have to be recreated from scratch, but not all the other parameters of the Akai programs will be interpreted. For example, velocity-switched or crossfaded samples in a Keygroup will all be assigned to the key ranges they occupy in the Akai, but without the crossfades between Keygroups (not too much of a hardship, as few Akai programs use this feature).

If the samples you're loading are not already associated with a multi-sample, you can create your own. Each sample has its own Tune, Level, Top Key and Original Key parameters (the lowest key being set by the top key of the sample below). Alternatively you can use a Drum Kit to organise samples together into suitable groups for use. Once a multi-sample has been created, it can be used as the source instrument for a synthesis program, just like any other.

Obviously, 8Mb is not a huge amount of memory by today's standards, when 32Mb is common in many samplers (and some can be expanded to 128Mb). However, it's worth the work that is often needed to reduce the amount of memory a multi-sample takes up (by reducing the loop length and

## pros & cons

### PBS/TRI OPTION £625

#### pros

- Adds user samples to the Trinity's rich synthesis palette.
- Reads Akai and AIFF formats as well as Korg's own disks.
- Doubles the Trinity's Program and Drum Kit capacity.
- Retains samples and programs on power-down.

#### cons

- No editing of sample size possible on the Trinity.
- Flash ROM is much more expensive than the SIMMs equivalent.
- Not all Akai parameters are read.
- Libraries other than Akai are not currently supported.
- Cannot save audio files across two floppy disks.

#### summary

Using samples as source waveforms is one of the best ways of increasing the scope of sounds a synth can produce. Although somewhat more expensive, doing this via Flash ROM means that once a good set of samples has been loaded and programs created using them, they are as permanent as any of the original sounds in the machine. This makes an excellent way of customising a synth, especially for use in a live situation.

**SOUND ON SOUND**



# Korg Trinity Expansion Options

- ▶ the time before the loop starts, stretching the range a sample has to cover and so on) because of the Flash ROM, which saves the need for continuous reloading. By judicious editing of samples before they're loaded into the PBS-TRI option, you can increase the number of sounds available.

Unfortunately, there are no parameters for editing size or loop points on the Trinity itself, so the only way you will be able to squeeze more samples into the available space is if you have an Akai sampler or Macintosh/PC on which you can edit the samples before you send them across. Korg have already produced four sets of 8Mb banks that fit the maximum number of samples into the available space, and these were also supplied with the review machine. I particularly liked the first two of these — the Mega Pianos and the Orchestral bank.

I've always liked Korg digital piano products, and the TBS1S Mega Pianos bank is definitely in the same league as their dedicated digital pianos. Similarly, I found the TBS2S Orchestral bank a delight for sequencing up the classics. TBS3S is the Dance bank, and sounds every bit as unmusical and abrasive as the sounds I hear whenever I am exposed to the phenomenon known as Dance — so I assume that this makes them ideal for those working in this genre! TBS4S is the original complete M1 set of sounds, and though I cannot imagine why anyone would want to regress a Trinity to sound as primitive as an M1, they sound 100% authentic to my ears.

The new Version 2 software for the Trinity adds the ability to read S3000-format disks as well as the original format, S1000 (which is what people usually understand by Akai format). While most of the library material published in floppy or CD-ROM format is S1000 format, so that it's compatible with as many devices as possible, if you're exchanging sounds with a friend with a recent Akai sampler, the disks s/he will give you will be in S3000 format, so the additional compatibility you get in version 2 software is a real bonus. It also allows you to read Akai CD-ROMs in both formats, provided you have either the HDR-TRI or SCSI-TRI options fitted as well (see box for a list of the other features in version 2).

Overall, the PBS-TRI works really well, and as long as the £625 price point doesn't overstretch your budget you'll really appreciate the fact that the samples are not lost when you power down.

The only real problem I experienced with the PBS-TRI option was when loading an 8-bit AIFF file that filled an entire floppy. The Trinity loaded it fine, because it automatically converts the data to 16-bit format, but when I came to save it back to disk it was too large to fit on a floppy. Unfortunately, Trinity is just like the Akai samplers: it cannot split an audio file across two floppy disks. However, the remaining two options for the Trinity can get you around this problem, by allowing you to save these audio samples to hard drive via SCSI.

## HARD DISK RECORDING OPTION

The HDR-TRI option is perhaps the most talked-about expansion for the Trinity, and was certainly the one which caused the most interest a year ago when it was first announced. It adds the ability to record four tracks of audio to the Trinity's sequencer. This means that you can add vocals, guitars and other acoustic sources which can't be recorded via MIDI, edit these recordings and play them back through the Trinity's effects. As I noted in the intro, Ensoniq added four tracks of hard disk recording to the capabilities of the ASR range of samplers a few years back, and a fairly limited form of stereo hard disk recording has been available on some of the Akai samplers back to the S1100. However, this is the first time I am aware of hard disk recording being available on a synth rather than a sampler.

In terms of hardware, the HDR-TRI option is more externally visible than any of the other expansions, giving you five additional connectors on the back panel, namely two analogue inputs, SPDIF co-axial in and out, and a SCSI connector. This means that you can record up to two tracks simultaneously, back up to and load audio data from DAT (as well as record from and mix down to CD-R or DAT) and connect up to seven SCSI devices (without which hard disk recording would be a little difficult). If you have the PBS-TRI option, the SCSI gives you the additional advantage of being able to save and load samples (and their associated programs, sequences, etc) to and from hard disk, not only speeding up the entire process tenfold, but also getting around the fact that samples larger than 1.4Mb cannot be saved to floppy.

The main audio track recording screen allows you to select the hard drive to record to (if you have the luxury of more than one SCSI drive), to name your recordings (called Takes), to set the input source (analogue or digital), to see the input level on VU-type metering (complete with Overload indication) and adjust it in precise dB steps (whether recording from the analogue or digital inputs, which is a little unusual but very useful), and to select destinations track(s) for your recording (1, 2, 3, or 4 for mono, or 1&2/3&4 for stereo). In general, the whole business of recording is simplicity itself. One feature I particularly liked was the ability to instantly redo a recording by pressing the Compare key, should you happen to make a mistake during a take. Too often on hard disk recorders you have to erase a recording before you can redo it. There's also an Auto Punch In feature to keep your hands free for playing as you

## pros & cons

### HDR-TRI OPTION £599

#### pros

- The only hard disk recording option for a synthesizer workstation.
- Adds SCSI, SPDIF and audio inputs to the Trinity.
- SCSI can be used to save and load samples for PBS-TRI option.
- S/PDIF can be used to send entire Trinity output, not just audio tracks.

#### cons

- Four tracks may be a little restricted in today's terms.
- Simultaneous recording of four tracks not possible.

#### summary

Although no substitute for a full hard disk recording system, this option makes a very cost-effective add-on to the Trinity, giving you not only four tracks of HD recording, but S/PDIF In and Out and SCSI storage of samples for the PBS-TRI option too.

**SOUND ON SOUND**

## TRINITY VERSION 2.0 UPDATE

At a couple of points in the review, additional features of the version 2.0 operating system are mentioned. Thanks to the fact that the Trinity's operating system is held in EEPROM, this can be loaded in from floppy disk, so you don't have to do any tedious mucking about with changing EPROMs (and breaking off the legs as you do so). Here's a full list of the extra functions version 2.0 gives you:

- Addition highlighted sound in Program, Combi or Seq mode.
- Enable 10s Hold allows quick access to nearby programs.

- Bank selection shortcut in Program or Combi mode.
- Pan Off setting for effects sends (makes effects routing easier).
- MIDI track Solo function in Seq mode.
- Delete function bug-fix in Disk Utility mode.
- Akai S3000 format compatibility (see PBS-TRI section).
- Akai CD-ROM compatibility.
- WAV file compatibility (for PC users).
- Free time display (see HDR-TRI section).
- Sequencer Pause function.
- Beep enable can be retained on power down.





OK for writing letters



BRILLIANT FOR WRITING NOTES

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# Korg Trinity Expansion Options

▶ drop into record, and even a Rehearsal mode to let you practise the drop-in before you actually do it. Version 2.0 software also adds a very useful Free Time display, which shows you how much recording time remains on the currently-selected hard drive.

Once tracks have been recorded, they can be routed through a new mixer page (MixA1-4), giving you High and Low EQ, Pan, Level and two effects sends for each track; if stereo recordings have been made, channel pairing can be switched on so that both sides are adjusted together. What's more, all mixer movements can be recorded for full automation. The 'Atrk Edit' page allows a fair amount of editing of the audio tracks, including Copy Measure, for those all-important drum-loops and other repeated phrases. Trim lets you non-destructively adjust the start and end time of a recording without moving it in time, so you don't lose sync (although you cannot hear the other tracks when editing like this, as the Audition key acts like a solo button as well).

The HDR-TRI option is every bit as good as any stand-alone hard disk recording system I have ever used (and a good deal better than most), and of course with the Trinity's excellent effects, the resulting audio mixes can be made to sound fantastic. Where I found the Trinity's hard disk recording a bit limited in comparison with computer-based systems was in the visual side of the editing, and the speed of copy and repeat functions. There's no substitute for a large monitor when looking at long recordings and for mouse-based editing tools for cut and paste operations.

My only other comment is that whilst four tracks of hard disk recording was quite a respectable figure when the Trinity options were first announced (and units like the Akai DR4 and Yamaha CBX-D5 were selling for over £1500), these days most systems offer at least eight tracks, so the HDR-TRI may seem a little restricting from this point of view.

However, to counter this, the HDR-TRI option is excellent value for money at £599 (don't forget that you have to buy a separate SCSI hard drive), especially since it gives you a SCSI interface and S/PDIF in and out, both of which are very useful for other things. Considering that the SCSI-TRI option alone is £399 and omits both the audio inputs and S/PDIF, it would be crazy not to go for the full HDR-TRI, even if the main thing you want to be able to do is save and load samples to hard drive.

## SCSI OPTION

This (slightly) cheaper option gives you just the SCSI interface for the Trinity, without the ability to record to hard disk or the S/PDIF digital interfaces. As such, it allows the same saving and loading of PBS-TRI samples to hard disk as detailed in the above section, but nothing more. One to miss, I think. Either go for the full HD option, with the attendant benefits of an S/PDIF interface, or stick to floppies and spend your £399 more wisely.

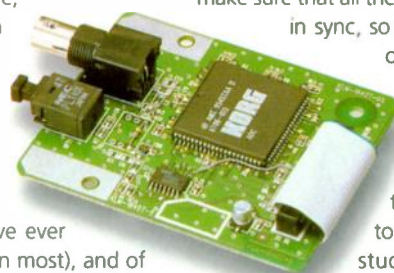
## ADAT DIGITAL INTERFACE OPTION

Those of you who read my Korg 168RC mixer review last month will know I am a bit of a broken record on the subject of ADAT interfacing. As the only multi-channel interface to have gained wide acceptance outside the inventing manufacturer's products, I think it should now be made compulsory in the same way as MIDI now is — no synth/sampler/effects unit should be without it. The ability to send and receive eight channels of digital audio at professional sample rates down one tiny optical cable is just too useful to ignore. Full marks, then, to Korg for making it available for their flagship synthesizer, in the form of the DI-TRI, and at a very reasonable price point too (£225).

With all digital interfacing, it's very important to make sure that all the digital clocks in a system stay in sync, so it's particularly praiseworthy on Korg's part that they have supplied a Word Clock In connector with their ADAT Optical Out. This is important because it means that the Trinity does not have to be the master in a full digital studio (where you might have numerous digital devices, all of whose clocks need to be kept in sync).

The ludicrous situation often arises that a humble sampler ends up being the master clock for the entire studio, just because it has no way of slaving to an external Word Clock.

Of course, nothing in this world is absolutely perfect, and it's a shame that because of limitations in the Trinity's internal architecture all eight channels cannot be used. The Trinity only has four analogue outs, a stereo master and a stereo aux, and these are simply mirrored on channels 1-4 of the ADAT digital out. Just think how great it would have been if you could have sent the output of different MIDI and audio tracks down different channels to your mixer. Still, the on-board automated mixing and effects of the Trinity are pretty comprehensive, so you can digitally send the overall output of the Trinity into a full digital mixer like the Korg 168RC without needing to take up any of its effects and EQ capabilities. Overall, this is an excellent facility for the Trinity, at a very reasonable price, and other manufacturers should take note.



DI-TRI option.

### pros & cons

#### SCSI-TRI OPTION £399

##### pros

- Lets you use SCSI hard drives to save and load samples.

##### cons

- The most expensive SCSI upgrade I have ever seen.
- Very restricted functionality compared to HDR-TRI.

##### summary

At £399, this looks very expensive as compared to the full HDR-TRI at £599, or indeed a simple SCSI interface for any other synth/sampler. Even if your main need is SCSI sample storage, you would be crazy not to buy the full HDR-TBI option.

**SOUND ON SOUND**

### pros & cons

#### DI-TRI ADAT INTERFACE £225

##### pros

- Allows Trinity to be integrated digitally with the 168RC mixer or other ADAT-compatible systems.
- Allows Trinity to be the slave for glitch-free digital audio systems.
- Cheapest ADAT interface on the market.

##### cons

- Only uses the first four digital channels.

##### summary

One day every synth will have this option, but Trinity owners don't need to wait or beggar themselves to add it.

**SOUND ON SOUND**

**E** SOLO-TRI Prophecy board option £475; PBS-TRI Playback Sampler/Flash ROM option £625; HDR-TRI hard disk recorder option £599; SCSI-TRI SCSI interface Option £399; DI-TRI ADAT digital interface option £225. Prices inc VAT.

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**Optifile's new VCA-based Drax system is designed to make professional-quality automation affordable.**

**PAUL WHITE finds out to what extent they've succeeded.**

**N**amed after a well-known UK power station, (not the James Bond villain!), Drax is a relatively low-cost VCA console automation system from Optifile, the designers of the professional Tetra system. Like Tetra, Drax is installed inside an existing mixer, so there are no external fader boxes or rack units to accommodate. If there's a disadvantage to this, it is that you have either to send your console away to have the system installed, or you have to pay extra to have an engineer fit the system in your home. Currently, systems have been installed in consoles such as the Mackie 8-buss and the Soundcraft Ghost, but there's no reason at all not to fit Drax to more expensive consoles.

#### WHAT YOU GET

The system is supplied as a basic package capable of automating 24 channels, then further blocks of eight channels are added as required, depending on the size of your console. Up to 32 channels can be driven in this way, and the system can be expanded right up to 64 channels by adding an extension

where you can change the Com port. After doing this, mouse and Drax will cohabit quite happily. The tools for configuring the system's number of channels, VCA/fader calibration and so on are available from the Utility menu, but as the system comes with the software ready-configured, the end user shouldn't have to deal with any of this.

Once installed and booted up, the Drax user interface looks like the screen dump shown in Figure 1 (right). Up to 24 faders can be seen on screen at one time, and if you have more than 24 channels, the keyboard arrow keys let you jump along in blocks of eight, or one channel at a time.

#### DRAX FEATURES

VCA automation systems don't employ moving faders, but Optifile have always done their best to create a moving-fader environment on screen, and the philosophy of their system has obviously absorbed some working practices from pro automated console manufacturer SSL. All fader moves are made from the actual console faders — there's no mousing about in cyberspace — and the

# OPTIFILE DRAX

## VCA MIXING AUTOMATION SYSTEM

card to the processor box. Circuit boards containing blocks of eight dbx 2150 VCA chips are wired to each fader, and if the automation system is switched off, a software bypass mode hands control of the VCAs back to the console faders. There's no way to bypass the VCAs, but the high-quality signal path means this isn't a significant concern.

Unlike Optifile's Tetra, which comes with its own rackmount computer, the front-end Drax software runs on a standard PC computer, so you'll also need the minimum of a Pentium PC running Windows 95 or Windows 3.1, and a colour monitor. When I asked Optifile whether the Drax software could run at the same time as a sequencer, I was told that at present this was unlikely, because of the heavy demands on the computer's processing power during busy mixes. However, Optifile are working on a new Windows driver, so this is likely to change.

A small interface box mounted on the rear of the mixing console (see the picture above left) handles the timecode input connection (Drax requires conventional SMPTE to operate), the PSU input to drive the VCA boards, and a link socket to the PC Com port. Drax can talk to either Com port 1 or 2, but if your mouse is already assigned to the same port as the Drax software, you'll have to use cursor commands to navigate to the Drax setup menu

console mute buttons are also tied into the system, allowing mute automation to be mixed with fader automation. There is one limitation concerning the mutes, and that is that Drax can't tell whether the mute is due to a mute button being pressed or by a fader being pulled all the way down. Inside a typical console, the mute button is wired straight across the channel fader, so there's no way an add-on system can differentiate between the two.

As is normal with a VCA system, only the channel faders are automated, not the groups or masters, but Drax can be programmed with up to nine VCA subgroups (though you can't include the same channel in more than one group), and a master fade function is included that lets you specify the start time, end time and curve law of a fadeout. Both mutes and faders are handled independently, so they can be recorded or modified separately. If you feel you need overlapping VCA groups, you can always create your first group, record your moves, delete the group, then create a new one for the second stage of your plan. There are no off-line editing facilities, but if you need to fix something, you just overwrite the old moves with new ones.

Mixes are recorded against timecode, so you have to have a system capable of supplying SMPTE. Drax has a virtual internal SMPTE generator for demonstration use, but this doesn't actually produce code — it just allows the system to run without an external code input. All popular SMPTE formats are catered for: 24 frame, 25 frame, 30 frame and 30 frame drop.

Unlike many budget automation systems, Drax

Drax's timecode input, VCA PSU and PC interface hardware.





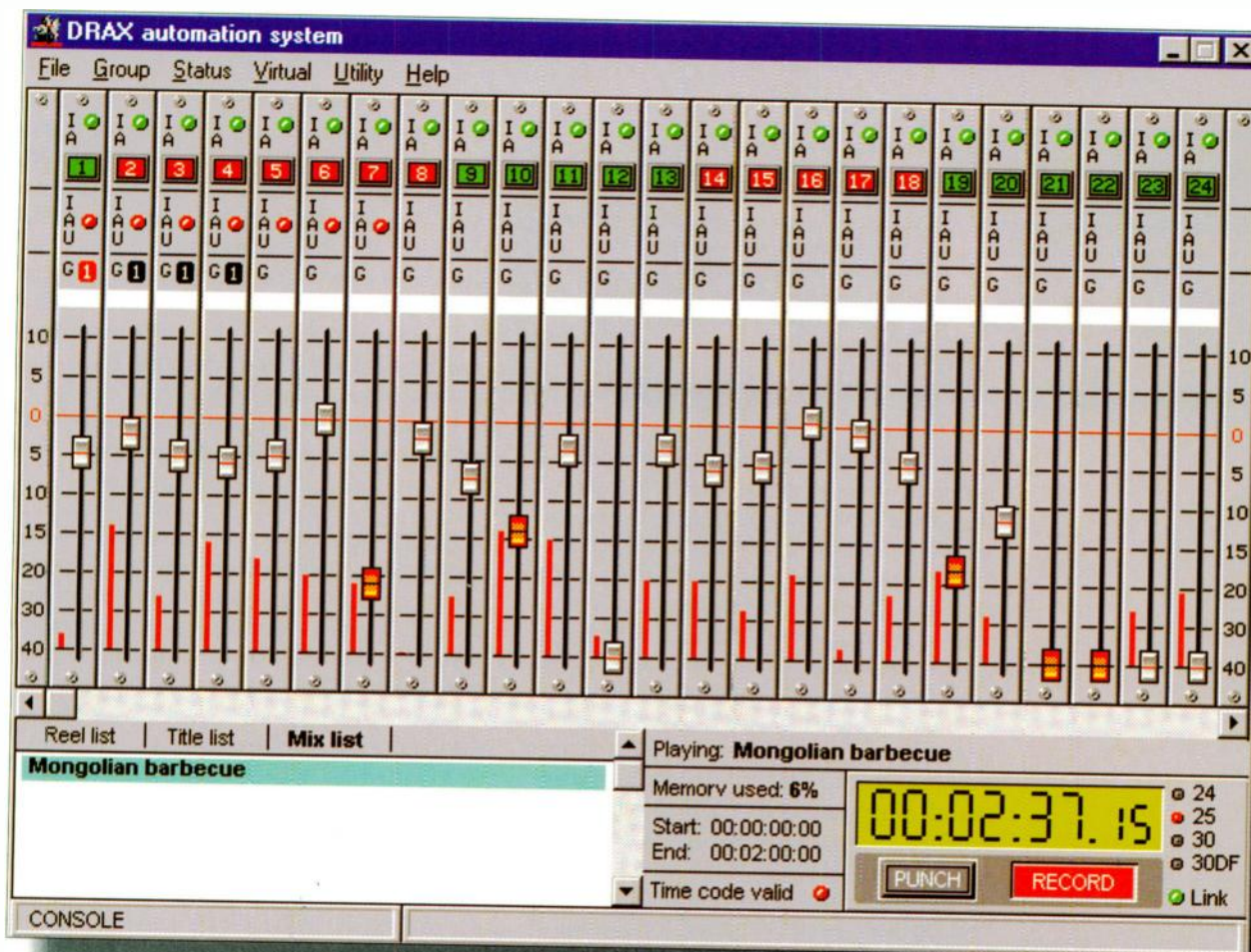


Figure 1: Drax's front-end PC software.

uses a dual-memory buffer system, so that it can hold your original mix moves, and at the same time, record new ones while you're making changes. The current mix resides in the base buffer, and as you record modifications, these are stored in a temporary buffer. After recording, you have the option to update the base buffer with the newly-recorded information, or you can discard the last pass without altering your original mix. The colour of the Memory Free window changes from black to red when new data is recorded into the temporary buffer, indicating that you must keep or discard the last mix modification before proceeding.

Once the first mix pass has been recorded, playing back the mix shows the VCA moves as moving red bars at the centre of the virtual faders, while the on-screen fader knobs always indicate the actual physical position of the console fader (unless a mute button is activated, in which case the screen fader will fall to its zero position). When the physical fader position and the VCA mix levels are the same, the on-screen fader knob changes in colour to show that the two levels match, which is useful for avoiding jumps in level when punching in and out of new mix moves.

Mutes are either in Isolate mode, or they're in Absolute mode, while faders also feature an Update mode, of which more in a moment. In Absolute mode, any mute button presses or fader moves will be recorded when Drax is set to record, but because mutes and faders have their own status buttons, you can record both together or work on them separately. Isolate mode disconnects the selected faders or mutes from the computer so

that they can be used manually. The Move mode of the Tetra system has been left out of Drax, but then few Tetra users seemed to appreciate the usefulness of this mode anyway.

Drax can be set to Safe mode (to prevent further mix data been accidentally written), or used in Rehearse mode, where all the new moves are heard in context, but not recorded — the Punch button toggles between Safe and Rehearse or Safe and Record, whichever is selected. The window beneath the counter display changes from red to green corresponding to Rehearse or Record modes. Optifile are also currently adding chevrons to the Record/Safe status button to assist any colour-blind users.

Unlike Optifile Tetra, which has the option of local status buttons, allowing the user to punch in and out of mix record via buttons on the console itself, Drax handles status from the computer only. Designated channels must first be armed via mouse or keystroke, then the Punch button is used to punch in and out of record. In this respect, the system is much like using a multitrack tape machine. It is also possible to set up auto punch-in and -out points, though I must admit that I've never had need of such a facility.

The faders provide two modes of operation other than Isolate: Absolute and Update. In Absolute mode, the current fader position is recorded, so any moves play back exactly as you made them, and any previously-recorded fader moves are replaced when you keep the mix pass. In Update mode, however, any previously-recorded fader moves are modified rather than replaced by the new fader moves. Effectively, the

**pros & cons**

OPTIFILE DRAX

**pros**

- Straightforward but powerful user interface.
- Excellent audio quality.
- Very cost-effective.

**cons**

- Desk has to be removed from the studio for installation unless you want to pay extra for a visiting engineer.
- Drax software can't yet run alongside a sequencer on the same PC, though future driver upgrades should fix this.

**summary**

A powerful and cost-effective alternative to Optifile's Tetra that sacrifices little in the way of features, and is actually better in some areas.

SOUND ON SOUND



# OPTIFILE DRAX

## MORE ON VCA AUTOMATION

Mix automation of this kind is just what it purports to be — automation you can use to help you mix. You have control over the channel faders, but nothing else, so it isn't the same thing as a system offering total recallability — such as Yamaha's O2R. However, the advantage of a VCA system is that you can use your

existing desk, and the overall cost is significantly lower than you'd pay for a moving-fader automation package. By using a little creative patching, you can automate your effects returns by feeding the effects back into two input channels. You can also fake automated EQ by splitting one signal to feed two differently EQ'd channels, then use the automation to crossfade between them.

▶ old data is added to the new data (which starts at zero from wherever the current fader position is set), so that small moves of the fader can be used to trim the old data. For example, if the chorus is a couple of dB too quiet, but everything else is fine, you simply go into Update mode on the relevant channels, then push the faders up 2dB from their current position. Users of other automation systems might feel happier with the term Trim mode.

Another feature designed to make life easier is Extend. It may be that you're working on your mix in sections, so to carry on working from where you left off, all you need to do is activate Extend, and Drax will drop into record quite automatically as soon as you get to a section of song that hasn't had any mix data recorded. Hitting the Ctrl and K keys together updates the mix in the base buffer with the new mix data, while pressing Ctrl and U discards the new pass.

## THE SYSTEM

The mix data hierarchy of Drax is quite logical, and follows the system of Reels, Titles and Mixes. Reel is where you would enter the name of the physical reel of tape to which your mix data relates, while Title defines a timecode start and end time within that reel, usually corresponding to an individual song. Mix is used to store various mix versions of the title, and though a few software tweaks were still being made at the time of this review, the idea is to allow you to key in a new name for each mix. Alternatively, if you save a mix without naming it, the mix will adopt the same name as its predecessor, but the version number will increase by one. This latter way of working seems the most logical. Once you've defined the start and end limits of a title, you can't extend it, so you should make sure you allow yourself enough room for any future intro or outro extensions before committing yourself.

Though there is only one screen in the Drax software, the keyboard commands and functions change depending on what Keyboard Level is selected. For example, routine mixing is done at the Console level, whereas you set up mix information in the Mix level. The only time the window switches to a new one is if the on-line help is called up — a most welcome addition. There are also on-screen prompts with a user-definable timeout period for dismissing them.

The designers at Optifile feel that most people using computers in the studio don't want to be tied to using the mouse, so they've created a set

of straightforward, and largely intuitive, keyboard shortcuts to enable all functions to be controlled directly from the keyboard. However, so that mouse users aren't left out in the cold, conventional menu commands are provided, as well as a number of 'click and happen' points in the fader display window. The final release version will include the ability to toggle between the available fader and mute modes purely by clicking in the appropriate area of the channel strip; in fact, I was told these changes had been made before I'd even finished writing the review!

## IMPRESSIONS OF DRAX

As an affordable automation system, Drax offers a friendly yet professional user interface, coupled with a high-quality signal path courtesy of the dbx VCAs. To my mind, most aspects of the program are actually clearer and more intuitive than on the more upmarket Tetra system. A further benefit is that the high-resolution PC display is far clearer than Tetra's low-res TV monitor.

If there's a problem with Drax, it is likely to be one of perception. The basic system costs just over £2000 for 24 channels. The basic Pentium needed to run the Drax software costs under £1000, so for under 3000 pounds in total, you get a fully-installed 24-track system with both hard and floppy disk storage, a hi-resolution colour screen, and mouse control if you want it. However, because the Drax software can't yet run alongside sequencing software on the same PC, it is almost certain to attract criticism from those potential users who simply refuse to have one more computer in their studios. Many simple MIDI-controlled automation systems will run happily with a sequencer, so some users are bound to ask why Drax can't manage to do the same. After all, a top-end studio might have the space and budget to accommodate an extra computer, but in the small studio, which is where Drax is obviously aimed, this is a very valid concern. As I said earlier, Optifile are working on new drivers to fix this limitation.

My personal view is that Drax is a very serious system, and should be viewed as a pro automation package with slightly simplified facilities rather than as a cut-price, semi-pro alternative. After all, the same VCAs are used here as in Optifile's top-end Tetra system, and the audio quality is superb. Having the automation display permanently visible is also very appealing, and if you're a mouse user with no spare desk space, you can always use a trackball. Anyone who is considering a Tetra system but can't afford it should jump at the chance to fit a Drax system.

## PRICING

A Drax system comprises the VCAs (supplied in blocks of eight, with a minimum of 24 in a system), the PC interface/CPU unit, a power supply, and the front-end PC software. A 24-channel system costs £2048.03, with additional blocks of eight VCAs costing £296.10 each — so a 32-channel system is £2344.13. The price of the extension card permitting 32- to 64-channel operation has yet to be fixed, but it will be no higher than £235. Installation of the system is free to Mackie 8-buss and Soundcraft Ghost users, provided the user can pay for shipping to UK distributors The Home Service. Contact The Home Service for the cost of installation on other consoles. All prices include VAT.

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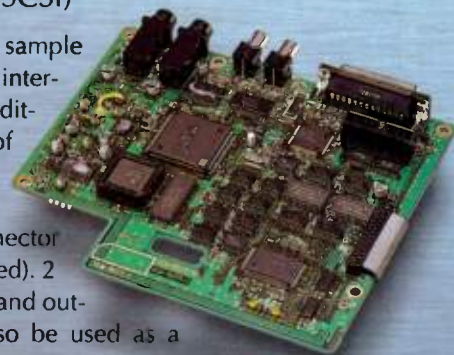
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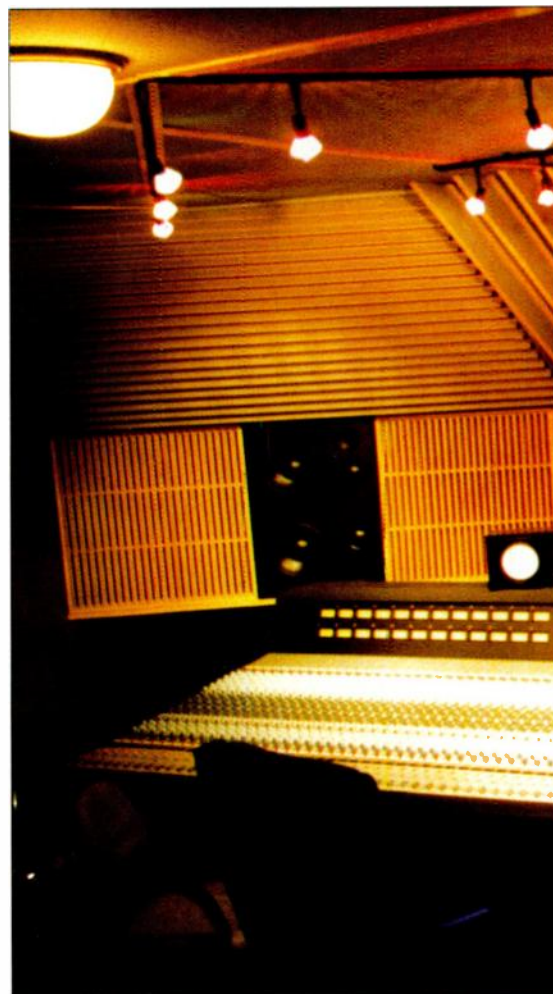
*How can adding randomness to your monitoring improve its accuracy? Acoustic designer ANDREW PARRY explains how applying Early Sound Scattering (ESS) design principles can help to make studio control rooms of different dimensions sound subjectively similar.*

**W**hen taking a brief for a control room design, acousticians are often told, "I don't need anything fancy, I just want to be able to rely on what I'm hearing". It doesn't matter whether the budget is a couple of hundred or a couple of hundred grand, the requirement stays the same; it's just the degree of precision that changes.

Whether the design is for a shoestring home setup or a fully-featured commercial studioplex, the primary requirement is one of monitoring accuracy, with all the other requirements following on after that (you don't, for instance, need high levels of isolation if you're happy to work entirely on cans).

Of course, it's never quite that simple. You probably also want the room to be comfortable enough to work eight hours at a stretch, big enough to fit the whole band in for the final mix, able to have its equipment changed without altering the monitoring accuracy, sound the same in all parts of the room, and provide mixes which sound the same when you take them to another studio, take them home, or play them in the car.

Over the years, various attempts have been made to design control rooms which tell the absolute truth about the music. Consensus now seems to be that, in fact, there is no such thing as absolute truth, because what you hear is always going to depend on the environment in which you listen to it. So instead, room designers seek to create 'neutral' rooms, which impose as little as possible of their own character on a sound, whilst still providing a viable working environment for the engineer.



# Better by Design

## EARLY SOUND SCATTERING & STUDIO CONTROL ROOM DESIGN

All sorts of clever (and some not so clever) tricks have been used in the quest for neutrality, and Early Sound Scattering looks as though it might be the next big step to achieving it. But first...

### A POTTED HISTORY OF CONTROL ROOM DESIGN

#### • THE '60s: DEAD ROOMS

In the beginning, there was rock and roll. And perfbord and rockwool. And the producer said "Let there be the direct sound, and nog-all else." And lo, it got the job done. But it sounded horrible, and engineers could only work in the studios for 20 minutes at a stretch, because they were almost anechoic, and the human animal can't cope with that. Well, OK, maybe it wasn't that bad, but you get the picture.

#### • THE '70s: RETTINGER & EASTLAKE

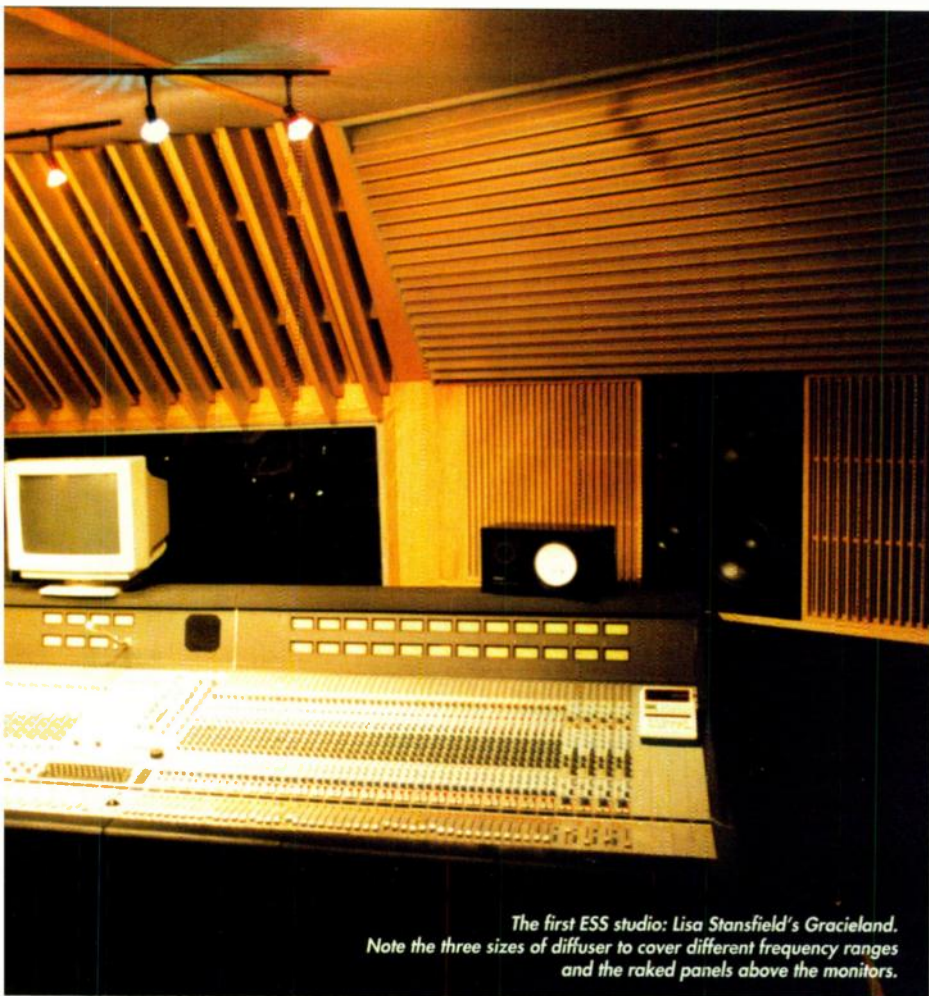
Stereo happened, and people started getting interested in what was actually going on in control rooms. The best had rough stone front walls with the monitors set flush into them, and very deep absorption at the back. The front side-walls and

ceiling were raked to prevent flutter echoes. The hard front end provided the occupants with a few reflections, giving them some acoustical perspective, so it didn't feel like they had their heads in boxes of cotton wool. Typical decay times varied from about 380ms for a room of 100 cubic metres, to 430ms for 200 cubic metres. But no two rooms sounded quite alike, nor did any two places in the same room. They tried equalisers, and made them look the same on an analyser, but still they sounded different.

#### • THE '80s: LEDE AND REFLECTION CONTROL

Live End Dead End (LEDE) was all the rage in the '80s. By making the area at the front of the room almost anechoic, American studio designer Don Davis and others opened up a new realm of realism in studio monitoring. The secret lay in the initial time gap between the direct sound and the first reflections; make this long enough and the brain can separate off the room acoustic, and ignore it. Result: a truly neutral room, where what you hear is exactly the same in any other LEDE room. To preserve operator comfort, the rear wall had to be hard, but not cause a slapback echo. Based on





*The first ESS studio: Lisa Stansfield's Gracieland.  
Note the three sizes of diffuser to cover different frequency ranges  
and the raked panels above the monitors.*

numerical theory by Manfred Schroeder, new diffuser treatments were developed (particularly by Peter D'Antonio at American company RPG Systems) to break up the echo, but still return the energy to the room as a short decay. For a fuller explanation of these, see the 'Schroeder Diffusers' box elsewhere in this article.

Reflection control was basically the same concept as LEDE, and was developed as a solution to the conflicting requirements of having a completely absorbent front end and the usual need for a studio window in the front of the room. By dint of careful geometry, you can arrange for the reflections off the glass to miss the mix position, giving the illusion of complete absorption. With even more careful geometry, you can have many reflections from the front surfaces of the room, all of them missing the mix position, forming an RFZ (reflection-free zone). For the zone to remain reflection-free, the rest of the room needs to be anechoic, or at least highly absorbent. The effect is stunning, provided you sit in exactly the right place, nobody puts a rack of keyboards behind you, and you don't want any effects racks, tape machines or anything else in the rear half of your control room. LEDE and RFZ rooms all seek to achieve essentially the same objective: a room which imposes none of its own character upon the signal. They do

this primarily by not allowing any of the early reflections to reach the engineer's ears. This poses a problem when you want to put any kit in the room, because you unavoidably get reflections off it which the room designer wasn't expecting.

### ENTER EARLY SOUND SCATTERING

One logical alternative to the LEDE/RFZ approach is to build a room in which the characteristic reflections are so uniformly random that they have no character to impose. The ESS control room is one which features a highly diffusive front end (including the walls into which the monitors are built), which scatters the early sound. The body of the room is absorbent, with most of the low-frequency absorption provided by damped membrane panels. The room can be made fairly live compared to older control rooms, with a flat frequency response and good stereo imaging, both of which remain stable right to the rear corners of the room.

The concept of surrounding the monitors with diffusers was an invention born of necessity, when a large Amek 9098 desk was fitted at Lisa Stansfield's fairly small Rochdale studio. RFZ geometry just wouldn't work in this case — the desk would have had to go too close to the speakers — so an alternative was needed. The original purpose of all the diffusers was to produce enough

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# Control Room Design



*This 02R/SADiE production room at LBS, Stockport is further simplified, but still benefits from its diffusive front end.*

▶ early energy to mask the reflection from the large desk, and so reduce comb-filter effects. At worst, the results could have turned out equal to the best rooms of the '70s, but with the advantage of having the erratically random stone replaced by statistically perfectly random diffusers. The same approach was taken to avoid geometry problems when Lisa Stansfield's home studio was constructed in Dublin. When both studios were completed, it was found that material could be transferred between the two with complete confidence, despite the two rooms being radically different in shape and size.

## SO, HOW DOES IT WORK?

### • STEREO IMAGING

A common assumption about diffusion is that, by smearing the signal in time as well as space, the stereo image is bound to be destroyed utterly. This, however, has turned out not to be the case. A stereo image is a psycho-acoustic illusion: a trick played on the brain and ears. The ears gather whatever information they can, and the brain makes whatever sense it can of the information. When the information is conflicting, the brain fails to make sense of it, and the illusion is lost. The information of most interest to the brain is the level difference between left and right ears, but timing is also very important. If the timing information conflicts with the level information, the image disappears. Reflections assist the brain in localising a sound source, but that is not the aim when trying to form a stereo image. Scrambling the timing information makes it more difficult to

localise the loudspeaker itself, leaving the level information, uncontradicted, to provide the image. The resulting image, while not quite as dramatic as that found in a well set-up RFZ room, is reliable regardless of changes of equipment in the rear of the room, and extends the full width of the desk and right to the back wall.

### • FREQUENCY RESPONSE

The most readily-grasped measure of a control room's 'quality' is its steady-state frequency response, as shown on a spectrum analyser with a pink noise signal source.

Although popular in the late '70s, the use of equalisers to compensate for room acoustics is now generally frowned upon, except in certain circumstances. In particular, if you flush-mount speakers which were designed to be free-standing, a bass lift will result, because the speaker is radiating the same power into a hemispherical space which it ought to be radiating omnidirectionally. In this instance, a bass cut may be applied in the feed to the amplifier; a steady-state remedy for a steady-state anomaly. Using a graphic equaliser for this task is unwise, as each filter causes all sorts of phase shifts at its turnover points, causing a loss of definition at the bottom end. A simple 'bypassed pad' first-order bass cut causes the least possible disturbance to the phase at low frequency.

Provided your speakers have been built right, the steady-state frequency response of your system depends mainly on the room's decay time response. To achieve a flat frequency response, the decay time of the room must be approximately

## ABOUT THE AUTHOR

The author has been involved in professional audio since the early '80s. After a few years of running and maintaining PA rigs of various shapes and sizes, he started building custom gadgets and systems for stage and studio use, whilst also offering maintenance services to small studios. He ran the technical department of a well-known studio equipment retailer for five years, while studying acoustics in his spare time. Since 1990 he has been an independent studio consultant, designing, installing and maintaining studios. He would welcome correspondence on the ideas presented in this article — letters to The Editor at the usual SOS address.



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# Control Room Design

- equal in each octave band. Equal decay times may be achieved at mid and high frequencies by specifying suitable absorbent treatments for the walls and ceiling. Typical absorbers in this frequency range include foam tiles, drapes and soft furnishings, and mineral or glass fibre matting up to 200mm thick. Deep trapping, Helmholtz and membrane absorbers and resonant pipes may

respect to frequency (for a fuller explanation of resonances and details of Bolt's ratios, see the 'Exciting Rooms' box elsewhere in this article). In non-rectangular rooms, the averaged dimensions should still be made to fit one of Bolt's ideal ratios, as the non-rectangularity will essentially only damp the resonances, and not eliminate them.

Comb filtering is the effect where a delayed

## SCHROEDER DIFFUSERS

A Schroeder diffuser is a structure comprising a number of wells of different, carefully-chosen depths. As a ray of sound strikes the irregular surface, instead of bouncing off it like a mirror, it bounces out of each well at a slightly different time. The result is many small reflections, spread out in

both time and space. The frequencies at which such structures operate as diffusers depend upon their dimensions, with the lower limit being that frequency where the deepest well is a quarter-wavelength, and the upper limit being where the period of the structure is equal to half a wavelength. The operating range of a single diffuser is limited to about four octaves, because if the deepest well is

deeper than about fifteen times its width, it begins to behave as a diaphragmatic absorber. The way it actually works is a bit complicated, but here goes.

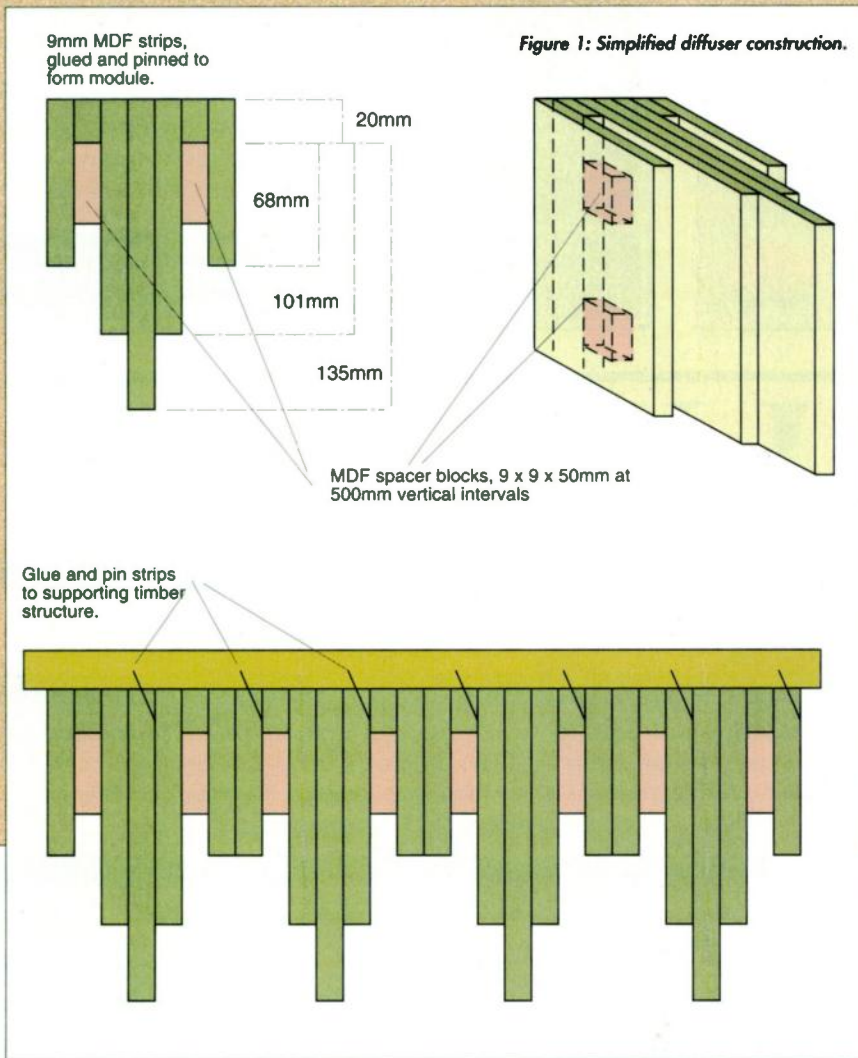
Any wavefront travelling in a particular direction may be considered as being made up of an infinite number of side-by-side omnidirectional 'secondary wavelets'. The direction of propagation of the wave depends on the spatial arrangement of the notional sources of these wavelets, or on their phase relationship (same thing, really). If a wave is reflected by a Schroeder diffuser, each well produces a reflection at a slightly different time, due to its different depth. The phasing of these reflected wavelets is what determines the direction of the reflected wave, and if the diffuser is correctly designed, the reflected wave will depart in many directions. (A theoretical diffuser having infinite wells would reflect the wave in a perfect hemidisc.) The wells are arranged in a cyclic sequence, and the best sequences consist of a prime number of wells per cycle.

A number of ways of determining the well depths has been tried over the years, but by far the most popular is the quadratic residue sequence. (I tried to get away without using the words 'quadratic' and 'residue', but I just couldn't help it). To quote Dr Peter D'Antonio, these sequences 'have the unique property that the Fourier transform of the exponentiated sequence values has constant magnitude in the diffraction directions'. The well depths are given by the following equation:

$$d_h = h^2 \text{ mod } N \frac{L}{2N}$$

Here,  $d$  is the depth,  $h$  is the well number,  $N$  is the prime number on which the sequence is based, and  $L$  is the wavelength of the lowest operating frequency.

Figure 1: Simplified diffuser construction.



be used to control low-frequency decay, but because low-frequency propagation is primarily by excitation of room resonances, close attention must also be paid to the shape of the room. The room proportions (the ratios of height to width to length) should closely approach one of Bolt's ideal ratios (worked out in the middle of this century), which distribute the resonances evenly with

signal cancels with the direct signal at frequencies where the path difference is an odd number of half wavelengths. The depth of the cancellation notch depends on the difference in level between the two signals, with complete cancellation if they are exactly equal. The effect on the sound varies throughout the room, because the extra distance the reflected ray travels varies. By spreading the reflection out in time, Schroeder diffusers close to the loudspeakers provide a highly effective method of minimising the effect. Where the primary reflection is from a diffuse surface, the reflection will be markedly reduced in level, as the energy is being dispersed in many directions, so much smaller cancellations will be produced. However, because



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# Control Room Design



*Martin Price (formerly of 808 State) commissioned the design of this room to produce the recent Kaliphx album. The simplified geometry of the room significantly reduced construction costs.*

► the spatial diffusion is accompanied by temporal diffusion, the notches are damped to the point of non-existence. If the primary reflection is not from a diffuse surface, it will be being fed from the diffuse area at the speaker, with much the same effect.

Examining the impulse response of an ESS room compared with a similarly-dimensioned RFZ room reveals that the inevitable desk reflection has changed from a tall spike into a squat hump. This translates into the frequency domain as exchanging deep, narrow notches in the high-frequency region, of up to about 15dB depth, for about 2dB of gentle ripple. The improvement in high-frequency phase coherence that removing the deep notches provides is hard to quantify, but hi-fi buff words like clarity,

naturalness and transparency spring to mind.

## • SPATIAL UNIFORMITY

The use of loudspeakers with a highly hemispherical output is central to the ESS design, in order that sufficient energy is delivered onto the diffusers close to them. This, in turn, means that off-axis listeners will receive a very similar direct sound spectrum to those on-axis. This, of course, is nothing new, and soft-dome speakers have been increasingly popular since the early '80s.

However, anyone who has ever studied any physics knows that two point sources in phase produce fringing effects, which will cause a room to have a different frequency response at every point in space. This is basically the same problem as

## EXCITING ROOMS: ROOM SHAPE

Low frequencies, from about 200Hz down in typical control rooms, behave very differently from higher ones. High frequencies travel like a light ray: in a straight line from the speaker to your ear. With low frequencies, the speaker dumps energy into the room, exciting the room's natural resonances, and it is these resonances that then couple into your ears. If the room shape is such that its resonances, or modes, are all bunched together, then at some frequencies there will be a big lift in what you hear, while at others, where the room does not respond, there will be a big dip. The modes of a room come in three flavours, axial, tangential, and oblique. Axial modes occur, as their name suggests, along the axes of the room: front to back, side to side, and floor to

ceiling. They are the easy ones to predict the frequency of, because they occur at all multiples of the frequency at which the length, width or height of the room is half a wavelength. Tangential modes are a bit harder to calculate, as they take in any two pairs of opposite surfaces, and oblique modes are even worse, making the grand tour of all six surfaces. If you really need to know the frequency of a particular mode, use the following equation:

$$f = \frac{c}{2} \sqrt{\left(\frac{n_x}{L_x}\right)^2 + \left(\frac{n_y}{L_y}\right)^2 + \left(\frac{n_z}{L_z}\right)^2}$$

Here, f is in Hz, c, the speed of sound, is about 344m/s, L is the room dimension and n is the order

of the mode. The point of all this is that, unless your room is a really bad shape, you're not actually all that interested in the frequencies of all these modes, only in how evenly spread out they are. If they're poorly spread out, then where they clump together, the room will show a response peak, and low levels at other frequencies. In smallish rooms, the region which tends to suffer the most in this way is from about 50Hz to 150Hz, right where you need the most reliable response for mixing. The maths is too complicated to go into here, but if the ratios of height to width to length (in any order) are 1.14:1.39:1 or 1.28:1.54:1 or 1.60:2.33:1 (Boit's golden ratios), then the modes will be perfectly spaced, and low-frequency response is pretty much guaranteed to be smooth.



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# Control Room Design

► the comb filter effect described above, except now we're talking about two sources and a spatial anomaly, rather than one source, a reflection, and a frequency domain anomaly. If you haven't ever noticed this, try listening to some 1kHz tone in mono on two speakers, and move your listening position from side to side by a foot or so. The level changes dramatically, as does the apparent direction as you move through the fringes, or hot spots. The big difference with the ESS room is that this fringing is almost completely absent. The diffusers close to the speakers effectively convert the speakers to large plane sources, which do not suffer from the same constructive and destructive interference effects, removing the biggest obstacle to achieving consistency of frequency response throughout the room. Also, the imaging benefits from this removal of hot spots, because the level differences at the ears are more likely to resemble those at the speakers. Many control rooms also exhibit a nasty bass lift close to the back wall. In any closed space, close to the boundaries, you get a rise in level at low frequency due to the pressure zone effect. The use of damped membrane absorbers, especially on the rear wall, where the effect is most pronounced, minimises this problem. The mathematics of why this works is beyond the scope of this article, but concerns the phase shift at which the membrane re-radiates the energy it fails to absorb.

• DECAY TIME

The decay time in the control room greatly affects the comfort of the engineer, and too short a decay can cause fatigue after quite a short time. In 1977, Michael Rettinger, in his AES paper *On the Acoustics of Control Rooms*, determined that the perceived liveness of a room depends upon the ratio of the decay time to the room volume, and suggested an ideal relationship for a recording control room. Since then, probably due to increasing awareness of the need for engineer comfort, rooms have tended to be built to be slightly more live than this, and ESS rooms are normally designed to have a decay about 20% longer than that suggested by Rettinger. When calculating control room decay times, Sabine's simple formula (see the 'Sabine, Eyring, and Fitzroy' box elsewhere in this article for more on this) is inadequate, as the room is both highly absorbent

and non-uniformly covered. Accordingly, Eyring's formula resolved along three axes after Fitzroy is recommended.

• REPEATABILITY

The biggest factor which makes reflection-control rooms different from each other, given that the designer intended them to sound identical, is the assortment of other kit that ends up in the room. If the accuracy of the room relies upon freedom from early reflections, one reflection from behind the engineer makes a huge difference to the overall sound, and variations in position or size of the racks, trollies, and keyboard stands will cause no end of variation in the room acoustic. If, instead, these extraneous arrivals are just a minute part of a cloud of diffuse arrivals, the effect of changing them, within reasonable limits, is negligible, and therefore two quite different room layouts can sound almost identical.

## HOME STUDIO APPLICATIONS

Most home studios are not quite so grand as those shown in the photos accompanying this article, so you may well be wondering how all this affects you, and whether your studio can actually benefit from early sound scattering at all. If you're working with anything more than purely nearfield monitoring, the answer is yes. Even in rectangular rooms with free-standing or bracket-mounted speakers, the addition of areas of diffuser on the side walls, and on the front wall if possible, will produce many desirable early reflections which will help to mask the room character. The most important frequencies to scatter are in the 1-5kHz region, and dimensions for such a diffuser are given in Figure 1. The diffusers should be applied for a couple of feet either side of each primary reflection point, and if you're not sure where that is, you probably ought to be getting an acoustician to do the geometry for you.

So, there you have it. Add enough smooth randomness to any imperfect system, and the imperfections virtually disappear. These rooms really work, and give a good representation of what your mix will sound like away from the studio. They're pleasant to work in, and can be tailored to suit even quite modest construction budgets without greatly compromising performance.



### STATE OF DECAY: SABINE, EYRING, & FITZROY

The simplest way to predict the decay time of a room is by using the equation formulated in the early years of this century by the physicist WC Sabine:

$$T = \frac{0.161V}{A}$$

Here, T is the RT60 decay time, V is the volume of the room in cubic metres, and A is the total absorption in the room, in metric Sabins. This is fine for predicting decay times in fairly reverberant spaces, where the absorption is evenly distributed and the average absorption co-efficient is no more than about 0.2. You just add up all the areas of

absorber multiplied by their co-efficients to get the value for A, and out pops your answer. In large spaces, A should also include an allowance for absorption by the air, which depends on temperature, frequency, and relative humidity.

CF Eyring followed up Sabine's work, improving upon his formula to make it applicable to less reverberant spaces, by treating the waves as though they were being absorbed only at the surfaces.

$$T = \frac{0.161V}{-S \ln(1-\bar{\alpha})}$$

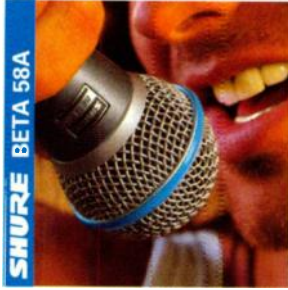
Another physicist, Fitzroy, also later improved upon Sabine by allowing the absorbent material to be distributed unevenly:

$$T = \frac{S_x}{S} \frac{0.161V}{A_x} + \frac{S_y}{S} \frac{0.161V}{A_y} + \frac{S_z}{S} \frac{0.161V}{A_z}$$

Here, S<sub>x</sub>, S<sub>y</sub> and S<sub>z</sub> are the areas of absorber projected onto the three axes of the room. Since control rooms tend to be fairly dead and non-uniform, it seems logical to replace the Sabine expression in each term of Fitzroy's formula with Eyring's, and this has been found to produce results which correspond well with measured values. The large quantity of sums involved in calculating decay times at octave centres suggests the use of either a spreadsheet or a dedicated computer program to enable a design-by-trial process.



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# Surround for the Smart

*If you have a cheap Dolby Surround decoder in your home — say as part of a 'home cinema' entertainment system — and a stereo mixer, you have everything you need to start mixing in Surround sound.*  
**HUGH ROBJOHN**  
*explains how to enter another dimension...*

## EMULATING DOLBY SURROUND ENCODING WITH A STEREO MIXER

It is hard to believe that the Dolby Motion Picture 4:2:4 matrix Surround sound system has been around for 20 years. The first well-known feature film to use this format was *Star Wars*, back in 1977. Since then, there have been over 6000 films released in the Dolby Stereo format (as the cinema Surround system is known), and there are over 30,000 Dolby-equipped cinemas worldwide to watch them in!

For those not familiar with the format, Dolby's 4:2:4 MP matrix combines — or encodes — four separate signals (Left, Centre, Right, and Surround, or LCRS), in such a way that they form a stereo-compatible 2-channel format for recording and broadcasting. The encoding process is relatively simple, with a useful side effect in that we can often take advantage of 'free encoding' with some normal stereo material (see the 'Free For All' box).

On playback, a decoder unit is used to separate the stereo-compatible signal and re-generate the original four LRCS elements. Unfortunately, any matrix system is inevitably compromised, and it is impossible to completely recover the original signals with perfect isolation — there will always be some crosstalk between channels. The decoder disguises this problem through a 'steering' process which emphasises the signal emanating from its appropriate loudspeaker by cancelling out a proportion of the crosstalk in adjacent channels. It is this 'active' steering process which is both the strength and weakness of the Dolby Matrix Surround system.

Note that however many speakers you decide to use to handle the rear-channel Surround signal (normally two in a domestic setup, but many more in a larger venue — see Figure 1 to give you an idea of the layout of a typical TV-based home system), they will all receive the one 'S' signal.

### A DOMESTIC SCIENCE?

In 1989, Dolby licensed an integrated circuit version of their Surround decoder for the domestic market, entitled the Pro Logic system. This replaced the previous, and rather inferior, passive domestic system, called simply Dolby Surround. The new active decoder opened the flood gates for Dolby Surround-encoded material for domestic consumption: CDs and cassettes, radio and television broadcasts, video tapes, LaserDiscs, computer games — you name it. Dolby Surround-encoded material is everywhere.

If you are in any doubt about the size of the Surround market, Dolby claim there are now over 21 million home cinema systems worldwide equipped with Dolby Pro Logic Surround decoders, with the numbers growing daily. Just have a look around your local electrical showroom at the number of TV sets, midi hi-fi systems, hi-fi receivers and dedicated separate Surround units that boast built-in Pro Logic decoders. On top of that, most media software producers are now making Dolby Surround-encoded products. You might be surprised

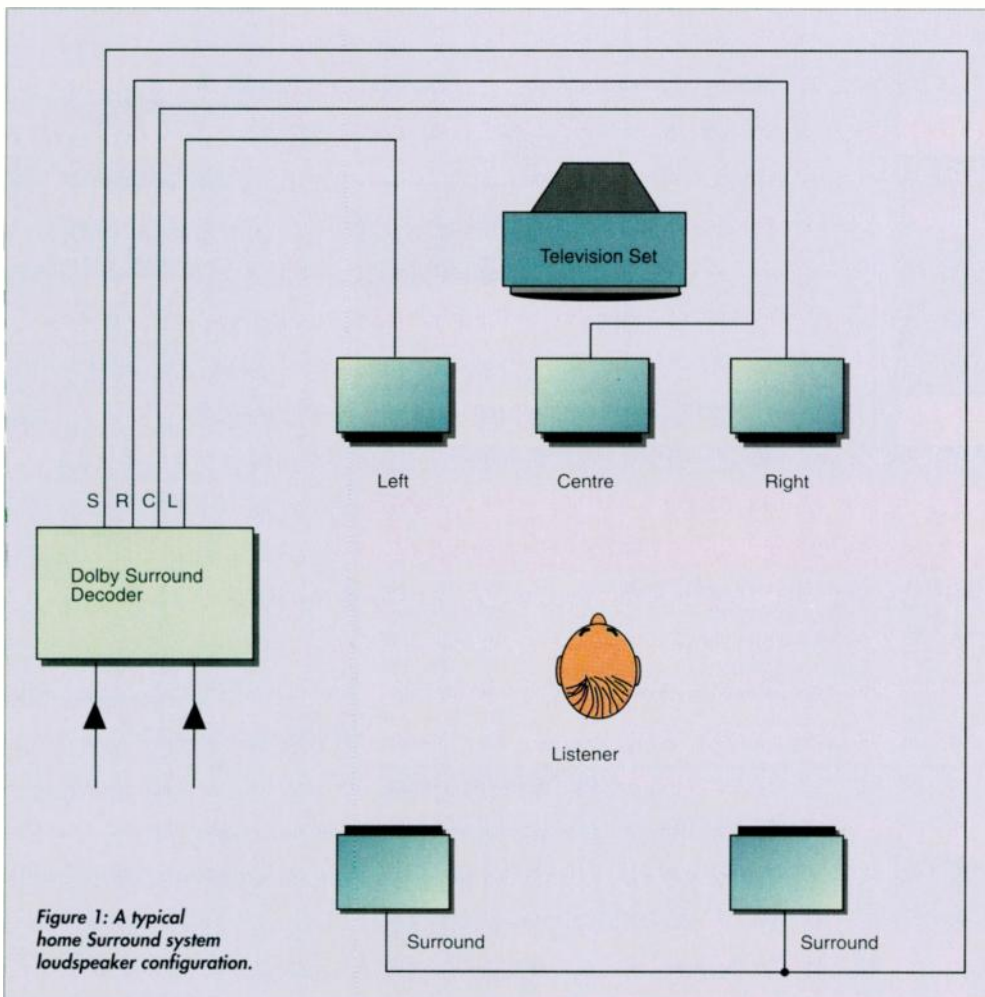


Figure 1: A typical home Surround system loudspeaker configuration.





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# Dolby Surround sound on the cheap

- at the number of TV programmes which are Surround-encoded (although relatively few carry a Dolby logo) and again, the number is growing rapidly.

## COME OUT — YOU ARE SURROUNDED

So, what does all this have to do with you? Well, if more and more people are equipped to listen in Surround sound, shouldn't you consider taking advantage of the extra creativity this format allows? Furthermore, if you are (or want to become) involved in producing background or theme music, jingles and sound effects for radio, television and computer games, Dolby Surround is increasingly the required format.

The first hurdle most people think will prevent them from producing Surround-encoded material is getting hold of an encoder. Worry not — you don't need one, although there are a few practical advantages if you do have one. It is possible to purchase suitable encoders from a number of different manufacturers, including Dolby (about £1469 inc VAT for the professional SEU4 encoder) and RSP Technologies (£871.85 inc VAT for the Circle Surround Encoder) to name but two. The purpose of this article is to explain how the encoder works, and how you can manage without one using just a stereo mixer.

What you absolutely cannot do without if you're working in this format is a Pro Logic-

compatible decoder. There are lots of options here, starting at under £200 (inc VAT) for a basic domestic Pro Logic-equipped decoder (check out Tandy's offerings). Denon, Marantz, Meridian, Sherwood, Sony, Yamaha, and countless other domestic hi-fi manufacturers have an enormous variety of suitable units at an equally wide variety of prices.

The professional studio decoder from Dolby themselves is the £1469 SDU4, and the 'compatible' RSP Technologies system (the Circle Surround High Performance decoder) is £1030 inc VAT. The professional systems are often easier to integrate into a pukka studio setup because of the higher operating levels and balanced connectors, but the domestic systems often offer more flexibility (such as splitting the bass away from the centre speaker).

I cannot emphasise enough how important it is to monitor your Surround mix through a Pro Logic decoder. The key aspect about the decoder, as I mentioned above, is that it 'steers' signals to the various loudspeakers (the 'active' part of the decoder) and this can have very pronounced effects on the perceived balance and on instrument positioning (especially across the front). If you monitor through the decoder, you can tweak the mix slightly to compensate for its influence, but if you don't, your mix may suffer from some very unpleasant effects, and you will be none the wiser!

## IT'S BEHIND YOU! — SURROUND MIXING TIPS

### • LINE IT UP!

The most important thing to do before mixing is to ensure that your recorder is accurately lined up. You need to check that when you send a signal equally on left and right outputs (ie. a signal panned centre, or a Surround signal routed through the stereo channel), it will be recorded at exactly the same level on both tracks of the recorder. If you are using an analogue recorder (tape or cassette machine) it would also be worthwhile checking that the azimuth is set correctly. If either of these things is out of alignment, it may be difficult or even impossible to decode a decent Surround signal on playback.

### • STAYING COMPATIBLE

When you are mixing, it is a good idea to check regularly for mono and stereo compatibility. The most obvious effect will be the complete absence of anything routed exclusively to the Surround channel when listening in mono (the Surround channel is encoded in opposite polarity on left and right channels, so when they are summed for mono, the Surround signal is cancelled out completely). In practice, this means not allocating anything really critical to just the Surround channel, and being aware of how back-to-front 'overhead' pans will sound to the mono listener. As far as the stereo listener is concerned, all four channels will be audible, but the Surround channel is out-of-phase between left and right. In normal circumstances, this will actually add to its spaciousness, but may become unpleasant if there is a lot of Surround information compared to frontal signals.

### • GET A WIDER PERSPECTIVE

The steering circuits within the decoder have a

tendency to narrow the stereo image quite markedly, so be prepared to mix things with a wider perspective than if you were working in conventional stereo.

### • STEER CRAZY

Another side effect of the steering process is that a signal which appears to be panned smoothly from left to right, say in stereo, will behave quite differently when listened to through a Pro Logic decoder. The steering circuits try to allocate a sound to just one loudspeaker at a time, and so it may appear that the panned signal has trouble moving away from the left speaker at first. It will then jump quickly to the centre and stick there a while, before jumping over to the right. Assuming you are listening to your mix through a decoder, you should be able to compensate for this as you pan, although it is not particularly easy with conventional stereo pan pots.

### • WATCH THOSE LEVELS!

As mentioned elsewhere in this article, Dolby decoders only steer what they consider to be a 'dominant' signal (ie. any signal slightly louder than the background) and if there is no clearly dominant signal, the steering circuits temporarily switch off, with a corresponding increase in crosstalk between channels. If your soundtrack contains a continuous ambient drone, with an intermittent lead line, it could cause the decoder to repeatedly switch between steering and non-steering modes. As this happens, you may find that the drone becomes unstable in terms of its imaging — and it might even suffer from level pumping. The only cure is to adjust the balance between drone and lead line. Again, monitoring through the decoder will make any such problems very obvious as you mix!

### • A PLACE FOR EVERYTHING?

For a similar reason, *don't* try to set the pan position of a specific sound in isolation — Solo-in-Place monitoring facilities are of little use in Surround work. The reason is that any sound monitored by itself will always be dominant and will be steered accordingly. However, in combination with the other elements of the mix, this particular sound may not be dominant at all, and some other signal may determine the decoder's steering characteristics, producing a completely different spatial position for the sound in question!

### • DON'T OVERDO IT

Finally, don't over-use the Surround channel. It is very tempting to use it a lot at first, and have all your signals flying around overhead! In real life, we naturally expect the main source of sound to be in front of us — our whole hearing system is actually geared up to help us get our head and eyes pointing at the main sound source. Excessive use of the Surround channel for key sounds can become very tiring very quickly. In the early days of cinema Surround systems, the Surround channel was called the Effects channel, and I think this is a much better way to think of it and what it is best used for. By all means, use the Surround channel for ambience, and to help draw the listener into the sound stage, but keep the bulk of the main sounds — lead lines, drums, rhythm, vocals and dialogue — towards the front. Use the Surround channel mainly for reverberation and ambient elements of the soundtrack which help to set the 'acoustic scene'. Used sparingly, the Surround channel will have a far stronger dramatic effect when it is warranted.



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# Dolby Surround sound on the cheap

## ENCODING

The standard Dolby encoder is a relatively simple device — at least in overview — which allows the easy construction of a home-made encoder. The standard encoder unit has four inputs and two outputs. The latter are referred to as Lt and Rt (it stands for 'Left Total' and 'Right Total'). The left and right inputs pass straight through to the outputs of the encoder with minimal signal processing (see

simple stereo mixer. Firstly, the Surround signal is reduced in level by 3dB for the same reasons as the centre channel. It is then band-limited to remove everything below 100Hz and above 7kHz, (a process which is repeated in the decoder). The reason for removing the frequency extremes is three-fold: firstly, if left and right channels are not accurately level or phase-matched in the distribution media, there will be a significant increase in the level of crosstalk to the Surround channel. By removing high frequencies from the Surround signal, it is easier to disguise this potential problem. Secondly, in real life, distant sounds from behind a listener are shielded from the ear canal by the pinnae (outer ears) which impose a roll-off above about 7kHz. Mimicking this effect makes the Surround sound more natural and less obvious. Thirdly, removing the requirement for low frequencies (below 100Hz) allows small 'satellite' Surround loudspeakers to be used (which are cheaper and easier to install) — and the three front channels are quite capable of producing sufficient LF signals. Although this band-limiting is performed in the encoder, it is also repeated in the decoder, so we can simulate the encoder processes without applying this filtering, relying on the decoder to impose the bandwidth restrictions instead.

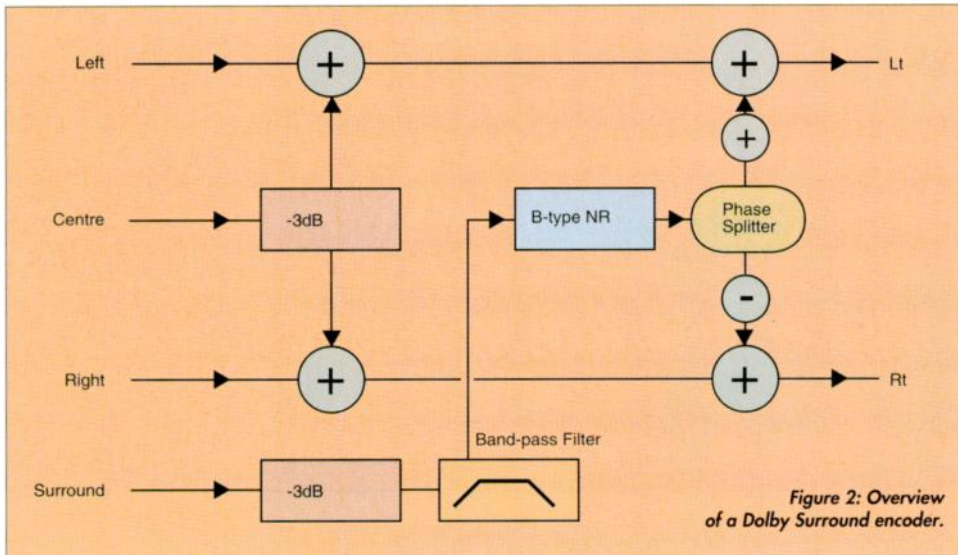


Figure 2: Overview of a Dolby Surround encoder.

Figure 2), and the Centre and Surround signals are combined with these in specific ways.

The centre signal is simply reduced in level slightly (by 3dB to avoid reducing headroom too much, and to ensure an even power distribution across left and right when listening in stereo), and is then added in the same polarity to both left and right channels equally. Exactly the same effect can be produced by simply panning a signal centrally between the left and right mix busses on your mixer (although in this case, the level reduction is often more like 4.5dB, but this will not significantly alter the results). Adding the centre signal to left and right in this way guarantees stereo and mono compatibility for the Surround-encoded material.

The Dolby system processes the Surround signal in a much more elaborate way, but it is still possible to simulate the processing with little more than a

After the level adjustment and band-limiting, the signal passes through a modified Dolby B-type noise reduction encoder, which applies 5dB of high-frequency boost (a normal system would apply about 10dB). B-type noise reduction is added because the Surround signal is delayed in the decoder (typically around 25ms in a domestic listening environment) and early systems even used analogue devices to perform this function. The 'bucket-brigade' circuitry employed (so called because it achieves the required delay by passing the signal through many stages of short delay, somewhat like a line of firefighters passing buckets from hand to hand) are inherently pretty noisy, and the B-type noise reduction helped to maintain the quality of the Surround signal as it passed through the decoder. Fortunately, the high-frequency boost applied by this stage of the

### FREE FOR ALL — 'FREE' ENCODING

At the beginning of this article, I mentioned that we could take advantage of 'free encoding' with some types of stereo material. Basically, a Surround decoder will automatically send anything which is of a similar level, but opposite polarity between left and right channels, straight to the Surround output. This is usually very handy — artificial reverberation, for example, is automatically spread across left,

Surround and right. Many simple stereo recording techniques also capture signals in such a way that the decoder spreads them across the rear channel. This is especially true of spaced microphone techniques, including Decca Trees (a triangular array of omnidirectional mics) and Binaural or Dummy Head systems. It also goes for any coincident-pair arrangement that uses hyper-cardioid or figure-of-eight microphones —

really anything that produces a large difference signal between the left and right channels.

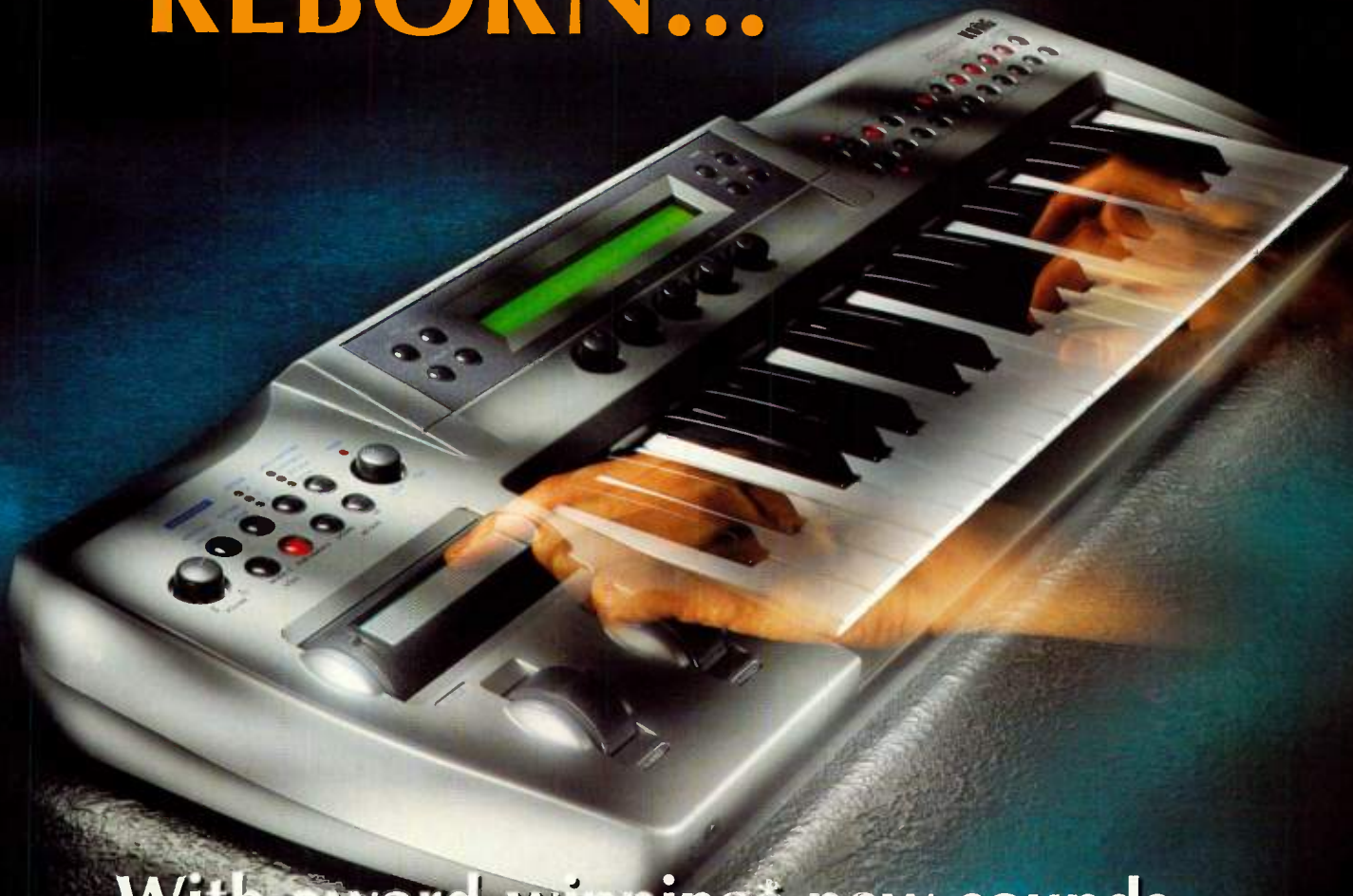
As an extension to this idea, systems which create pseudo-stereo from a mono source will also generate a strong Surround signal, and stereo-width controls can be used to manage the balance between frontal and Surround channels. Increasing stereo width also increases the Surround channel, whereas decreasing width reduces the Surround content.



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# KORG



# Dolby Surround sound on the cheap

► encoder processing is so small that it can be omitted with negligible detrimental effects in a simple home-made encoder.

Finally, after all of the other processing stages, the Surround signal is split and each half is phase-shifted by plus or minus 90 degrees (giving 180 degrees phase shift between them).

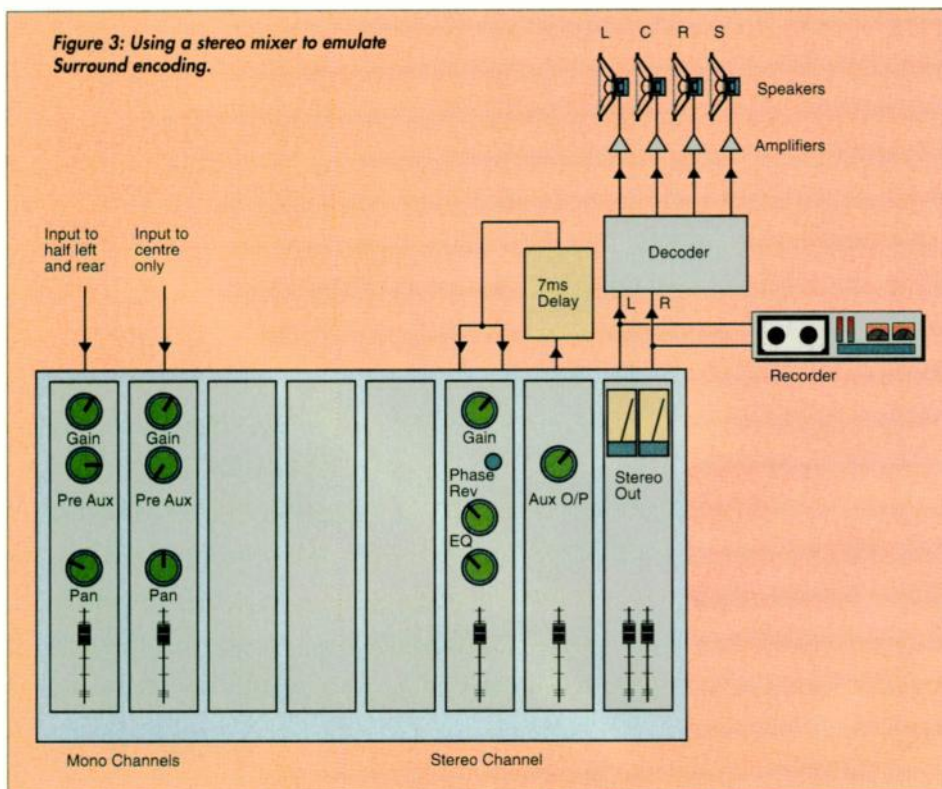
To get a signal to the rear Surround channel, you need to add it in opposite polarities to the left and right busses at the same time. A stereo channel on the mixer is often ideal for this — just arrange for a mono input to appear on both sides of the stereo channel, and switch in a phase reverse to one side. Hey Presto — the signal will be decoded to the Surround loudspeakers.

To make the whole process a bit easier and more practical to operate, you could use an auxiliary send buss (deriving the signal pre-fade allows easier rear-to-front pans) to gather the Surround elements from the appropriate channels, and then plug this auxiliary output into the stereo channel to be combined with the Lt and Rt signals, as described above. There is a slight technical hitch here, however. Consider trying to make a sound 'fly' overhead from back to front by panning the signal between the Surround channel and the Centre channel. This could be done on our home-made system by starting with the pre-fade auxiliary send turned up and the fader closed (with the pan pot central). By turning down the auxiliary send at the same time as bringing the fader up, the sound will be panned from the Surround channel to the Centre channel. However, the centre signal is effectively (L+R) while the Surround signal is (L-R). When the panning reaches mid-way, the +R and -R signals will cancel, and the end result will be that the sound 'flies' around the left of the room rather than overhead.

To overcome this annoying effect, all we need to do is use a simple delay line to decorrelate the Surround and front channel elements of any signal panned to multiple destinations. This delay is not needed when using a genuine encoder because of the particular way in which the Surround channel is added to the left and right signals using 90-degree phase shifts. A good delay time setting which seems to work well with everything is 7ms — just long enough to avoid phasing effects, but not so long that it is perceivable as a delay. If you really want to do the job properly, you could use the stereo channel EQ to roll off everything above 7kHz and below 100Hz. (See Figure 3.)

## DECODING

The job of the decoder is to try to extract the four signals from the 2-channel combination. The Centre signal is detected by looking for anything which is at the same level and polarity in left and right (ie. the sum), while the Surround channel is found by looking for same-level but opposite-polarity signals (ie. the difference). The nature of the simple matrix encoder means that the centre signal is mixed in to both left and right, as is the Surround (albeit in opposite polarities). If you think about it, this means that there is inevitably a large amount of crosstalk between adjacent channels —



shifted signals are then added to the left and right channels. In simple terms, the Surround channel is effectively added in opposite polarities to the left and right channels, which is, fortunately, very easy to simulate in a home-made encoder.

## HOME-MADE DOLBY

It is simple to create a pseudo-Dolby encoder from a stereo mixer, with pretty respectable results. Anything panned fully Left or Right on the main mix buss will only appear on the left or right output channel of the decoder — exactly as required. Anything panned centrally will be of equal amplitude and phase on left and right, producing exactly the same conditions as the real encoder and, once again, the decoder will route such signals to the Centre loudspeaker. The only thing to watch here is that panned centre signals may appear slightly too quiet in relation to other parts of the mix, but by listening to the programme through a Pro Logic decoder, you will be aware of any deficiencies and will compensate automatically as you mix. In this way, the normal channel pan pot can be used to pan a signal anywhere across the front three speakers, although it can be a little tricky to perform real-time pans — a point I'll come back to shortly.

## FURTHER INFORMATION

RSP Technologies Circle Surround products are available from Axis Audio Systems Ltd, 3 Waterloo Road, Stockport, Cheshire SK1 3BD (Tel 0161 474 7626; Fax 0161 474 7619).

Dolby Laboratories Products are available from: Dolby Laboratories Inc, Wootton Bassett, Wiltshire SN4 8QJ (Tel 01793 842100; Fax 01793 842101).



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One of the worst problems with this matrix system is that poorly-matched Lt and Rt levels or phase will cause excessive Centre-signal crosstalk to the Surround channel. In the cinema, this means dialogue coming from behind you — a very distracting effect indeed. To overcome this problem, Dolby included a delay in the Surround channel, so that even if there is crosstalk to the Surround channel, listeners will not hear it until

after the frontal sound has been heard. This takes advantage of something called the Haas (or Proximity) effect, where the brain manages to ignore secondary sound arrivals (at least as far as directional cues are concerned), provided there is about 20ms difference between them.

## ROUND UP

The simple DIY encoder system described in this article is a perfectly valid and practical way of experimenting with Surround mixing. I know of a number of experimental Surround-encoded TV programmes which were produced with this very system before the company in question decided to commit to the proper Dolby encoder system (for copyright reasons, you must use the Dolby encoder to be able to use the Dolby Surround logo).

Provided you always monitor through a Pro Logic decoder (or equivalent), you cannot go wrong with mixing in Surround. If your efforts don't sound right, at least you will have spotted the problem, and armed with the knowledge of how Surround works, you should be able to adjust the mix balance to fix matters. Give it a go, and enjoy the extra dimension that Surround offers, both in the production and in the listening — I'm sure you won't regret it one bit!

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

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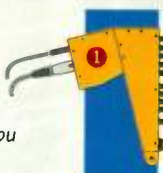
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# Short Cuts

USING SHORT DELAYS TO  
CREATE UP-FRONT AMBIENCE

**CRAIG ANDERTON** explains how you can use your multi-effects unit to create contemporary short delay treatments.

The reverb-drenched sound of the '60s and '70s is well behind us, as is the chorused gauziness of the '80s. The sound of the '90s is high-definition and in your face; you hear less and less reverb on records, whether you're listening to the Red Hot Chili Peppers or cutting-edge dance music.

You might think that recording dry, without reverb, is one way to get this effect, but we're so used to instruments having some 'air', both from resonances within the instrument itself, and from the room in which it is played, that dry recording often sounds unnatural and unappealing. Listen to a totally dry drum machine: yes, the sound is clean — but there's also a certain deadness. The stereo is too wide; drums become individual points of sound instead of being part of a cohesive, unified kit. A synthesizer or sampled keyboard — in fact, any electric or electronic sound source — suffers from similar problems when recorded dry. But when you add reverb, the effect is to distance the sound from the listener, thus destroying the up-front effect that's being sought. So how can you reconcile this desire for a current, 'in-your-face' sound with the need to give your instrumental sounds some air and stop them from sounding strange and unnatural?

Some engineers pump electronic sounds through speakers and then mic them up (not at all a bad idea, by the way), but there's a more predictable and compact way to give your electronic sounds some air: use short delays from your multi-effects unit to model a room, and create your own 'virtual room mic.'

## AMBIENCE FOR THE NINETIES

While 'modelling' is a buzzword these days, the concept has been around for a while. Any electronic reverb is essentially modelling what happens when sound waves run around loose in a room.

Recording in a very tight, sparse, hard 'box' of a room is one way to get that 'in-your-face' sound. Back in the early days of digital delay, one technique for simulating this kind of ambience was to put several delays (with delay times of 1-10ms or so) in parallel. Mixing these delays well in the background creates the 'comb filtering' effects associated with typical small rooms. Unfortunately, with today's digital multi-effects, the room, plate, spring, and hall reverb simulations tend to be optimised for traditional long decays with lots of reflections, not short delays — but there is a workaround.

## HOW TO DO IT

Many multi-effects processors now offer an easy way to experiment with short delay techniques, thanks to multi-voice chorus algorithms (also called multi-tap delay algorithms). The typical multi-voice chorus or tapped delay algorithm looks something like Figure 1.

Most inexpensive multi-effects units combine the stereo input signals into mono. This signal then feeds between three and eight delay lines (Figure 1 shows a four-voice tapped delay). Each delay has controls for initial delay, feedback, level, and pan. There will also be some kind of dry level control. Multi-voice chorus units will also be able to modulate the delay times. Sometimes this controls all the delays, but sometimes each delay has its own modulation.

When patching into a mixer, you would generally drive the multi-effects inputs from an aux (or effects) send buss, just as you would a standard reverb, and feed the outputs into the aux returns. Turn up the send controls for the channels you want to process, and regulate the overall level with the aux buss return level control (remember that a little bit of this effect goes a long way).

## TYPICAL PARAMETER VALUES

Following are two programs for the Alesis Midiverb 4, designed specifically for processing drum machine sounds to make them sound more 'live' without being drowned in effect. (If you don't have a Midiverb 4, the principles also apply to other units.) Typical parameters for a program based on the Four-Voice Chorus algorithm are:

### PAGE 1 (MODULATION):

Rate	0.2Hz
Depth	255
Feedback	7%

## MULTI-EFFECTS FOR MUSICIANS

Craig Anderton's book *Multi-effects For Musicians* provides advice on what to look for when buying a multi-effects processor, and features lots of practical tips on using and making the most of these essential studio tools. It's available from SOS Mail Order and costs £10.95 plus postage & packing (£2.50 UK, £5.50 Europe, £8.50 rest of the world).

Multi-effects for Musicians, order code B306; please see the Mail Order pages in this issue for ordering details.

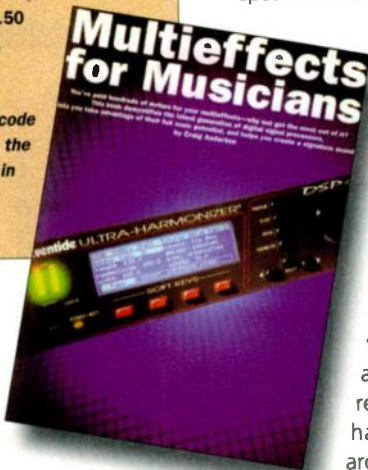
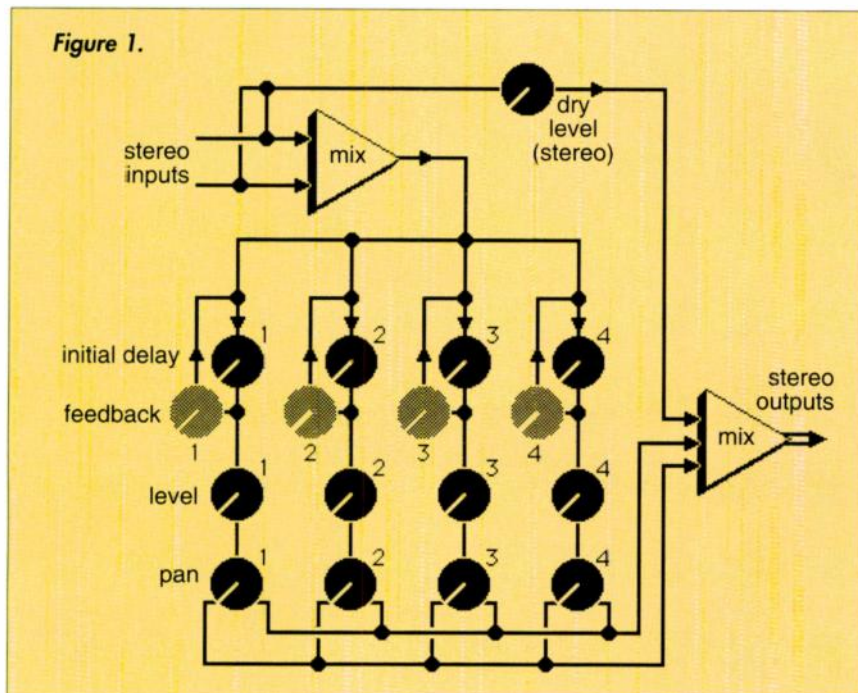




Figure 1.



**PAGE 2 (DELAY TIMES):**

Pre-delay 1	1ms
Pre-delay 2	2ms
Pre-delay 3	3ms
Pre-delay 4	4ms

LowCut Filter	177 Hz
Hi Cut Filter	15.1 kHz
Mix	(-)

**PAGE 3: DRY ONLY (-)**

**NOTES**

- This creates a tiny, dry room effect.
- The very slow modulation adds a bit of animation that dynamically colors the sound.
- For a more static sound, set the depth to 000.
- To change the room characteristics, try various other pre-delay times between 1ms and 10ms (the combination of 005, 007, 008, and 010ms works well).

The next program uses the Midiverb 4's Tapped Delay algorithm (and again, it can be modified for your own multi-effects processor). Although with the Midiverb 4 this has only three taps, compared to four for the chorus, each tap has more flexibility. Use these values as a point of departure:

**PAGE 1**

Time 1	005
Level 1	99
Pan 1	-50
Feedback 1	00

**PAGE 2**

Time 2	007
Level 2	99
Pan 2	50
Feedback 2	00

**PAGE 3**

Time 3	003
Level 3	99
Pan 3	00
Feedback 3	00

**PAGE 4**

Master Feedback	50%
-----------------	-----

**NOTES**

- Master feedback is set to 50%, so if you want to experiment with individual feedback taps, turning them up just a little bit gives an audible effect.
- The low-cut filter is handy for keeping the kick drum out of the ambience effect, thus giving a stronger 'thud'.
- This program seems to work best with the short delay panned centre, and longer delays panned left and right. Of course, more expensive units with more taps let you create correspondingly more complex ambiances.

**THINGS TO WATCH OUT FOR**

If you turn up the aux returns to obtain lots of processed signal, beware of phase cancellations. Although the whole point of this exercise is to add the phase cancellation/addition effects found in the average room, high levels of processed signal can cause excessive cancellation. Check the signal for mono compatibility.

Another consideration is that this technique will tend to 'mono-ise' the signal and make the stereo spread less obvious. Frankly, I consider this a benefit, as it provides an overall sonic ambience for the drums.

Finally, note that these delays can sound good on vocals, but there's still nothing like a nice, warm chamber for wrapping around a voice. I always have at least two reverb devices available — one to create these short, ambient delays, and the other to provide a more traditional plate sound for vocals. This gives the best of both worlds.



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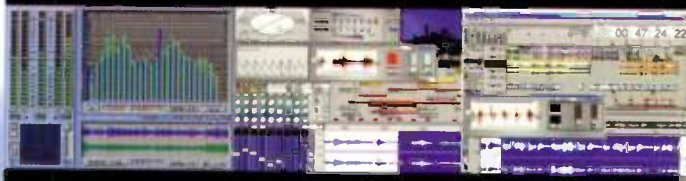
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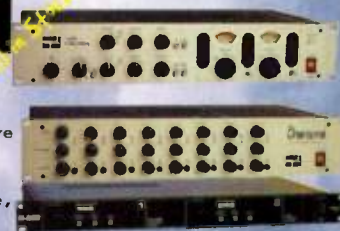


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# Speech

RECORDING THE SPOKEN VOICE

# Therapy

**T**he spoken voice is something most people take for granted, but recording a voice properly is certainly not the trivial task many people assume it to be, and there are just as many traps and pitfalls for the unwary as in any other recording situation. In fact, the spoken voice is, in many ways, far more demanding of studio acoustics, microphones, recording equipment and the expertise of the engineer than the singing voice. The reason for this is quite simply that a singing voice is, more often than not, accompanied by other instruments and processed to some degree with reverberation, both of which tend to mask minor deficiencies in quality.

In the case of a spoken voice, any unnatural coloration (perhaps from room acoustics, bad mic technique or a low-quality microphone) stands out, because we are all very used to hearing human voices and can spot anything 'wrong' extremely quickly. Likewise, heavy compression may be applied to a singing voice to provide control and keep it at the top of a mix, but with the spoken voice, even relatively small amounts of compression can be very obvious indeed.

## THE SOURCE

As with any instrument, placing a microphone too close to the source of a spoken voice will 'distort' the sound, because it won't capture all elements of the sound in the correct balance. Moving the microphone further away will usually achieve a better, more natural sound quality, but also captures more 'room sound', which may not be acceptable.

A human voice (whether speaking or singing) has three sources contributing to the complete sound: the chest, the mouth (including teeth and lips), and the nose.

• **CHEST:** The chest is basically a large resonant cavity, and this accounts for a lot of the lower frequencies in the voice. Just place your ear on someone's chest while they talk to see how significant this element actually is (better ask their permission first!). Both the front and the back of the chest cavity vibrate, and being at a fairly low frequency, this part of the sound will tend to travel as a 'spherical wave' which means that it will radiate out in all directions.

• **MOUTH:** The mouth, teeth and lips are responsible for the main articulation of words, and produce mainly mid and high frequencies. These tend to promulgate as 'planar waves', which means they spread out slowly with increasing distance, but primarily travel in the direction the mouth is facing. In other words, this element of the voice is only available in front of the person speaking, not behind or to the sides.

One of the biggest problems when recording a voice is that of 'plosives' — the 'P's and 'B's which

create a distinct blast of air, often causing the microphone diaphragm to bounce off its end-stops! You can feel the strength of the wind blast by placing your hand in front of your mouth and saying a few P's and B's. Although you will probably not be able to feel the blast on your hand more than a few inches away from your mouth, there is often enough energy to upset a microphone up to a foot or so away. Fortunately, these plosive blasts are remarkably directional, and tend to occupy a relatively narrow 'corridor' extending directly forward and usually slightly downward from the mouth.

• **NOSE:** Few people associate the nose with talking or singing, but you only have to suffer a heavy cold to realise how important its contribution is. Very little actual sound is generated, but there is a surprising amount of 'wind' — not from speaking, but from breathing, and from some characteristic mannerisms, such as a 'humph' reaction to a comment, or a 'snorting' laugh. These actions generate wind blasts which are very similar to plosives, but are generally directed straight down and are only likely to cause

*Experienced engineers know that recording the spoken voice properly is actually more difficult than recording a singer. HUGH ROBJOHNS explains why this is so, and passes on some hints and tips for developing a good technique.*



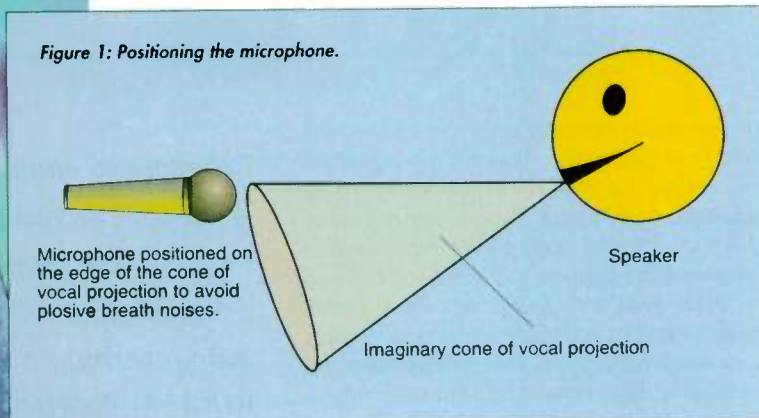


# RECORDING THE SPOKEN VOICE

- ▶ problems if the microphone is very close to the mouth, or is mounted on the chest (a personal microphone on a tie-clip, for example).

## THE SWEET SPOT

The ideal place for a microphone will vary considerably with the speaker and the location. However, there are some guidelines which may be deduced from the description above about where



the voice comes from. Firstly, there's no point in putting the microphone behind the speaker, since the only element of sound to travel in that direction is the low-frequency chest resonance — so it has to be around the front somewhere. This may seem like an obvious statement, but it's always worth thinking these things through logically.

The only real problem area in front of a speaker

is directly in front of the mouth, where plosives will cause unacceptable pops and thumps. A good guide to finding a position for a microphone is to imagine a large cone (like a megaphone) with the pointy end attached to the mouth and facing straight ahead for about half a metre or so. A microphone will usually give good results if placed anywhere on the circumference of the wide end of that imaginary cone (see Figure 1), although the furniture and room acoustics may make some positions better than others — a point I'll return to shortly.

## CHOOSING A MICROPHONE

Each type of microphone has its own blend of characteristics, and selecting a microphone is as much an artistic decision as a technical one. Different situations, voices and acoustics will affect the decision, but there are no absolute rights and wrongs. Try different mics in different places, and resist the temptation to reach for the EQ to try to create a sound you like. As always, it pays to get the right microphone in the right place. Fistfuls of EQ rarely produce a satisfying solution and can often lead to other problems.

If you surveyed every studio in the land about their favourite microphone for voice work, probably 90% would specify a large-diaphragm condenser (or capacitor) microphone. The size of the diaphragm has a subtle but important effect on recorded quality, which seems to be particularly appropriate to the human voice. Most large-diaphragm condenser microphones also have switchable polar responses, which makes this kind of microphone a particularly appropriate choice for voice work. Suitable voice microphones include top-end ones such as the Neumann U87, TLM170 and KM(S)84, or the AKG C414. Condenser microphones with valve head-amps have always been a popular choice too, and although vintage valve microphones are both rare and expensive, there are an increasing number of modern valve microphones available, such as the Rode Classic.

If your budget doesn't stretch to a condenser mic, there are still a number of options available in the dynamic and electret categories. Electrets essentially operate in the same way as condensers, but are considerably cheaper to manufacture (which is handy, since their life-span is strictly limited!). Although most electret microphones have relatively small diaphragms (extremely small in the case of personal mics — see 'Personal Mics' box), they share many of the same useful qualities as condenser mics, especially in their extended, smooth high-frequency response, which helps to convey naturalness and clarity.

Dynamic microphones have a lot to offer and should certainly not be ignored. The BBC, for example, often uses a ribbon microphone (whose design can be traced back to the 1940s) for voice work, especially in the studios of the World Service. The microphone in question is an STC/Coles 4038, which has a fantastically accurate figure-of-eight polar response and an extremely light ribbon diaphragm, exhibiting many of the same sonic

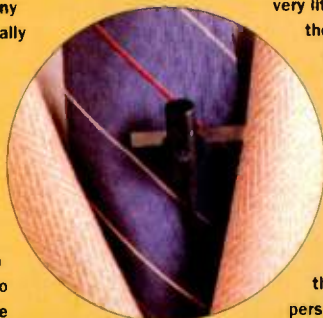
## PERSONAL MICS

If you've ever watched TV, you will undoubtedly have seen people wearing 'tie-clip' or 'personal' mics. In general these are used for their aesthetic appeal rather than for reasons of high sound quality, although to be fair, many current personal mics are actually pretty good.

The chest cannot be considered as the ideal position for sound pickup, and manufacturers of 'personal' microphones have to doctor the frequency response of the microphone in a fairly serious way to create an acceptable sound. There are two major problems: firstly, the close proximity to the chest cavity produces a disproportionate amount of low-frequency sound; secondly, the microphone 'sees' very little of the sound output from the mouth, so would tend to sound dull and inarticulate. Typically, personal microphones have an extremely 'non-flat' frequency response, to overcome this problem, generally rolling off low frequencies (to regain an appropriate balance) and boosting middle and high frequencies to extract the best articulation and detail.

Place this type of microphone anywhere other than on the chest and the sound quality will

change radically as a result. The classic example is probably in theatre and costume drama use, where microphones are often hidden in the hair or wigs. In this situation, much the same high-frequency boost characteristic is needed as if it were mounted on the chest but there is very little low-frequency pickup from the head, and the mic's LF roll-off exacerbates the problem, often needing extreme amounts of EQ from the mixing desk!



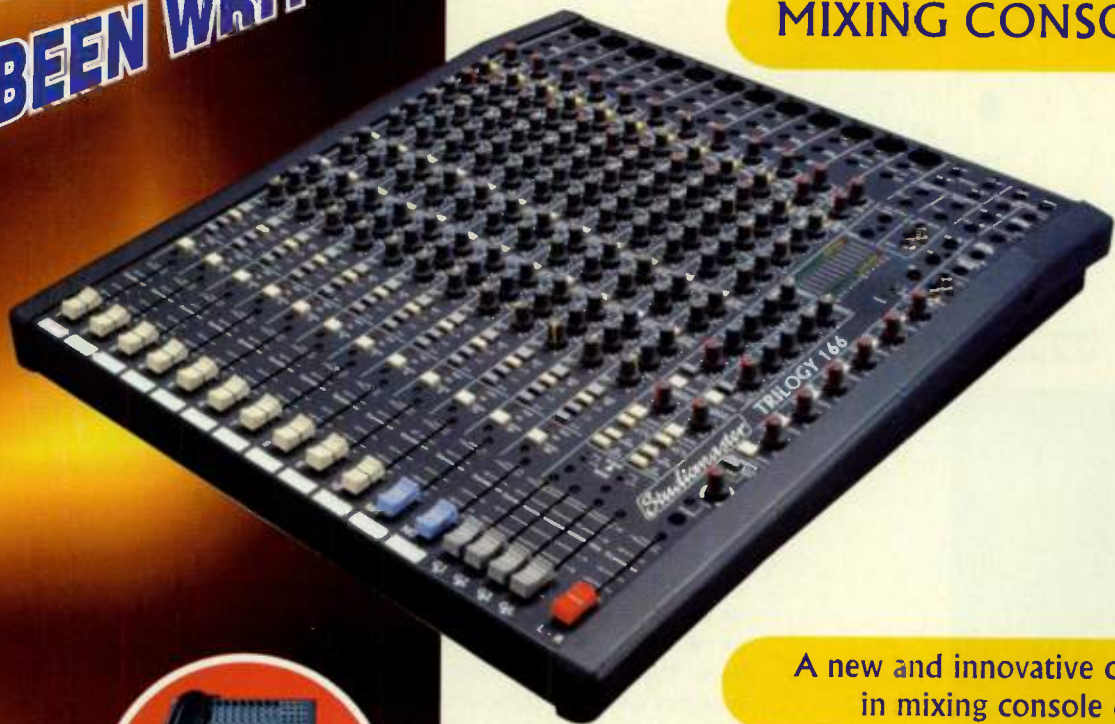
One thing you may have noticed about tie-clip microphones is that they often appear to be mounted upside down (with the wire coming out of the top rather than the bottom). Virtually all personal mics are omnidirectional, and their very small size means that their frequency response remains remarkably constant from the front or back, so mounting the mic upside down does not change the sound quality in any appreciable way. However, this does protect the diaphragm from wind blasting. Remember my earlier comment about wind-blasts from the nose, which travel straight down? A personal mic is almost inevitably positioned directly in the line of fire but by turning the microphone over, you can protect the diaphragm from this kind of abuse!



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## RECORDING THE SPOKEN VOICE

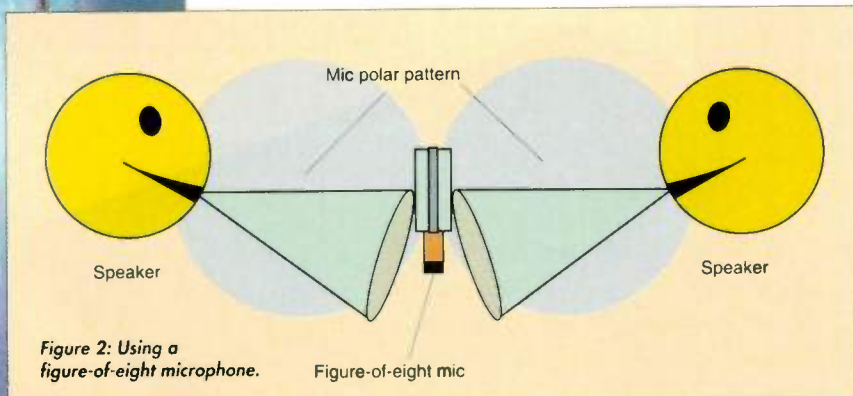


Figure 2: Using a figure-of-eight microphone.

- ▶ qualities as a good condenser microphone. Typically, the 4038 is positioned between a pair of speakers (the human kind, not the monitor kind!), each being captured by their own figure-of-eight lobe (see Figure 2). The correct balance between the voices is achieved by moving the microphone along an imaginary line between the two people, closer to the weaker voice and away from the louder voice. This may seem a crude technique, but it produces excellent results, which always sound natural and well balanced.

Moving-coil microphones tend to have a slightly dulled sound quality compared to both ribbons and condensers, because all that copper wire glued to the back of the diaphragm slows it down a bit! However, this is not necessarily a disadvantage, and moving-coil microphones are often used for voice work, especially where robustness and reliability are important considerations. The ElectroVoice RE20, for example, is a large, robust moving-coil microphone which can be frequently seen in use as a DJ microphone in American radio studios. AKG D202s and D222s, and Beyer M201s are also very popular for voice work.

The one kind of dynamic microphone best avoided for the spoken voice is the stage vocalist mic — designs like the Shure SM58 or the Beyer M88 (see 'Vocalist Mics' box).

### COMMUNICATION

The voice-over studio is a lonely place when there's only one performer. Always try to let the performer know what is going on in the control room over a talkback system. Many engineers set up an open talkback system between them and the artist as soon as the tape stops rolling, just so the performer knows that there's still someone out there! Similarly, it is important that the artist knows when his or her words are being recorded and when the reading is a rehearsal.

Ideally, the studio configuration will allow the performer to see the control room through a window. However, when you set the studio up, avoid positioning the artist so that the engineer (or producer) falls directly on the same eye-line as the script. Sudden movements in the control room (or inappropriate facial expressions like smiles and frowns) are likely to cause stumbles in the reading or performance. It's far better if the performer has to turn his or her head to the side to see into the control room — not so far that it is difficult or uncomfortable, but enough to prevent the view from falling within sight whilst looking at the script.

### POLAR RESPONSES

The polar response of a microphone is determined by the mic's physical construction. There are basically just two forms: a sealed box with a diaphragm on one end (much like a drum) is called 'pressure operation' and produces an omnidirectional polar response (picks up sound equally well from all directions). This is the simplest kind of microphone to design and build, and usually provides a very smooth, extended and even frequency response. The other form of construction supports the diaphragm top and bottom, leaving it open to the air on both sides. This is called 'pressure gradient' operation and produces a figure-of-eight polar response (picks up sound well to front

and back, but rejects sounds coming from the sides). This design is far from simple and suffers a whole host of mechanical and physical problems, which manifest themselves operationally as extreme susceptibility to handling noise, rumble, sensitivity to wind, and a tendency to emphasise low frequencies when close to the sound source (known as the proximity effect, or bass tip-up). However, these problems, though important, are overwhelmed by the advantages associated with a microphone which is able to reject sounds from specific directions.

The most common and popular polar response is undoubtedly the cardioid (picks up sound mainly from one direction) and, to a lesser extent, the hypercardioid. This type of polar response is created by combining both forms of operation (pressure operation and pressure gradient) within a single unit. Consequently, cardioid and hypercardioid designs also suffer from the handling, rumble, wind and proximity effects of figure-of-eight mics, although not usually to quite the same degree. So what does all this mean in relation to positioning a microphone to record a spoken voice?

Most importantly, anything other than an omnidirectional microphone will generate increasing amounts of bass the closer it is to the speaker. With a directional microphone designed for a flat frequency response at distances of a foot or so, the proximity effect can be deliberately used to create a 'warm' sounding voice, but use this trick with care, as increased proximity can also lead to increased popping. The classic deep and rich 'advertisement voice-over' sound relies directly on the proximity effect.

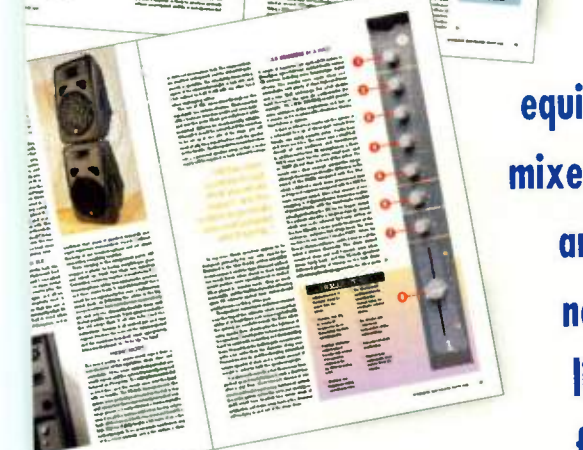
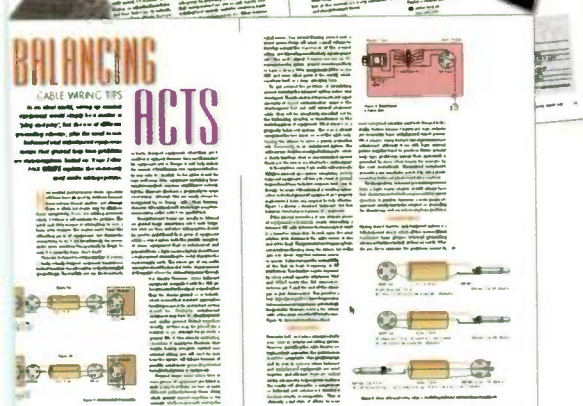
Other than making deliberate use of the proximity effect, directional polar responses should be chosen to control and reject sound reflections from the studio furniture, scripts (paper can reflect a surprising amount of sound), control room window and room acoustics. Consider all reflective surfaces carefully, then position the mic (and select its polar response, if you can) to achieve the best isolation between voice and reflections. I'm assuming here that the room sound is not an artistic part of the recording, which is normally the case — the voice is wanted 'dry'. However, there are cases when the room sound is important (radio drama, for example), so the techniques should be modified accordingly.

In an ideal, well-treated room, reflections will not be a problem, and in this case, an omnidirectional microphone is usually the best choice, since its inherent design has far fewer compromises and almost always (in my opinion, anyway), sounds better than a directional microphone.

### MULTIPLE MICS

If there are two or more people talking, it may be possible to arrange them so that they share the useful part of the polar response of a single microphone (as in the case of the BBC's 4038 ribbon mic). This should be the first approach, because the more microphones there are, the more room sound will be heard and the harder it will be to balance them.





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## VOCALIST MICS

Vocalist dynamic mics like the Shure SM58 and Beyer M88 are designed to be used extremely close to the mouth, in order to get enough separation between the voice and spill from the backline instruments. They are also of cardioid or hypercardioid polar response to reject foldback from the monitors.

The polar response means that they inevitably suffer bass tip-up or proximity effect (made worse by using so close to the mouth) and consequently, manufacturers engineer the frequency response of this type of microphone to fall away rapidly below 200 or 300Hz, relying on the proximity effect to restore an acceptable bass balance in use.

If this kind of mic is used more than an inch or two away from the mouth, there is little proximity effect, so when used at a more discreet distance, the sound becomes extremely thin and lacking in bass. Another reason why these microphones are not suited to spoken voice work is that they often have uneven mid-band frequency responses, which are intended to help vocal clarity in a PA situation, but merely add coloration to a spoken voice.

► Often it is necessary to use additional microphones, but try to avoid having all microphones fully open at the same time. Ideally, only one microphone should be 'open' at any time, the others being partially faded down (typically about 5 or 10dB) to avoid distant pickup and excessive coloration. Don't close the other mics completely, because as they are opened and closed, the room sound will change.

Driving the faders in this way is an acquired skill, and if a fader is opened late, it is usually extremely obvious. The first part of a successful technique is to always watch the person (or people) not currently talking. There are usually subtle clues when someone is about to talk, perhaps in their eye contact with the current speaker, perhaps in the way they draw breath or wet their lips, and these clues will allow you to anticipate them and open the correct microphone. Secondly, you need to develop a physical technique which allows you to rapidly open and close multiple faders with very precise positioning.

These techniques must be practised over and over again to develop the necessary level of skill, but it is worth it. Automatic devices like gates and expanders can not achieve anything like the same level of subtlety, and usually do more harm than good, because they always miss the initial transients as they open a microphone channel!

## FIXTURES AND FITTINGS

Spoken voice recording usually involves the speaker sitting at a table with a script, but don't be afraid to ask the speaker to read standing up — this usually improves breathing and posture and the results can often be heard. It also avoids the reflective problems of a table.

If a table is to be used, it should be chosen with care, since it will be perfectly placed to reflect the voice back up to the microphone, resulting in coloration. Also think carefully about where to

put it in the room, and try to keep it away from walls (or control room window) to avoid horizontal reflections back to the microphone.

A professional acoustic studio table is not load-bearing (never try to sit on one!) because the top is made from perforated hardboard covered in thick felting. The felt absorbs high frequencies and the low frequencies pass straight through the table, so nothing should be reflected back up to a microphone. If the script is laid on the table, this will form a reflective surface, so professionals usually use a script rack to angle the paper and aim reflections away from the microphone. Again, think carefully about where you position the mic to avoid reflections, and also to avoid wind-blasts and other noises from turned script pages.

The script rack has another important advantage, which is that it helps to keep the reader's head up. If the reader is continually moving his or her head whilst reading (looking up when familiar with the words, but looking down to read from the script), the sound quality will change dramatically. If you want proof, listen to the sound quality changes on a television news-reader's voice when they read out-of-vision (narrating a filmed insert, for example). When a TV presenter is in-vision, they usually read from the tele-prompter on the front of the camera, but when out-of-vision, most look down to their scripts.

If there are two or more people talking, position them to provide a comfortable eye-line, and arrange the microphones so that their polar responses reject the unwanted speakers. The further apart they are, the easier it will be to balance the microphones, but don't take this to extremes — increased distance will tend to make them raise their voices, causing stronger room reflections!

## SIGNAL PROCESSING

As with most mic techniques, if the right mic is in the right place, with the performer in the right part

## MAKING A VOICE BOOTH

A studio designed specifically for recording speech (or a dedicated voice booth) has two key features:

- Firstly, it should be relatively free of reflections so that the recorded voice has no discernible reverberation. Studios designed for this kind of work (as opposed to any kind of music studio) would typically have a reverberation time of about 0.3 seconds.
- Secondly, the studio should be free of any ambient or external noise (typically specified as a 'Noise Criteria' of NC20 — which, loosely translated, means 'extremely quiet!'). A quiet studio is very important for speech work, because the spoken voice is a relatively quiet sound source, and there are unlikely to be other sounds to mask background noises such as road traffic. Creating a truly quiet studio can be

difficult and extremely expensive. Box-within-box constructions, where a small studio or voice booth is built within an already quiet room can be a great help, but are far from cheap. A more pragmatic solution might be to find a room in a quiet location in the first place, and then make the actual recording in the dead of night! Wherever you end up recording the voice, pay particular attention to any kind of background noise — particularly if you will be editing re-takes into an earlier master recording. Abrupt changes in background 'atmospheres' are usually pretty obvious to the listener.

Fortunately, dealing with a reverberant room is a little easier and cheaper. An average-sized, well-furnished living room will already have a reverberation time of about 0.4

seconds, and making the room even dead is simply a matter of covering an increased proportion of the reflective surfaces with absorbent material (try drawing the curtains, for example). Fortunately, for the human voice, the most critical frequency range, as far as reverberation is concerned, is between 500Hz and 2kHz. Carpets are pretty good at soaking up energy in this region, so you can easily control reverberation by hanging old carpets on the walls (it will give your studio the 'Medieval Castle' look too!).

If you want a more professional look to the walls, there are a wide variety of acoustic foam tiles available (Canford Audio sell both their own make and the highly recommended German Ilsonic tiles — call them on 0191 415 0205).

If you don't want to go to all this trouble, there are a couple of alternative ideas that might work to an acceptable level. The first is to place the absorbing

sides of a couple of acoustic screens at the sides of the microphone, forming a 'V' shape with the wide end where the performer will be. The idea here is to stop any reflections from getting back to the microphone. (If you don't have acoustic screens, try the old carpets again!). One last idea (and I don't recommend you ask a professional voice-over artist to play along with this one) simply requires a large and heavy overcoat. Drape the coat over both the performer and the microphone (a second mic-stand to hold the coat clear of the microphone is a good idea) and voila!

Before you roll about on the floor in fits of laughter and total disbelief, I've seen many seasoned professional reporters use this very technique in the back seat of the crew car, when recording their voice-overs to a late news story. One last word of advice though: have a torch handy.... it's hard to read a script in the dark under a heavy coat!



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## RECORDING THE SPOKEN VOICE

► of the right acoustic environment, the sound will be perfect! But in an imperfect world, some form of signal processing may be necessary.

• **Gentle compression** is often used on a spoken voice to help improve intelligibility and reduce the dynamic range slightly (especially in the case of radio drama). Try to avoid limiters if possible, as these tend to sound rather obvious because of the unnatural step-change in dynamics. If you do use a limiter, keep the gain reduction below about 4dB to avoid the most obvious audible effects. Gentle compression at 2:1 or 3:1 is far better (going up to 5:1 if the speaker is particularly dynamic!) with a low threshold so that everything is squashed gently. Personally, I prefer to insert the compressor ahead of the equaliser whenever possible, but if the equaliser is up-stream of the compressor, be aware that altering the EQ settings will upset the compressor thresholds! This is not such a problem with gentle compression slopes, but can become significant if you are using limiters.

• **EQ** should always be used with care in any circumstances, but particularly so with a spoken voice, because coloration can be detected so easily. A high-pass filter to remove deep bass is often very helpful in minimising the audible effects of popping and wind-blasting, and removing any exterior noises such as traffic, air-conditioning and so on (there is very little voice content below about

80Hz in most cases). A very gentle upper-mid lift around 2-6kHz can help to improve clarity and brighten up moving coil mics if needed.

• **Beware de-essers!** I have never found them particularly effective at reducing spoken sibilance, and they're extremely time consuming to set up. It's far better to re-position the microphone, change the mic type (for a moving coil, perhaps) or even change the speaker if you have a serious problem with sibilance!

• **Reverberation** is not often needed on a spoken voice (other than for dramatic effect), but small voice-booths are often excessively damped and sound extremely dead. A tiny amount of a 'small room' reverb program may help to make the sound more natural — but be very careful not to overdo the effect. If other listeners are aware of it, you've used too much!

### THE BOTTOM LINE

The spoken voice is a very critical sound source, purely because everyone knows what a voice is supposed to sound like. Mechanical and electrical colorations are very obvious, even if the particular voice is unknown to the listener. As always, take the time to experiment with different microphones in different positions, and try to get the best possible sound from the studio environment before resorting to signal processing.

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

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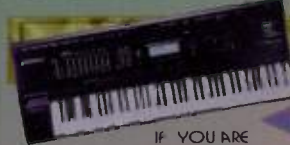
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DIGITAL MINIDISC IN A 4 TRACK MIXER/RECORDER!! YOU CAN BOUNCE DOWN AS MUCH AS YOU LIKE WITH LITTLE OR NO SIGNAL LOSS - WOW!!!

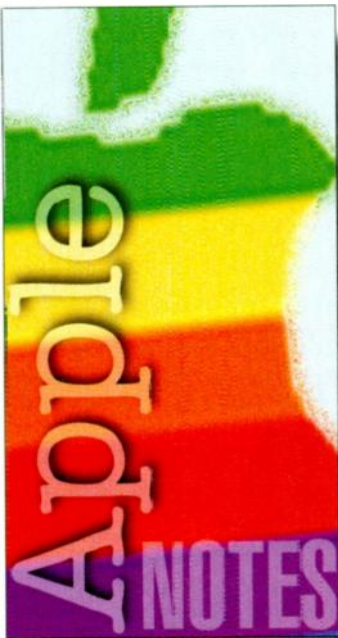


PC/MAC SOFTWARE

**MEGA**

WE HAVE ALL THE LEADING SOFTWARE FOR BOTH MAC AND PC - CALL US NOW!





**This month MacOS evangelist MARTIN RUSS reports back from the recent optimistic Apple Expo show, and dishes out some more tips on file management.**



**T**his year's Apple Expo was a stunning contrast to the doom and gloom of a year ago. With a re-invigorated Apple and a host of exciting products, the show was noisy, frenetic and crowded. In fact, it was so busy that I never actually managed to bump into one of the people that I had arranged to meet there! Sorry, Paul.

On the music front, Lars from MCMXCIX was busy demonstrating Opcode and Coda music software, and a number of new releases from Opcode caught my eye: *Studio Vision 3.5*; *MusicShop 2.0*; *Overture 2.0* and *Max 3.5* (more on these when I have a chance to look at them in detail). Lars also gave me a sneak preview of the new Studio 64X MIDI interface. The leap in numbering from the Studio 4 and 5 does not mean that this is a truly huge interface, but instead, the name of the device refers to the number of MIDI channels it offers: 64 from four input ports or six output ports. With MacOS and Windows cross-platform compatibility, programmable patchbay and SMPTE synchronisation features, the Studio

64X might well bring Bill Gates lovers and haters together for once.

A few feet from Lars's corner, there was a large monitor around which a skilled and voluble demonstrator was extolling the virtues of music software packages. In marked contrast to just about every other stand, MCMXCIX were making a brave attempt to let people know that MacOS computers are an excellent choice of platform for making music. Full marks to them for not hiding all of the music stuff in a quiet backwater!

## CLONES

Each year, the Apple Expo has a fascinating tendency to theme itself. In previous years, large colour printers, CD-ROMs and the internet have been the predominant subject. I don't think this is planned: it just seems that technologies have a tendency to cluster. This year the unplanned theme was very obvious: clones. For a computer which has only been available from one company until very recently, the sudden appearance of half a dozen or more alternative sources is quite stunning. Although the big names like Power Computing, Motorola and UMAX (SuperMac) were all represented, there were also some smaller manufacturers announcing MacOS clones (see the 'Clone Ranger' box). I bought an excellent bargain-priced 2Mb AV hard disk from one of these alternative clone-assemblers — they hailed from an industrial unit in Leeds and had one of the smallest stands at the exhibition. I can't think of a bigger change from the 'no clones' attitude of only a couple of years ago. It

## CLONE RANGER

Companies who have announced Mac clones based on the MacOS and PowerPC chip include:

- Daystar Digital
- Radius
- Power Computing
- Umax (SuperMac)
- Cutting Edge
- Rack Systems

can only help the MacOS platform when small enthusiastic companies are willing to put together 'Mac' clones.

If there was a sub-theme to the show, then it had to be the sudden price wars for MacOS computers. Combined with ever-higher clock speeds, the combination of computing power and low prices should encourage more people to buy MacOS computers. Don't forget that a PowerPC chip running at 180MHz can do more processing work than a Pentium Pro chip running at 200MHz!

Some people might argue that the really predominant feature of the Apple Expo were the low-cost colour printers. For the sort of price that buys a cheap black and white printer, you can now get a cheap colour printer that also prints in black and white. But I'm still waiting for the flashing ink so that I can print out some World Wide Web pages!

## PIPPIN

One of the most significant events for me at the Apple Expo was seeing a Pippin (first mentioned

## ON THE NET

Generally, MacOS computers tend to have Apple monitors connected to them, apart from those belonging to a minority of huge screen owners and DIY interfacing enthusiasts. A host of TV/monitor-related hassles can await the unwary user who attempts to connect an incompatible screen, with the result that most buyers purchase a plug-and-play Apple device.

So, it came as quite a surprise when I heard about Paul Lehman's article in this month's *SOS* [see page 76 — Ed]. I hadn't heard of Griffin Technologies, Inc. But after a quick search on the Internet, I have now. The company produce an astonishing range of adaptors, tweekers and general interfacing boxes which can make a large range of non-Mac multisync monitors Mac-compatible. All in all, the Griffin web site is a marvellous 'net resource that is well worth a visit — even just to see what is possible.

Once hooked into searching for Mac monitor resources, I found several other WWW sites which might be of interest to anyone with an interest in

large heavy boxes which whistle and have high voltages inside. As usual, here's a list of places to visit:

- GRIFFIN TECHNOLOGY VIDEO ADAPTORS AND CABLES

<http://www.nashville.net/~griffin/video.html>

- GRIFFIN'S MAC MONITOR DATABASE

<http://www.nashville.net/~griffin/monitor.html>

- MONITOR ADJUSTMENT INFORMATION

<http://filter.stanford.edu:8080/projects/mac/monitor.html>

- HOW TO TWEAK HITACHI 19-INCH FIXED

[FREQUENCY MONITOR HARDWARE](http://rugmd0.chem.rug.nl/~everdij/hitachi.html)

<http://rugmd0.chem.rug.nl/~everdij/hitachi.html>

- SCI ELECTRONICS' FAQ ON MONITOR REPAIR

[http://www.paranoid.com/~flipg/HTML/REPAIR/F\\_mon\\_repair.html](http://www.paranoid.com/~flipg/HTML/REPAIR/F_mon_repair.html)



## MORE MAC-RELATED WEB SITES

- **MOTOROLA'S POWERPC HOME PAGE**  
http://www.mot.com/SPS/PowerPC/
- **POWER COMPUTING CORPORATION**  
http://www.powercc.com/
- **SUPERMAC**  
http://www.supermac.com/
- **DAYSTAR DIGITAL**  
http://www.daystar.com/
- **BE, INC.**  
http://www.be.com/
- **POWERPC MAC CLONES & OTHER SYSTEMS**  
http://www.clock.org:80/~fair/powerpc.html
- **APPLE MACOS LICENSING R & D**  
http://chrp.apple.com/

way back in March 1995's Apple Notes): an Apple person even held one up in a presentation to show to the crowd. Pippin seems to have evolved from being a superior games console, as was originally envisaged, into a mix of audio CD player, multimedia station and Internet console — a home computer without the complexity or the high price. Whereas all previous Apple products have had an Apple symbol on them, the Pippin's technology is licensed to other manufacturers. Cynics might well say that Apple should have done this with the Mac years ago...

Finally, amidst all the clones and licensed technology, there was the BeBox: a computer based on the PowerPC chip (several at once, which is something which Apple is rumoured to

## APPLE NEWS IN BRIEF

### • DESIGNER MACS

After a few years in the design doldrums, Apple seem to be ready to take the lead again. The latest CD-ROM-equipped PowerBooks are just playing catch-up, but some radical designs are beginning to appear: the clam-shell palm-top computer is one of them, but a book-like 'flat Mac' may well be another. The days of huge, heavy colour monitors may be numbered...

### • NOW WE ARE 20

In case you missed it, 1996 was the 20th anniversary for Apple Computer. Presumably, next year will see a 21st birthday party!

### • YOU CAN CHANGE THE SYSTEM...

Rumour has it MacOS System 7.6 is due to be available in the US early in 1997. Watch this space...

be introducing next year) but which doesn't use MacOS. But what is interesting about the BeBox is the operating system that it does run — it's a true pre-emptive multitasking, multithreaded software system with protected memory, true virtual memory, shared application libraries and modular code architecture. Now if this was a Mac, then all that technospeak would describe System 8, aka Copland. Some people are predicting that with all the difficulties that Copland's gestation seems to be causing, a complete change to a new, legacy-free system may be a distinct possibility.

## HOW IT WORKS: POINTERS

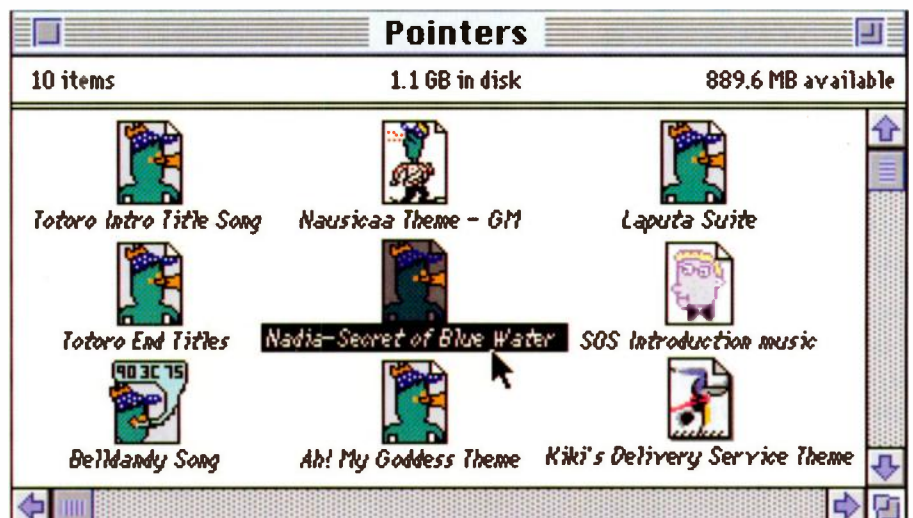
I was somewhat intrigued when someone recently attempted to sell me a piece of software which I already had — an Alias! Actually, the piece of software in question was quite a neat idea: it kept track of where all your files were so that you could find them at a later date. If you keep everything on a hard disk, the Find option in the Finder's File menu will do this, but if you have any files stored on removable media like floppy disks, removable hard disks or optical disks, you need something

a little more sophisticated. Which is where this little database comes in — it stores the locations of all the files you've used so that when you need a specific file, it can tell you that it is on the floppy disk marked 'Temporary Junk August 1994', for example.

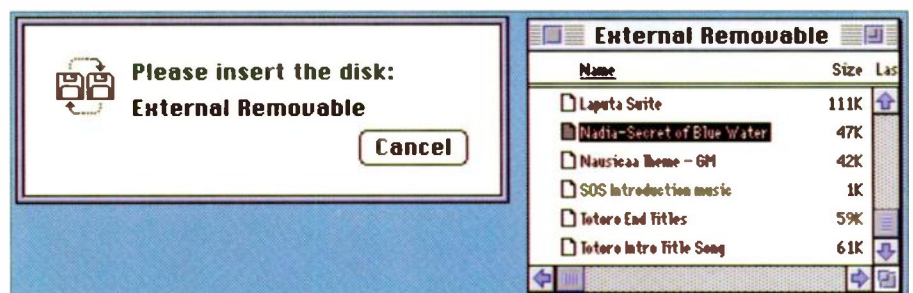
But it is possible to use Aliases to provide much the same sort of functionality — at the price of a little bit more effort. All you do is create a folder called 'Pointers' on your fixed hard disk (the one you boot up from) and then place Aliases to all your essential files in it. You can now use the Find option to search the 'Pointers' folder for the Alias to the file you're looking for. Double-clicking on the Alias when it comes up will produce an alert box asking you to insert the piece of removable storage media containing the file — which will then open. Provided, of course, that you don't call everything 'Untitled' — and you don't do that, do you...?

By the way, I haven't forgotten the ongoing 'Absolutely Essential' series, but this Alias tip seemed much more like a late Christmas present than details of which Extensions to disable.

SOS



To find a file stored on removable media, click on the file Alias in your newly-created Pointers folder...



...and a prompt will come up asking you to insert the disk containing the file!





# Happiness <sup>experience</sup> with Philips DCC

★★★★★ **18-BIT digital quality**

Oh how they panicked when DCC was launched in the musical instrument industry. 'It's not a standard format!' they cried (it is now). 'It's not true 16 bit!' they yelped (actually it's 18 bit). 'It doesn't sound the same as DAT' sneered the Luddite know-it-alls with their hearing deficiencies. If you want to know the truth, read what the press say about DCC in the extracts printed opposite. And if you want to hear the truth - just buy one.

...there's no denying that 18-bit fidelity has won the day with its superior dynamic range and mirror-image reproduction...DCC users know the system sounds every bit as good as DAT, some say 2-bits better...when all £800 buys you is a 'bottom-of-the-range' DAT the intelligent choice has to be DCC.'

18 bit recorder with digital I/O, infra-red remote, track-tilting, turbo transport, analogue cassette compatibility, traditional 700 series black-box styling. The world's best selling DCC machine.

**DCC730**  
**£249** INC. VAT

INCLUDES 5 X 90 MINUTE BLANK TAPES SAVING £35



- Buy any of these four outstanding DCC recording systems together with a DCC134 portable playback unit and save an extra £75.

- All DCC products and packages advertised here are available through a nationwide dealer network. Call **SRTL** on **01243-379834** to place your order, request literature or locate your nearest stockist.

## Special Package Deals

**DCC730 & DCC134** Includes 5x90 minute blank tapes saving in total £110 ..... **£324**

**DCC951 & DCC134** Includes 10x90 minute blank tapes saving in total £145 ..... **£354**

**DCC170 & DCC134** Includes 5x90 minute blank tapes saving in total £110 ..... **£324**

**FW68 & DCC134** Includes 10x90 minute blank tapes saving in total £145 ..... **£474**

★★★★★ **18-BIT**

# Happiness

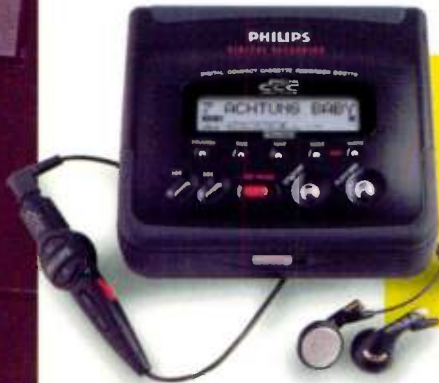
**SRTL LTD, RECORD HOUSE, EMSWORTH, HAMPSHIRE PO10 7NS**



18 bit recorder with digital I/O, Infra-red remote, track-titling, turbo transport, analogue cassette compatibility, chic and radical 900 series "Bauhaus" styling, technically identical to DCC730

**DCC951**  
**£279** INC. VAT

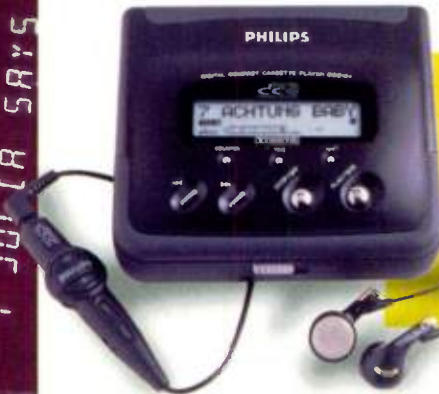
INCLUDES 10 X 90 MINUTE  
BLANK TAPES SAVING £70



18 bit portable recorder with digital I/O, wired remote, analogue cassette compatibility and stereo mic. Input - sonically identical to DCC730/951.

**DCC170**  
**£249** INC. VAT

INCLUDES 5 X 90 MINUTE  
BLANK TAPES SAVING £35



18 bit portable playback unit with wired remote and analogue cassette compatibility - sonically identical to DCC730/951.

**DCC134**  
**£150** INC. VAT

INCLUDES 3 X 90 MINUTE  
BLANK TAPES SAVING £21



18 bit Turbo Drive DCC Mini System. 2x35 watt RMS 3-way bass reflex monitoring, Bitstream CD player, analogue cassette deck, PLL quartz digital tuner, 10 band spectrum analyser, spatial surround sound and infra-red remote control. A wonderful configuration for the home recordist at any price.

**FW68**  
**£399** INC. VAT

INCLUDES 10 X 90 MINUTE  
BLANK TAPES SAVING £70

**Happiness is purity of sound**

'The recording quality is to all intents and purposes indistinguishable from DAT or CD. Indeed, if you're using the analogue input, you'll actually get a little more dynamic range than you would with a DAT machine.' *Sound On Sound*

'... it's easy to forget you're listening to tape and not a silver disc... the improved dynamics of the 18 bit system are again apparent... certainly there's no feeling that this is CD's poor relation.' *What Hi-Fi*

'...the Philips exhibited excellent dynamics and a beautifully seamless sound that caught the air and space of the hall, subjectively far superior to when it was recorded from either analogue or 16 bit CD. ...All in all, I was seriously impressed with the DCC's'. *Hi-Fi World*

'In contrast to the two MiniDisc (MD) machines, the DCC sounded bold and vital, and ultimately more engaging - there was more going on, giving the aural senses more of a workout. The treble sounded clean and crisp, without the fried-eggs quality of the MD recorders, but with plenty of detail and a more palpable sense of presence. ...the mid-band was similarly more vital and engaging. The Philips was much more consistent than the others, with none of the rather crudely-drawn quality that becomes apparent on MD when the music turns stressful... by far the best sounding of the three'. *Hi-Fi Choice*

**Happiness is picking winners**

'These new generation DCC machines start out by sampling the incoming signal not at 16 bits but at 18 bits which gives rise to a potential improvement in both dynamic range and residual noise of around 12 dB... DCC sounds just the same as DAT...The way DAT keeps going up in price, DCC could well become the home recording standard of the latter half of the nineties.' *Sound On Sound*

'...DAT is starting to get out of reach with its escalating, almost elitist price range...The DCC730 is much better and cheaper than the recordable MiniDisc; it even makes a handsome partner for a direct-to-disk system. If only you could use it to back-up data I'd give up on DAT altogether. Go out and buy one...' *The Mix*

'Philips allegedly invested £500 million in the research and design of DCC... the low cost DCC730 could seriously challenge DAT's hold on the high-tech market. ...could encourage small studios to adopt the format over the increasingly expensive DAT alternative.' *Future Music*

'I've used a good quality DAT machine for years and am no stranger to the way digital tape can render analogue sound dry and antiseptic. But the Philips simply wouldn't entertain the possibility, giving a surprisingly warm and fulsome rendition. The bass was particularly well-rounded and lacked the sense of sterility so common with digital. There was no trace of hardness higher up the frequency range.' *Hi-Fi World*

'All DCC recorders will accept a digital input at 32, 44.1 & 48khz, which is good news for anyone who wants to transfer a DAT collection to DCC. DCC's ability to handle any sampling rate you can throw at it might even precipitate a glut of second-hand DAT machines!' *The Mix*

★★★★★ 18-BIT



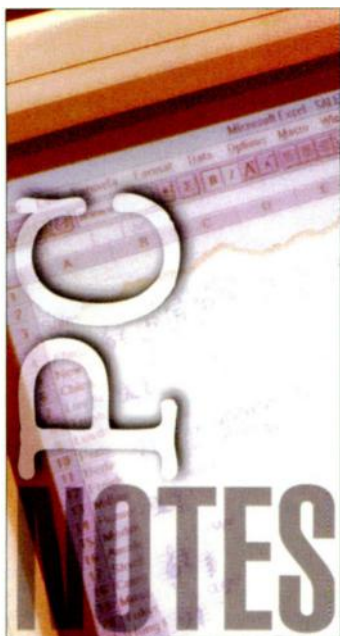
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**CALL SRTL ON 01243 379834 FROM 9.30AM TO 3.30PM FOR NEXT DAY DELIVERY**



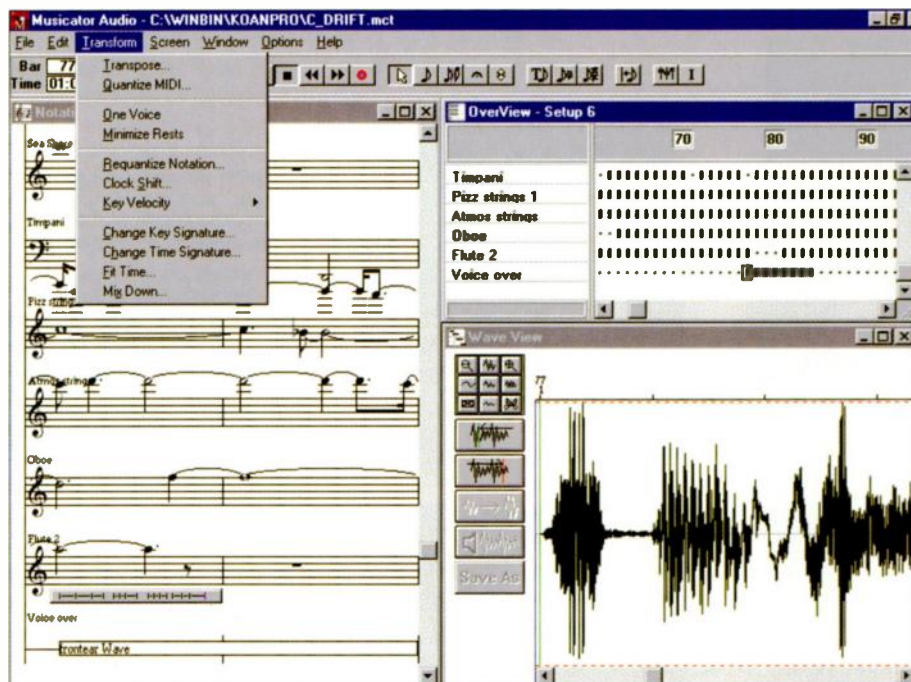


**BRIAN HEYWOOD** studio tests PC scoring/sequencing package *Musicator*, which has just gone audio, as well as handing out a few PC Notes Awards for '96...

I had a play with *Musicator Audio*, from the Norwegian company Musicator AS, last month. *Musicator GS* has been with us a while now, as a MIDI sequencing package that can also print high-quality scores, but the new version adds the ability to record and play back audio, if your PC has a suitable soundcard. While I have reservations about mixing scoring and sequencing — since the two processes have such differing requirements — I can see that musicians who are used to working with staff notation may feel more at home with a sequencer that uses traditional notation rather than 'piano roll' or event-based displays.

### ADDING AUDIO

The new version of the application has integrated MPC audio facilities into the



*Musicator Audio.*

sequencer — along the lines of *Cakewalk* and *Cubase Audio* — to allow vocals or acoustic instruments to be added to your pieces. It took me about a day to realise what an odd concept this was for a scoring program. As far as I can see, the only advantage that *Musicator* has over its competition is that you can produce high-quality scores without leaving the cosy environment of your production sequencer. And the only operation you can't perform on an audio track — unless the software is extremely clever (which *Musicator* isn't) — is to display it in staff notation. Still, if you are already a *Musicator* user and you want to take advantage of the PC audio revolution (or should that be evolution?) you may find it worthwhile

upgrading to the audio variant of the program.

I won't go into too much detail about the MIDI and scoring aspects of the program, except to say that it seems to have most of the features you'd expect to find in a decent sequencer, though the sequencer side is limited to 32 tracks, which means that no more than two MIDI ports are supported. If you think of each track as being equivalent to a musical staff, this seems a pretty reasonable limitation, but it does mean that you can't use some of the organisational tricks that make life easier when using a professional, track-based sequencer. At a number of places in the software, I felt that the basic sequencer user interface had to be bent a bit to make it fit in

## NOTABLE PRODUCTS OF 1996

This my traditional opinionated look back at products and services I have used over the past year.

- The *Someone Saved my Life Tonight* award goes to the Turtle Beach web site, for letting me download updated drivers for my TBS-2000, thus allowing one of my Windows 95 systems to work (<http://www.tbeach.com/>).
- The *Now for Something Completely Different* award goes to SSEYO's *Koan Pro*, for making a new way of creating music. Brian Eno agrees with me (or is it the

other way around?), as he used it to create his Generative Music One project (01344 712017 or <http://www.sseyo.com>).

- The *It Works First Time Out of the Box* award goes to *Cakewalk Pro Audio* v5. I recorded my first audio track approximately 10 minutes after I had finished installing the software (Et Cetera Distribution: 01706 228039).
- The *Didn't Crash (Even Once)* award goes jointly to my Soundscape SSHDR and SADIE hard disk recorders, for working perfectly all year without a

single glitch, despite running in tandem on the same 486 DX/33 PC (Soundscape: 01222 450120; Studio Audio & Video: 01353 648888).

- The *Most Useful Piece of Plastic in the Studio* award goes to the *Neato* CD labelling system from MicroPatent UK, for producing professional looking CD-Rs (0181 932 0540).
- The *I Can't Believe It's a Soundcard* award goes to the Yamaha MU10XG external tone generator, essentially a DB50XG in an external box, which not only gives superior audio quality but allows you to use reverb and chorus on the external analogue inputs.



with the scoring aspects of the application.

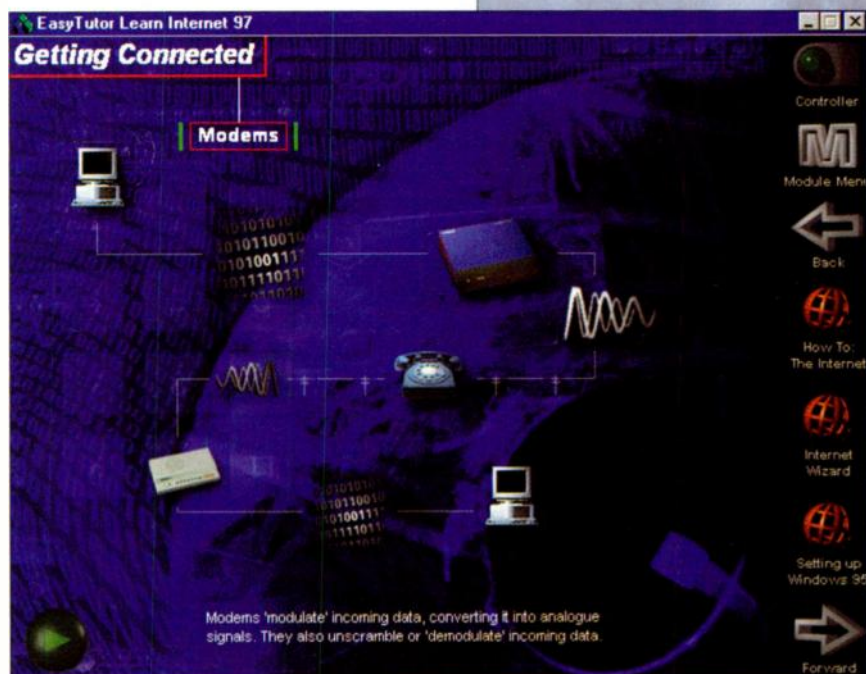
Other features include standard music notation functions that allow you to produce a professional-looking score; piano-roll editing; measure/track overview; MIDI controller windows with graphical editing of all controllers, such as aftertouch, pitch-bend, tempo and modulation; automated instrument mixer; drum mixer with individual pan positions, tuning, reverb, and volume, plus control of any GS effects. One missing feature on the scoring side is the lack of some way of inserting guitar chord symbols, although you can insert text chord symbols that will transpose with the notes when the transpose command is applied to that track. One nice feature is the ability to save the open windows and their locations, and then quickly switch between different setups with a single 'hot key'.

On the audio side, *Musicator Audio* can support up to eight independent mono or stereo audio tracks, using one or more standard MPC soundcards, although how many tracks you can use will depend on the power of your PC and the speed of your hard disk sub-system. The software allows the user to manipulate MIDI and audio data side by side in all of the edit views — notation, overview, mixer, and so on. *Musicator Audio* can take advantage of multiple soundcards, and allows you to record multiple audio tracks. I tried the software on two systems — a Pentium running Windows 3.1 and a 486DX2 running Windows 95 — and found that both systems crashed on occasion. On the Windows 95 system, the software refused to acknowledge the existence of my AWE-32's audio input, so I was unable to test the recording performance. I had no problems with *Cakewalk Audio* on the same system.

I did get a chance to record some MIDI performances, and found this task to be simple enough, though the lack of a 'play' pointer in both the score and the piano-roll windows was slightly off-putting. I did notice that some strange chord effects sometimes occurred, as if the interface was buffering up the notes played between recording sessions and then dumping them into the track when record mode was enabled — though this may be due to the AWE-32's MIDI driver. You can also record in step time, which can be a more reliable way of getting a clean score, but of course this doesn't do anything for the feel of the track.

The manual actually recommends that you

use a sample rate of 22.05kHz for all your audio tracks — other than percussion tracks — on the grounds that you won't notice the difference. I don't know if this is a comment on the quality of most MPC soundcards or the ears of the users of this software, but it firmly rules out any consideration of 'professional' results from this program. Use of lower sample



rates does save a lot of disk space, but what the heck — disk drives are getting pretty cheap these days, so I'm not sure this is a particularly good reason for reducing the quality of the music you make. The audio can be displayed as part of the score, with audio clips appearing as empty boxes; again, this is only really useful if you only feel comfortable with working in an environment that uses traditional music notation.

The mixer section handles both MIDI and audio data, giving fully automated and real-time control over the volume and pan of both MIDI and audio tracks. The mixer also allows you to control GS and GM reverb and GS chorus effects on each track, as well as playing about with the attack and decay parameters on GS voices. In a similar way to many professional programs, audio tracks can be non-destructively edited, giving control of cross-fades, track gain and mixdown, and there are also 'fit to time' and sample-rate conversion functions. The audio can either be recorded or imported from standard Windows

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Much has been said about the Internet, and you may be wondering what all the fuss is about. If you've never used a modem before (or even if you have!) it can be terribly confusing to work out whether it's worthwhile getting involved with the Internet. If you are a Windows 95 (or Windows NT)

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user, one way to get a very basic understanding of the Internet and communications in general is to get the *Easy Tutor — learn Internet97* CD-ROM. This provides a multimedia tutorial on how to connect your PC to a modem, and thence to the world via the Internet. The CD-ROM costs £29.99, and is available from WH Smith, Virgin Megastores, and various computer outlets, such as Software Warehouse.

WAV files. The program does have extensive external synchronisation capabilities, but I didn't get the chance to test it sync'ed to an external timecode source.

This brief encounter with *Musicator* hasn't inclined me to change my mind about the basic incompatibility of sequencing and scoring applications. On the whole, I'd have to say that *Musicator Audio* is best suited to existing users who want to start using digital audio in their sequences. *Musicator Audio* retails for £299.95 including VAT and is distributed by Arbiter (0181 202 1199).





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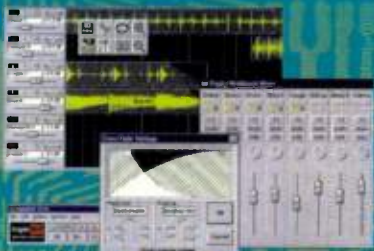
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## A HELL OF A COMPUTER

Although this could well be the fastest TOS-based computer around, the designers have made TOS/GEM compatibility a priority. The operating system is a version of TOS 3.06, which allows up to 1Gb of RAM to be fully recognised by the computer. In speed terms, the 60MHz processor behaves as if it were running at 120MHz, since it actually executes two instructions per clock cycle, and because the Atari operating system is very compact, in common with most Atari-specific software, the computer apparently actually feels as if it's running more speedily than that — System Solutions claim that the 060 Hades is roughly equivalent to a 200MHz Pentium PC.

The Hades features a vast array of ports and interfaces: it's the first TOS-compatible computer to possess four PCI slots, and is also equipped with two ISA busses, a VME buss, an enhanced IDE buss, a SCSI buss, standard MIDI interface, modem, LAN and printer ports. All that's missing is a dongle port, but an expansion card that can accommodate up to four dongles is apparently in the works. Other cards in development include an 18-bit VME audio card, with S/PDIF and AES/EBU digital connections, excellent noise figures and bundled software. Since VME-compliant products can be chained in a manner similar to SCSI, it will be possible to cascade several of these audio cards, via an external rack adaptor. The card should cost around £600-£700, with availability around March. Expect news of more developments in the near future, especially in the field of direct-to-disk digital audio. A basic Hades 040 costs £1995 inc VAT, and a Hades 060 costs £2395; for more information, contact System Solutions on 0181 693 3355, or visit <http://www.ssolutions.com/> on the Internet.

## THE SHOWS GO ON

Following the success of the London and Birmingham Atari shows run by Goodmans PDL (01782 336222) on September 28 and 29 of last year, there are plans to run another pair in April this year. Venues and dates are yet to be finalised, but once again it's planned to run a show in London on a Saturday, followed by

## QUICK TIP: CUBASE SCORE

Keychange's Barrie Heywood offers us this tip: "If when using the selector module on Steinberg's *Cubase Score* v2, you find the item line disappears, cancel the operation, go to the Modules menu and remove the file selector module. This should restore the standard file selector — at least it does on my TT." Thanks, Barrie. Anyone else got any bug fixes or work-arounds?

one in Birmingham on Sunday. There are rumblings about a possible Glasgow show, but these are as yet rather vague. We'll fill you in nearer the dates. Staying with Goodmans for a moment, the library is producing the *Atari Reference Guide to Public Domain & Shareware*. Running to 80+ pages, and presented in a loose-leaf format for easy updating, the guide will include detailed descriptions and sample screen shots of a wide range of the best software currently available. All areas of ST and Falcon endeavours will be covered, including, of course, MIDI and music. The guide will cost a mere £2.95, plus postage; contact Goodmans for details.

## TAKE YOUR ATARI FOR A DRIVE

Warrington-based Keychange Music Services, specialist in Atari hardware supply, spares and repairs, were concerned at the implications of our item regarding the SCSI Burster in last month's column. They'd like to point out that, contrary to popular belief, it is possible to add hard disks to the Atari economically without messing about with old PC cases: for example, their own ready-to-go, pre-configured hard drives start at £160 for 80-100Mb. The company also take time to gauge a customer's requirements first, regarding partition size and any additional requirements such as *NVDI*, the crucial ST screen accelerator. Keychange's drives also take up less room: a basic drive is described as "toaster size", while a combined hard drive/CD-ROM package is about the size of a standard shoe box. Keychange will also be supplying a new Mega-type external keyboard, for use with a rack-mounted ST — prices should be known shortly. Contact Keychange on 01925 266120.

SOS

**DEREK JOHNSON** plugs a Swiss TOS-based computer, reveals plans for more Atari shows, and sets the record straight on Atari hard drives...

The web site run by UK Atari specialists System Solutions got a quick mention in last month's column, but we've now had some time to explore it properly. The most interesting news that comes from the site is of a super-fast, TOS-based machine called Hades, developed by Swiss Precision in Switzerland. There are two versions — the standard 68040 processor-based machine and the even faster 060-equipped version. Swiss Precision produce the main processor board, which is then packaged by System Solutions, and the final computer can be assembled according to a customer's requirements — so if you need a huge hard drive or rack-mounting capability, the finished computer will be built to suit.

## NEWS & TIPS IN BRIEF

### • TOS 2.06 ADVANTAGES

You may recall my recent article (Long Live the ST, October 1996) where I described my reasons for sticking with the Atari ST as my computer of choice. I ordered a new 105Mb SCSI hard drive and was very happy with it. There was one inelegant niggle, which was merely that the ST needed to be booted twice to access the SCSI drive. Having now upgraded my ST's operating system to TOS 2.06, the double boot is no longer necessary. For the uninitiated, TOS 2.06 is the last operating system to appear for the Atari ST, giving many advantages

over its older incarnations. Notable improvements are the lifting of the four open windows restriction, which certainly helps when a hard drive is in use. The desktop becomes a much friendlier place to work, with a healthy array of configuration options, including the ability to link a file extension to an application program, DOS-compatible disk formatting, and function key access to specific applications. Better still, I've also found that a couple of irritating errors in Steinberg *Cubase*'s Studio module have now magically disappeared. The version of the upgrade that I bought includes a switch that sits on the side of the ST's case, allowing the older TOS

1.04 to be used should any program refuse to behave under 2.06. For anyone looking to keep their Atari going towards the next millennium, the TOS 2.06 upgrade (available from most Atari specialists) makes a lot of sense.

### • DUMP-IT UPGRADE

*Dump-It*, the utility that permits the ST to make use of those SYX SysEx files that seem to be breeding on the Internet, has undergone a transformation. From the simple send-only version, *Dump-It* has now blossomed into an all-dancing SysEx utility, with full send and receive capabilities. For a registration fee of £5, the unrestricted program will save and

load in a variety of file formats, including raw SysEx, Satellite and MIDI File, and allows the user to create a library of SysEx request commands to support any MIDI device. Other features include buffer display, data analysis and a SysEx file split capability. For such a modest outlay, this program is a well-written, useful addition to any musician's armoury and I can recommend it unreservedly. *Dump-It* is to be made available for FTP soon, but in the meantime you might like to contact Ben Hall, the author, at [benj@city.ac.uk](mailto:benj@city.ac.uk), or you can visit his personal home page (<http://www.city.ac.uk/~cb170/home.html>). Paul Ward





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# Suzanne Ciani

## RIDING THE INDEPENDENT WAVE

Despite topping over one million world-wide album sales with an established record label, America's First Lady of New Age music, Suzanne Ciani, has opted for an alternative independent route. JONATHAN MILLER asks why...



Since last time SOS talked to her, back in May 1994, US contemporary composer Suzanne Ciani has undergone immense upheavals, both musically and privately. By ending her long-standing relationship with Private Music, arguably the world's premier New Age music label, which has sold more than a million copies of her albums, some might say she is committing commercial suicide, forsaking guaranteed large recording advances in favour of going it alone.

In late 1994, Suzanne formed Seventh Wave, a new independent production company and record label in partnership with her husband Joe Anderson, who just happens to be an entertainment attorney. *Dream Suite*, their first release since the move, was recorded in Moscow with the 70-piece Young Russian Orchestra, and was nominated for a National Academy of Recording Arts and Sciences Award for Excellence (Grammy) for Best New Age Album in 1995.

### MAY THE FORCE BE WITH YOU

Never one to rest on her laurels, Suzanne has already released a Seventh Wave follow-up, entitled *Pianissimo II*. Like 1990's *Pianissimo*, for Private, it is a solo piano album and features three new compositions alongside 12 of Suzanne's best-loved melodies, including 'The Velocity Of Love,' which has come to be regarded by many as her signature theme, prompting Steve Feinstein at KKSF radio of San Francisco to observe, "As long as people fall in love, 'The Velocity Of Love' will remain one of the most moving contemporary instrumental songs of all time. Its heartfelt melody and magnificent arrangement make it a timeless classic."

*Pianissimo II* was performed on a one-of-a-kind, hand-built Yamaha CFIIIS nine-foot concert grand piano and a seven-foot Yamaha DC6 II Disklavier grand piano, at *Star Wars* creator George Lucas' prestigious Californian Skywalker Sound studio, in a "cathedral-like room." Skywalker Sound is part of the Skywalker Ranch film complex — home to those very clever Industrial Light & Magic bods, whose special effects grace many of the world's top action movies — and was reputedly built especially for popular US vocalist Linda Rondstadt.

The CFIIIS was recorded using two B&K 4006

microphones, a Boulder mic preamp, and a DCS DCS900 24-bit A/D converter, while the Disklavier was recorded using two Neumann M50 microphones. Recording was accomplished in 24-bit with a Tascam DA88 digital 8-track and a Rane RC24T PAQRAT recording converter. Coincidentally, this allows 24-bit recording in stereo on a DA88. The album was assembled and pre-mastered with the Sonic Solutions Mac-based audio editing system, which was created by James Moorer, a music software genius whom Suzanne knew from her days of studying computer music at Stanford University's Artificial Intelligence Laboratory. A Sony PCM9000 was used to finally transfer the album for mastering.

### CALIFORNIA DREAMING

Last time I interviewed Suzanne, it was in a nondescript Dutch hotel restaurant at the time of her well-received headlining concert during the 1993 KLEMDag festival. This time, though, the setting for our talk was the much more inspiring one of her ocean-side residence/studio, in the tiny North Californian coastal town of Bolinas. This undeniably quaint retreat is famed for being locked into a '70s time warp, its residents largely comprised of well-to-do former San Franciscan hippies. Not being too keen on tourists, the locals have gone as far as removing all the Bolinas road signs to prevent unwelcome visitors, but thanks to impeccable directions, I easily found Suzanne's home, where we sat down for a lengthy conversation about her new-found freedom.

"The juncture really came around the *Dream Suite* album," Suzanne began. "I was planning to do an orchestral album, and when I proposed this to Private Music they said, 'Ah, but we don't want an orchestral album.' In the past I worked very independently with them. Basically, I delivered an album once a year and that was it. My albums are like my children and it's like giving away a child. Even though Private has five of my albums I thought, 'I just can't do it.' So I found myself between a rock and a hard place, where I wanted to go forward artistically, but I wasn't willing to give the album to someone who didn't want it. Thus was born this notion of going independent, but, first of all, I had to extricate myself from the Private situation and so forth."

### STARRS IN THEIR EYES

Since Suzanne had always had a very positive business relationship with Private Music's founder





and mentor, ex-Tangerine Dream mainstay Peter Baumann, I was surprised at this unfortunate turn of events and wondered whether Peter could not have intervened on Suzanne's behalf. However, it transpired that his interest in the music industry was already rapidly diminishing, as first he made Private Music a public concern, with himself as the principal shareholder, before later selling his holdings.

Suzanne: "Peter had already pretty much

withdrawn and was no longer around. There had been a lot of changes in that label, as you can see now. Basically, they switched gears, starting out as a kind of enlightened instrumental genre label, and then they got involved with the blues. They even signed Ringo Starr! I love Ringo, but I didn't feel that the label was even going in the same direction as myself anymore.

"I've always worked as a pure artist and never written into any kind of genre. I simply do what





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# Suzanne Ciani

► I'm up to next and if my label can't support me on that fundamental level of being the artist that I am, then it's time for a divorce — no hard feelings or anything. In fact, I think that [Private Music President] Ron Goldstein was quite a gentleman in the long run, in that he said, 'If you're really unhappy, then we're not going to stand in your way.'

"I think one of the things that also made it a little bit easier for me to get out was that they would have had to pay quite a bit to keep me for the two future albums for which I was still contractually tied."

## MAKING WAVES

"Joe [Suzanne's husband] was a litigation attorney — the kind of guy who goes to court and fights for things. He was defending insurance companies and these mega-corporations against individuals and wasn't very happy about my situation. He's a powerful guy, but his first love really is music. He had a rock and roll band at that time, playing two or three nights a week in San Francisco, and he took one look at

my record contract and said, 'My god, as a labour issue, I haven't seen a contract as bad since coal mining days in Virginia!' A little button was pushed within him and he said, 'You know, this is a field that needs me.'

"There are a lot of artists out here and I know them all, and their exploitation stories are the same. So with our new label we're committed to shifting the way a record label does business — with no evidence that it could work. Maybe we'd find out that you have to exploit the artist in order to really make a viable business, but I knew that in the long run this wouldn't work, because when an artist becomes unsupported and unhappy, they cease to produce. Patrick O'Hearn left Private for similar reasons. In fact, I think he had a worse time than I did and was more hurt because he was

with them from the beginning.

"The music business has a way of operating: most of the attorneys are paid the big bucks by the labels, so all artists are represented by attorneys whose first allegiance really is to the label. So Joe said, 'Look, I'm not going to represent the labels — just my own — and I'll represent the artist without any conflicting interests.' He wrote an article that was published in a legal journal exposing this conflict, and we tried to make some waves. It's time for a shift and that's our commitment."

## INDEPENDENCE DAY

This is all well and good, but an obvious question at this point in the proceedings is whether Suzanne was at all worried about the gruelling prospect of Seventh Wave attempting to match Private Music's long established, powerful network of distribution through BMG.

"Well, my first two albums were self-produced, and I would have loved to have started a label even back then. I already had my businesswoman side, but I think New York City was just the wrong place to nurture New Age music, even though 'New Age' wasn't the term then. It was 'Classically-Inspired Instrumental Music.'

"We're lucky now because independent distribution has grown tremendously. Five years ago, if you wanted to be independent you had to make separate deals. Just for the United States you had to make five separate deals — the West Coast; the South; the mid-West; the East, or whatever. Everything was regional and it wasn't organised. Now we've had these conglomerate takeovers and mergers, so there are now internationally-viable independent distribution systems. They're not as large as the majors, but they're pretty damn close.

"We still have to get, for the most part, independent distribution for foreign territories and it makes more work, but, on the other hand, it's effective. BMG might have had my stuff for the whole world, but I've always had a big following in Spain, for example, and not so much in France, so what good did it do?"

Concerning the issue of territorial divides, I asked Suzanne why she felt her music has proved so popular in Spain, where she has completed two extensive tours in recent years. After all, surely there can be no language barrier with instrumental music?

"Well, I've noticed that the phenomenon of this so-called 'New Age' music — and I use the term very advisedly — does make inroads at different times in different places. There was a person named Ramon Trecet, who's a very powerful media person in Spain, who loved my music. Ramon had a TV show and put my videos on TV. I didn't even know about this until I was invited to come and do some concerts in Spain.

"I had no idea that I had such a following in Spain and of course you never find out from your record company because your foreign figures are always ridiculous. They don't pay you and that was another one of my real dissatisfactions — the fact that in a foreign country a CD might cost \$30



A new version of the title track of Suzanne's *The Velocity of Love* appears on *Pianissimo II*.

## NEW AGE, NEW MEDIA

Although originally released on Seventh Wave as a standard CD in 1994, *Dream Suite* was swiftly reissued the following year as a 'Multimedia Enhanced' version with an additional track of MacIntosh and MPC-compatible I-trax data.

The multimedia presentation begins with a static reproduction of the album sleeve artwork, the creation of Suzanne's sister and favourite artist, Mary. Suzanne also designed some of the backgrounds herself, getting involved in Adobe *Photoshop* which she found, "very similar to the thinking in audio synthesis." The CD features, amongst other things, short video clips of Suzanne and the Young Russian Orchestra in action at Mosfilm Studios in Moscow, and an interview with Suzanne at her "spiritual home" of Capri in Italy — where *Dream Suite* was mixed. Here users are encouraged by Suzanne to, "click on any of the icons to hear more about each song in *Dream Suite*." Excerpts from the chosen track

are then played.

A review in *US CD-ROM Today* magazine concludes, "Ciani deserves a lot of credit for making the most of the medium." There are, however, a couple of minor programming flaws in the production, unlike its more impressive *Pianissimo II* sibling, produced by the same team.

As Suzanne says, "I've been a tech-buff all my life, and even though I'm working in an acoustic domain now, my love for technology is still there. Many, many man hours go into this because we wanted it to be more than just a replica of the liner notes, which is kind of the in-fashion mode of doing these things."

A trip through the multimedia section of *Pianissimo II* is both entertaining and educational, as Suzanne introduces you to a brief history of the piano from occasional *SOS* contributor David Crombie's book, *The Piano*, shows you the actual music notation of her compositions in 'follow-the-bouncing-ball' fashion as the music plays, and takes you behind the scenes to the recording of the album.



retail and I was getting half of what I would get for an album in the United States! Explain that?

"The artist is an afterthought in the financial existence of a record. I used to cry because I did all these sold-out concerts in Spain, signing autographs for all these fans who would proudly come up thinking they were supporting you by buying your albums. I can say now that that is the case, but at that time they were supporting BMG, they weren't supporting me. So there was a lot of unhappiness there that made me want to adjust the experience. Now I go to Spain and I feel good."

### ELECTRIC BECOMES ECLECTIC

At this point, I steered our conversation onto Suzanne's new music by asking if she sees a continuation between *Dream Suite* and her past releases with Private Music, despite their reservations about its orchestral nature.

"I've got a long career, so my music is all related, but I think the idea for me to do an orchestral acoustic album was a surprise, because for years I had been heavily into electronic music and my ear was not satisfied by an acoustic sound. There was always something missing.

"On the other hand, electronics has changed quite a bit over the years and my ear longed for something with a little bit more refinement than I felt was achievable in the electronic medium. Even on the early albums with the analogue synths, I've always tried to find that level of depth, nuance, sophistication. Sometimes it's a lot of work to imbue that medium with all of those qualities. I guess it just became more and more work and therefore impossible.

"I wouldn't want to qualify electronics as a cheap medium. Basically, it's what you do with it that's important. But if the sound that you're talking about is orchestral, I don't care how hard you work at reproducing an orchestra electronically, you're gonna come up short. So if your goal is the orchestral domain, you're better off by far working with an orchestra.

"I considered at the time that I would add synths to *Dream Suite*, but in the end I was actually a bit overwhelmed by the beauty of the playing of the Russian musicians."

### FROM RUSSIA WITH LOVE

Suzanne then went on to explain how she came to record in Moscow with the Young Russian Orchestra: "I was starting to look for an orchestra and I'd heard that there was a lot of orchestras in the former communist countries that were now open. So I just started networking and making contacts. I found a guy in New York who said, 'Sure, I can get you an orchestra in Moscow. I can get you any one of 70 orchestras! What would you like?' And I said I wanted a youth orchestra.

"Everybody said if you're going to do an orchestral album then you should just go and use the London Symphony Orchestra like everybody else. But I thought I didn't want my music to be just like one more job to them, because the

emotional aspect is too important — not that they don't do a wonderful job, but my music is very personal. It depends on that emotional message and I just knew I would get that from these young, sensitive and highly-trained Russian musicians.

"The legacy of the communist countries musically is tremendous and now it's available to us, which is a privilege — to work with these people who have been supported all their lives since they were infants. Now they have no more state support. This wonderful resource is going to disappear and, in fact, is already disappearing. A lot of those musicians have migrated to the United States and any other orchestras where they can actually make a living, so I felt that for me to be able to take advantage of that moment was really a privilege."

On the downside, the fall of communism has also had a detrimental effect on the everyday lives of Moscow's general public, with an appalling rise in drug trafficking and inner city violence, for example. Were there any hairy moments during the *Dream Suite* recording sessions at the Mosfilm studio complex?

"I had such fears about going to Russia. I brought my own recording tape and almost — and should have — brought my own toilet paper! I didn't know what to expect, but I got to Moscow and the studio is the most incredible studio that one could ever want. Russia's filled with wood and this enormous studio is covered with beautiful resonant



Suzanne playing her Kurzweil keyboard: "I'm a Kurzweil convert."

wood throughout. It was the most incredible studio I've ever worked in, in that medium."

I assumed the recording equipment at Mosfilm to be of Western origin: "Well, they did say that they had a digital recorder and when I got there it turns out they didn't! It was just there on loan from a Japanese person who'd brought one in one day. In a way that was better, because I recorded on analogue and I'm really happy because I might not have made that choice if they'd had the digital machine. Analogue really does make a difference — the warmth is wonderful.

### SEVENTH WAVE ON THE 'NET

"I think it's very, very important [to have an Internet presence]. We like to deal on an international level and it collapses the universe. I get email from all over the planet every day. I'll have friends telling me what's going in Chile, say, and whether the record stores have my albums. Fans are very supportive. They're very up-front and we appreciate their help. Now that I'm running an independent label, it's a whole different ball game and it does mean something and make a difference to me, my art and my life — not just to BMG!

"Joe [Anderson] masterminded our Web Page and we put some samples of music in there. Now that we have a label with new releases all the time we have to update it pretty frequently — maybe on a monthly basis."



# Suzanne Ciani

► "When I got to Capri Digital [Studios in Capri, Italy] I went over to 48-track digital for the ease of editing and I added my piano and whatever else I needed to do. As producer, that was necessary because I really needed to be in the booth as these things move fast and furiously. I brought my little PowerBook computer to Moscow and I had all the pieces in the PowerBook, so the conductor actually conducted to a click that I designed. So all the tempi were kind of set and that allowed me to add synth later, if I wanted to."

## I SECOND THAT EMOTION

Coming full circle, we arrived at *Pianissimo II*. Suzanne: "Because I'm living here, my involvement



Suzanne's Californian home studio.

with the piano is conditioned by this lifestyle. I'm far away from the music industry and I pretty much live with my piano. My first piano album, *Pianissimo*, was one of my biggest-selling albums. I didn't understand why, because here I was devoting my life to furthering the art of electronics, then I toss off an acoustic piano album and everybody goes, 'Yes! Yes!'

"And I have to say that influenced me, because people hear differently and, in fact, hearing is an educated response. I can't expect my audience to hear electronic music the same way as I do — they're not interested in that level. There's a gap between what excites me and what excites them. The way I might say, 'Wow, listen to that vocoder patch!' simply isn't in their world.

"Parenthetically, a long time ago I studied Indian music. I remember before I studied it I'd put on an Indian record and it would all sound the same to me. After studying, I was able to make all the distinctions. It was a big lesson to me because I realised that there is no absolute about the way people hear. Who knows what people are hearing? But I do think that the emotional message should communicate, regardless of anything else. I get excited about 24-bit and all of that, but I know that the real goal is to make an emotional communication.

"Getting back to the *Pianissimo* concept, the piano is such a different emotional medium. It's so intimate. Doing a piece one way and then hearing it kind of naked on the piano is just a wonderful thing. Some people might say, 'Are you giving us new pieces or are you just redoing all those old ones?' But for me it's another expression completely. You're totally involved in the performance, and it was emotionally quite draining for me because it was such an intense focus."

## KURZWEIL KONVERT

Evidently this lengthy ongoing project will involve Suzanne reverting back to her compact and bijou collection of electronic instruments, with the 88-note Kurzweil K2500 taking centre stage as the master keyboard controller: "I used to have these very strong opinions about different manufacturers and I always said I'd never use a Kurzweil. I just didn't like the sound. Then when I moved into this house, before I had my equipment sent from New York, Joe loaned me his Kurzweil, and it won me over. I started investigating, got involved and started talking with the Kurzweil people. I found them to be a very dedicated and excellent company. I like the way they do business and where they're coming from. They really do care, and the K2500 and K2000 are both sophisticated instruments with a lot of depth. So I'm a Kurzweil convert!

"I'm very fond of these 'orchestras-in-a-box' like the Proteus 2 — on which I wrote *Dream Suite* — and I'm trying out Roland's new MCC10 Orchestral module at the moment. I get a big kick out of opening up something and taking out an instrument that weighs only 10 ounces! I want something which I can carry over my shoulder, so I've just got a tiny little portable Korg, because one of my needs is to be able to write whilst on the road. I like Korg machines too. I like the company and what they do.

"One of my main tools is still the Disklavier MIDI piano. I just sketch into that all the time. It makes me confident that a fleeting idea won't disappear. I like using all the tools. It makes life much easier. I'll sketch something in the Disklavier, then I'll listen to it; play it on the Kurzweil into the computer; print it out; play with it some more; write in changes and corrections; play it in again; take it apart; reorganise the architecture of the piece by saying, 'This verse should be here,' or whatever."

Clearly Suzanne's not about to hang up her MIDI leads just yet!

SOS



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# THE BEST OF A.M.G.



**BLACK II BLACK KILLER VOCALS 2**  
AVAILABLE NOW! Another 2-CD package of vocals from McIntosh & Charles to follow-up the hugely popular Killer Vocals Volume 1 - this time a massive collection of almost

2000 vocal samples. CD 1 (1287 samples) features hooks in a similar vein to volume 1. CD2 (which is again completely license-free) runs for almost an hour, includes 689 samples and features 'Aaah' notes and chords this time, and is accompanied by a selection of license-free hooks too. **SO DON'T MISS PART TWO OF THE BIGGEST AND BEST VOCAL COLLECTION EVER RELEASED!** Audio CD: £59.95



**SOUN' BWOY**  
"SOUN' BWOY - KRITICAL MASSIVE" is a brand new dance sample CD featuring grungy, dirty Regga and Dub samples. It features loops, Vocals, Bass, FX and loads more.

If you're looking for dirty dub sound and rhythm, with tons of feel to sit under your next music project, you should check this out this resource of fresh new material. Release date of this CD is set for Dec '96 / Jan '97 - call for latest information. "Soun' Bwoy" will be featured in our jukebox listening stations at over 50 UK dealers from 1 March onwards, if not before! Audio CD: £59.95



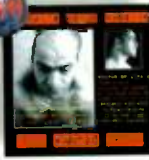
**SMOKIN'**  
by Tony Mason  
Seventy-three minutes of specially recorded grooves with a strong dance flavour. All samples have undergone analogue processing to give an authentic 'rare' valve sound. Smokin' was recorded in Trinidad and the UK by much sought after session drummer, Tony Mason (Tony has taken care of drums for Al Green, Incognito, Fine Young Cannibals and George Michael).

The ideal drum loop CD for anyone looking for great sounding beats with attitude. **STRONG DANCE FLAVOUR WITH A LAID BACK RHYTHM AND BLUES ATTITUDE.** Audio CD: £59.95



**RHYTHM OF LIFE 1**  
Immaculate performances and flawless production! The producers' artist credits include: Tina Turner, Dire Straights, Wham!, George Michael, ABC. Features 49 tracks of creative grooves, with many different mixes, some featuring

RSS processing. Also a comprehensive selection of single hits in many styles plus more classic solo grooves. **REVIEWS:** 'Immaculately played and recorded in stereo... inspirational to work with... A connoisseur's product' (Sound on Sound magazine, UK). 'Production is superb' (Future music, UK). Audio CD: Only £29.95 Roland CD-ROM: £149.00



**PASCAL'S BONGO MASSIVE**  
Rhythm of Life Vol. 4 is a 2-CD set from Pascal Benadjouid, the top percussionist whose credits include Stereo MCs, Bob Marley, Lisa B, Gypsy Kings etc. Also well known on

the UK club scene, he's worked with top UK DJs like Paul Oakenfold & Danny Rampling, often adding live percussion to their mixes. Features longish grooves with various mixes accompanied by solo patterns and hits. Lots of tight, inspirational performances to explore. All in all this is another high quality and useful collection from AMG that's sure to become another classic. Audio CD: £59.95



**GOTA YASHIKI - GROOVE ACTIVATOR**  
Gota Yashiki (known as 'The Funky Monk') has programmed and laid down the beat for Simply Red, Soul II Soul, Bomb the Bass, to name a few.

'Groove Activator' features specially recorded drum grooves from 70 bpm - 123 bpm plus single hits of kicks, snares, fills, toms, hats, cymbals and percussion. Gota's ability to make machines groove is legendary. "5 STARS" (Keyboard USA). "This CD enables you to grab beats, hits and variations for that funky live sound... The fluid style and funkiness is enough to add a groove to the tightest of sequences. Yashiki's style is a matter of taste, but his loops are your 'bag' then this is essential material." (Future Music, UK). Audio CD: £59.95 Akai CD-ROM: £149.00



**VINCE CLARKE**  
"Lucky Bastard" by Vince Clarke. Synthesist/Composer and Founder member of Depeche Mode, Yazoo, The Assembly, and Erasure. "A must for anyone creating techno-pop tunes. Ambient-dance acts will love the filtered sections, rave and acid fans will love the blippy loops. Industrial bands will want the heavy kicks and sub-basses. Kraftwerk electro-artists will use the thips, pings and electronic percussion noises. New age nuts will layer the sweeps with their guitars...one hell of a useful CD. 9/10" (Future Music, UK). A huge collection of sequences specially created by Vince using his massive collection of classic analogue synths. Many synth-generated drum loops. Multisamples, plus all the samples from Erasure's last 'Chorus' tour. Audio CD: £59.95

fans will love the blippy loops. Industrial bands will want the heavy kicks and sub-basses. Kraftwerk electro-artists will use the thips, pings and electronic percussion noises. New age nuts will layer the sweeps with their guitars...one hell of a useful CD. 9/10" (Future Music, UK). A huge collection of sequences specially created by Vince using his massive collection of classic analogue synths. Many synth-generated drum loops. Multisamples, plus all the samples from Erasure's last 'Chorus' tour. Audio CD: £59.95



**NORMAN COOK**  
This is a massive collection of superb loops, ranging from 84 BPM to obscenely fast. Plus a very comprehensive collection of vocal samples, FX, Bases, Drum & Percussion hits, Guitar, Reggae, Flute, Sax, Brass, Synth, and many more. The more you

use it the more you like it. **REVIEWS:** "Another AMG masterpiece... some of the best cases of a white boy utilising a reggae feel since the days of The Clash" (Mixmag, UK). "A good option if you can only afford to buy one disc." (Melody Maker, UK). Audio CD: £59.95



**HOT & SWEATY HOUSE CUTS**  
This new dance sample CD produced by top US DJ Papa Large is in the Megabass 'REMIX!' mould but with a strong emphasis on house and a very commercial edge. Papa Large has been on the

underground club scene for more than a decade and built up a huge sample library that he's now made available for the first time. His CD features hard, bangin' drum and percussion loops, rolls, synth FX and sequences, guitar, organs, vocal hooks, stabs, hits, FX, and more, and runs for 73 minutes. Miss it at your peril! Audio CD: £59.95



**TIM FARRISS - "DEEP INSIDE"**  
New, from world famous INXS guitarist Tim Farriss comes an awesome collection of guitar samples, drum loops, dialogue, FX, Hitz and more.

This sample collection has taken over four years to compile and provides you with many of the most treasured samples from Tim's personal collection. Brilliantly produced, this CD is packed with goodies for all sorts of compositions. Audio CD: £59.95



**FREEKIE JACK SWING**  
from Blackbeat features New Jack Swing, Rap and Regga. **REVIEW:** "The recording quality is superb... head and shoulders above the standard of most loops currently available on CD... the one thing that truly stands out

about this CD is the sheer quality and musicianship of the programming... a CD of remarkable subtlety, which will undoubtedly be a big hit with anyone needing a fresh and exciting approach to swingbeat groove construction... an inspired collection of fantastically original sounding and powerful swingbeat, rap and regga grooves and loops". (Sound on Sound magazine, UK, July 1995). Audio CD: £59.95



**GLOBAL TRANCE MISSION**  
A pair of specially created dance sample CDs with the emphasis firmly on analogue synthesis. Includes: Synth sequences, Ambient Pads, specially processed drumloops, Synths & synth FX, Atmospheric sounds,

Basses, Sung vocals & dialogue, FX, and amazing ethnic sounds resulting in a unique and highly creative sample library. **SPECIALLY CREATED BY GARRY HUGHES AND NICK FISHER - IDEAL FOR TRANCE, AMBIENT & RAVE. THESE ARE ARE INSPIRATIONAL CUTTING EDGE ORGANIC SOUNDS.** • CD 1 Audio: £49.95 • CD 2 Audio: £49.95 • Both: £79.95



**KICKIN LUNATIC BEATS VOLUME 2**  
By Keith LeBlanc. A major departure from his original CD. Largely recorded and mixed at Adrian Sherwood's On-U Sound Studios. A huge selection of extreme drum

beats (many presented with a selection of alternative dubs) radically different from those on any other sample CD. Also a selection of beats that Keith has collected over the years, a very weird FX section, and some specially recorded hits. This is an awesome drum CD, perhaps closer to Gota Yashiki in style than any of AMG's other releases. A unique sample collection that could only be Keith LeBlanc. Audio CD: £59.95. [CD-ROM coming soon].



**BLACKBEAT 96th St**  
This is D.D. Hunte's sequel to his successful 'Freekee Jack Swing' CD. This CD follows a similar format, but concentrates on the split loops and adds a large selection of individual sounds on top of these.

The loops are divided into three styles - Rap Street Loops, Future Funk Street Loops, and Caribbean Street Loops. Each loop features four alternate versions, a standard drum loop, one with bass, another with vocal fx, and lastly with everything together. This sequel will not disappoint. Audio CD: £59.95



**REMIX! Vols 1 & 2**  
REMIX! is the sequel to the highly successful best-seller 'Megabass Remix 1' from UK's 'Megabass' team (Martin Smith & Darren Ash) - this one features more incredible rave loops (fast BPMs), scratch

toolkits, Choral Vocals (sung and chanted), Special effects, Ambient, Acid, Synth, Bass, Drums, and much much more. Remix 1 has been a best-selling CD for rave loops - this release fills in all the areas that were lacking in volume 1 and adds additional styles. **REMIX! VOLUME 1: £59.95 (audio CD) REMIX! II: £59.95 (audio CD)**



**FUNKY DRUMS FROM HELL**  
By UK drummer Neil Conti - over 90 long developing grooves offering literally thousands of juicy potential loops. Features five distinct sounds - Mellow Antique, Hard Funk, Dry Studio, The Basement Tapes,

Natural Room. Recorded at top London studio, Metropolis, by Daniel Lazarus. Also includes Funky Hi-hats and Solo Hi-hat patterns, and a section of extracted single hits. The playing is immaculate... a controlled looseness in the playing... the snare drum sounds like a snare drum should. Audio CD: £59.95 Roland CD-ROM: £149.00



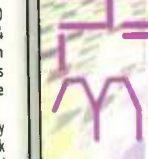
**ABRACATBLA**  
By Talvin Singh, a leading exponent of ethnic fusion (works with top acts like Massive Attack, Bomb The Bass). Huge selection of mostly ethnic percussion. Highly contemporary ensemble grooves with

extremely intricate, tight performances, broken into various mixes/combinations/sounds. Also solo patterns complete with very comprehensive sets of single hits. "They don't come much more talented than Talvin Singh... these loops could add extra sparkle, spice and class to any music... Took three years to complete... this is one inspirational CD" (Future Music, UK). Audio CD: £59.95



**LOOP SOUP**  
Loop Soup is a double CD package featuring highlights from 4 classic AMG sample CDs: Norman Cook's Skip To My Loops, Megabass Remix 1, Pascal Gabriel Dance Samples and Coldcut Kleptomania. Plus you also get a taste of many other AMG artists like Black II Black

(already a classic), Keith Le Blanc, Gota Yashiki, Blackbeat, David Ruffy, Neil Conti and D-Fex. A 'must have' if you have not already turned on to these killer CDs. The styles vary from live drum loops (Neil Conti, David Ruffy) to full-on rave loops from the likes of Martin Smith (Megabass) and the Coldcut team. An incredible collection at an amazing price! Audio CD: £59.95 Akai or Roland CD-ROM: £149.00



**KARMA CHOPRA**  
The Ethnic Dance Sample CD by Sumeet Chopra. **FEATURES:** • Fusion Loops (ethnic grooves fused with western drumloops), • Ethnic build-ups (grooves plus their component parts) • Tabla grooves • Ethnic grooves, licks

& hits, and more. Includes percussion plus string & wind instruments. If dance is your bag, you should definitely check this ethnic CD out before making your choice. KARMA CHOPRA brings you a diverse set of sounds that will help you experiment, fusing the East with the West to create your own musical cocktail. Audio CD: £59.95



**BLACK II BLACK VOLUMES 1 & 2**  
By Steve McIntosh & Joe Charles. One of the biggest & best sets of kickin' R+B samples around. All the loops, Vocals, Brass lines, & Drum hits were specially recorded. Features: Reggae,

Regga, Swing, Jazz house, Euro house, Mad house, Slo jamz, Rap, Guitar licks, Bass lines, Garage, and Disco. "Monstrously funky, soulful rhythm loops... highly recommended for teachers of contemporary arranging" (Keyboard, USA). "Swingin' funky loops... a very good example of how to construct a sample CD... useful, well recorded and organised." (Future music, UK). 2 Audio CDs: £59.95 each, or 2 Akai CD-ROMs: £149 each



**BLACKBEAT**  
The loops are divided into three styles - Rap Street Loops, Future Funk Street Loops, and Caribbean Street Loops. Each loop features four alternate versions, a standard drum loop, one with bass, another with vocal fx, and lastly with everything together. This sequel will not disappoint. Audio CD: £59.95

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*The Deltafex offers a stripped-down price to match its streamlined facilities. DAVID MELLOR checks it out..*

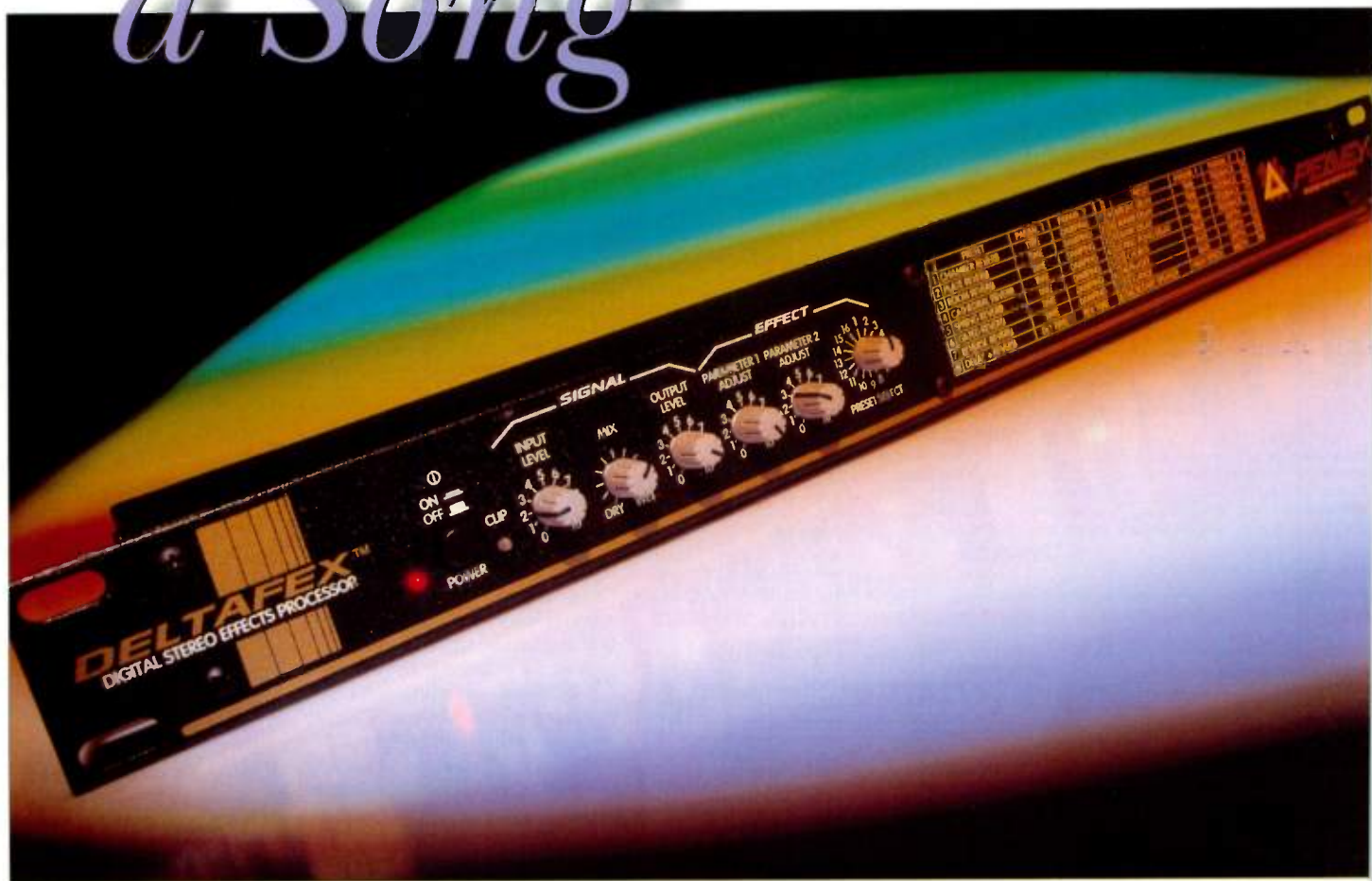
Peavey's Deltafex is unashamedly an entry-level, non-MIDI multi-effects unit, which sets out to combine low cost (its retail price is just £155) with simplicity of operation. Its main function is to provide reverberation, though it also caters for basic delay and modulated delay effects such as chorus, phasing, flanging and rotary speaker. The format is the familiar 1U rack, and the equally familiar external power supply also puts in an appearance.

## LAYOUT

The Deltafex has two inputs and two outputs which work in the conventional manner, where the input signals pass straight through under the control of the wet/dry mix knob and retain their stereo image. In addition, the two signals are summed and sent to the effects processor, which creates pseudo-stereo effects. The stereo inputs only need to be used when you're putting the unit directly after a stereo source, such as a stereo keyboard; when you're working with a mixing console, you need only use one post-fade aux send. If you only connect the left input, it will automatically be linked to the right channel.

The only other connector, apart from the power connector, is a footswitch jack which, in conjunction with an optional footswitch, may be used to mute the reverb input, or change speed in the case of the rotary speaker effect. This is

# Going for a Song



## PEAVEY DELTAFEX DIGITAL STEREO EFFECTS PROCESSOR

The most obvious feature of this unit is its operational simplicity, though, unlike earlier 'preset only' devices, the Deltafex allows you to change up to two key parameters per effect in real time. There's no liquid crystal display, and no buttons other than the power switch, and while this simplicity might seem limiting, at least you know you're going to be able to use the Deltafex to its full capacity straight out of the box.

especially useful on stage.

On the front panel are six knobs and a printed table of effects. Although in the studio you would control the input to the unit from the mixing console, leaving the dry/effect mix control set to 100% effect, there are situations (such as when using the unit in-line with a stereo keyboard), where you might want to control these parameters from the Deltafex itself. Accordingly, ►



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E & OE



# Peavey Deltafex

- ▶ input level, output level and wet/dry controls are amongst those provided.

It is vitally important to be able to set the correct input level on a reverb unit, in order to steer an optimum course between overload distortion and circuit noise, and to do this, you need effective metering. I can understand that a bargraph meter might be too expensive an addition for a unit in the Deltafex price bracket, but surely a three-colour LED would have been a cost-effective option? What's actually provided is a two-colour LED that remains unlit when the signal is low in level, shows green when the level is acceptable, and lights up red when the signal is within 6dB of clipping. I prefer the system where green indicates signal present, yellow indicates a healthy signal level, and red shows impending clipping.

## EFFECTS

The effects are called up using the Preset Select control, which is similar to the rotary switch found on a number of Alesis reverb products. As is usually the case with this type of switch, you can't always be sure which setting you've selected, especially if you're not looking square on to the control. Considering that you have to set this control to an accuracy of 22.5 degrees to get the preset you want, a larger knob would have been justified, even though the white legend is clear enough.

The Deltafex has 16 presets, comprising plain

only names the presets but also indicates which two parameters are controlled by the Parameter 1 and Parameter 2 knobs.

Since the five basic reverb presets are arguably the most important (and probably would be the most often used) effects produced by the Deltafex, I'll look at them in a little detail:

- **Preset 1: Chamber Reverb.** This sounds like a smallish concert hall, possibly the size of a school hall, with hard walls, at least two of them parallel (the reason I say this is that I can hear a bit of a flutter echo — not much, but it's there), and with a moderate amount of architectural detail and HF absorption, as might occur in real life from introducing movable drapes. Although the reverb time is variable between 150ms and five seconds, the decay time is also affected by changing the amount of damping. There's always a certain amount of high-frequency reflection evident, even at the shortest reverberation time, while the damping parameter seems to control the hardness of the surface, from marble to candy floss.
- **Preset 2: Plate Reverb.** A plate reverb should generate a rapid build-up in reflection density, with a bright, characteristic tonality. This preset is quite dense at high frequencies, with distinct reflections from the edges of the plate, and is particularly good, at shorter reverberation times, for adding a little 'air' around an instrument or voice without the reverb being noticeable.
- **Preset 3: Room Reverb.** This doesn't sound a



reverbs (with one gated reverb), one reverse reverb, and a selection of other effects. Two knobs (labelled Parameter 1 and Parameter 2) then provide instant access to two parameters for each effect, though the parameter being changed depends on the preset you've called up. In the case of the reverbs, for example, you can control reverberation time and HF (high-frequency) damping. Reverberation time is simply the time it takes for the reverb to die away (by 60dB, in theory), and damping would normally control the high-frequency reverberation time. In a real room or auditorium, low-frequency reverberation is very difficult to control, while high frequencies are easily absorbed by carpets, soft furnishings and wall coverings. This means that most real rooms have a longer reverberation time at low frequencies than at high frequencies, and it is this characteristic that the Deltafex seeks to give you control over. The front-panel table of effects not

million miles away from Preset 2, except that the balance of frequencies is shifted upwards. I think I might have called it a small plate.

- **Preset 4: Cathedral Reverb.** This preset offers ultra-long decays, up to eight seconds, that are ideal to complement your selection of Gregorian Chant samples.
- **Preset 5: Spring Reverb,** doesn't quite reproduce the twang of a spring to the extent that it occurs in real life — and it doesn't 'sproing' when you kick it! At certain settings, Preset 5 seems to sound identical to Preset 3, and to be honest, there's an underlying similarity between most of the presets.

The two parameter controls are where the Deltafex scores, however, since if you find that the overall sound of a preset is to your liking, you can fine-tune it to your desired reverb time and high-frequency damping very easily. It's much easier to do this with knobs than on a parameter-access, programmable unit. However, I found that

## pros & cons

### PEAVEY DELTAFEX £155

#### pros

- Knob interface.
- Two parameter adjust controls.
- Good basic reverb quality.
- Excellent delays.

#### cons

- Yet another anonymous external power supply to get mixed up with the rest.

#### summary

An excellent first or supplementary reverb unit, with a valuable selection of other effects.

**SOUND ON SOUND**



the review unit took a second or two to settle down after changing parameter settings, which could lead to some unusual effects during the settling period. This was particularly noticeable on the gated reverb preset.

Any of the Deltafex's basic reverb programs are good for vocals, even the cathedral reverb, since you can adjust the parameter controls to get a short, dense reverb that enhances the voice rather than obscuring it, as is sometimes the case with

“Even if you're stacked up to the ceiling with reverbs, the Deltafex is still worth buying as a dedicated delay box.”

other reverb units. The DeltaFex also sounds good on drums, though you can feel that you're hearing an artificial sound — it's not as realistic an imitation of a real drum room as some other (usually more expensive) units achieve.

I'll just mention the other presets briefly, starting with Preset 6, Gated Reverb, which is, as you would expect, great where you want a lot of density close to the original sound, without a long reverb tail to clutter up your mix. Reverse Reverb (Preset 7) is really a bunch of reflections with a slow build-up followed by an abrupt shut off, and works fine as a special effect. The delay presets (8-11) are unexpected gems. Delay isn't used as much as it used to be, probably because it's tricky to set up on most digital effects units, and there are usually other, more seductive presets just a button-push away. The Deltafex offers Bright, Warm and Dark delay presets, where the delay time and number of repeats is set with the two parameter knobs. The difference between the presets is in the rate of roll-off of high frequencies.

As well as simple one-off effects, there's a nod in the direction of multi-effects in the Reverb+Delay preset, and also a nice ping-pong Stereo Delay. The remaining effects are Chorus, Phaser, Flange and Rotary Speaker, all of which are designed to sound best when used without mixing in the original signal. Although they are all perfectly usable, the best for me is the Phaser preset, which reminds me of the old analogue effects pedals of the '70s.

## VERDICT

In conclusion, the very accessibility of the Deltafex would make it a good first reverb and effects unit, particularly as it encourages you to create your own sounds rather than simply skip through manufacturers' presets. As a second reverb in a more sophisticated setup, it would easily justify its place in the rack, though I'd say that its greatest strength is, perhaps surprisingly, its delay presets, since there are so few delay units available that you can adjust with knobs. Even if you're stacked up to the ceiling with reverbs, the Deltafex is still worth buying as a dedicated delay box. At the price, you could hardly go wrong.

SOS

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Similar in construction to the ISOPATCH, the ISOPATCH BANTAM is fitted with 96 'Bantam' type (4.4mm) Jacks. Rear connectors are via 6 integral 37 pole 'D' type rear connectors which eliminates the need for internal wiring. Top PCB gives access to commoning points and 'program pads' for normalising. Direct solder connections can also be made if a lacing bar is used.

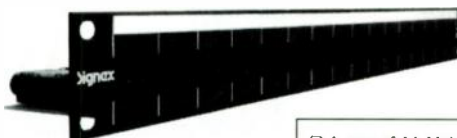
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# C'mon, heal the Noise

*Software-based noise removal systems are one way of restoring defective recordings, such as vocal takes wrecked by mains hum, or crackly recordings from vinyl — but such systems can be very expensive. The relatively low-cost DART Pro seeks to change all that.*

**PANICOS GEORGHIADES and GABRIEL JACOBS clean up all round.**

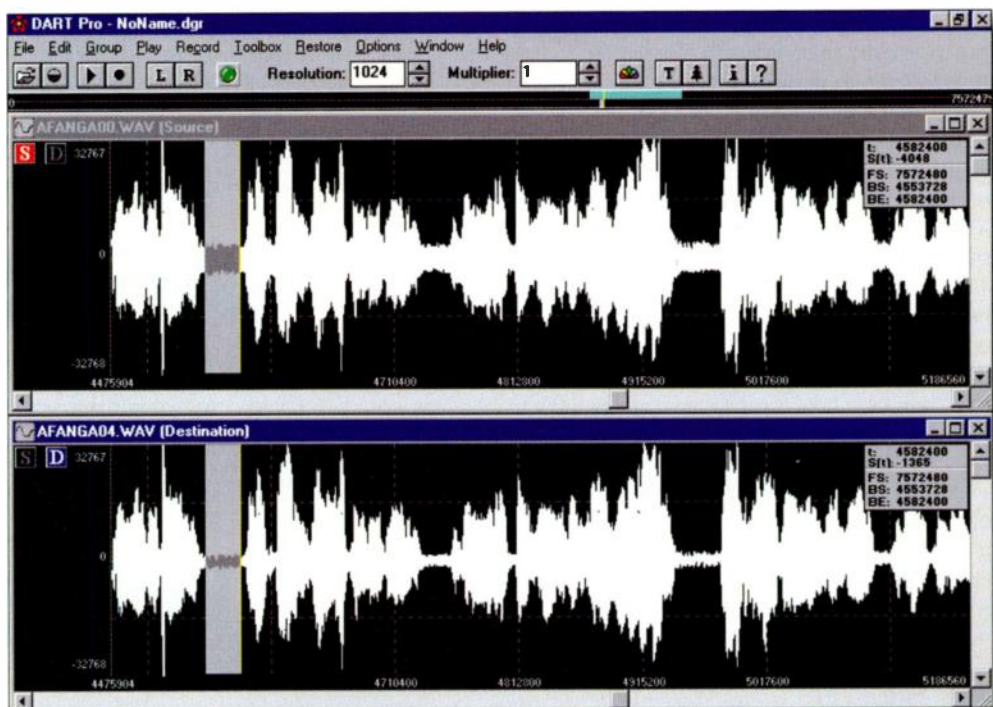
TRACER TECHNOLOGIES  
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of CD writers having come down to about £500, putting the cleaned-up material onto CD is not out of the question either.

## IN SPACE, NO ONE CAN HEAR YOUR POOR SIGNAL-TO-NOISE RATIO

Sound restoration, and especially digital sound restoration, has so far been a very expensive business — it's one almost as tough (and therefore costly) as searching for alien messages from outer space. This comparison is not as irrelevant as you might think; when radio telescopes listen in to electromagnetic waves from space, the signals are put into giant computers and analysed in order to extract the existence of any meaningful information from random noise. Digital audio restoration works on exactly the same principle: here too, the computer has to analyse the sound waveform and subtract the noise from the meaningful sound.

This is a pretty tall order. In fact, there aren't that many systems in the world that can make a really good job of it. And the problem with



*This is a file before and after DeNoise restoration. Notice the thinner 'necks' in the restored waveform, indicating the reduced noise level.*

The proliferation of 'clean' digital sound, as employed by CDs, NICAM stereo, DAT and hard disk recording systems used in studios, has gradually made many people intolerant of imperfect sound. Just as most people don't like to watch black and white films on a colour TV, so they tend not to want to listen to scratchy or hissy recordings.

This tendency is even more prevalent in those who make and record their own music. In the quest for perfect sound, many of us pay just as much attention to sonic quality and the cleanliness of our recordings as we do to the music itself. If you're among such sonic perfectionists, you may find it hard to listen to many of your noisier recordings, with all their flaws. Now, if you have a PC, a soundcard, and lots of hard disk space, it's possible to clean up your sound library — or restore it, to use the jargon — and with the price

systems that aren't good is that they can subtract meaningful sound content as well as noise, and make the resulting sound rather dull.

Among the best noise removal systems we know of is CEDAR, developed in Cambridge. Tracer Technologies' *DART Pro* (Digital Audio Restoration Technology) Windows PC software, under review here, doesn't match up to CEDAR, but it is pretty sophisticated. It's capable of removing both impulsive disturbances (clicks, pops and scratches) and wide-band noise (tape hiss and surface noise). And although it's not a real-time tool, the process doesn't take forever. Equally importantly, its price would get you only about 10 minutes of restored sound if you used CEDAR's bureau service!

**pros & cons**

**DART PRO £299**

**pros**

- Cheap for what it offers.
- Relatively fast, with fine control over every step of the restoration process.
- Easy to use.

**cons**

- Don't expect miracles.
- Needs experimentation.
- Can create dull sound if you are not careful.

**summary**

Digital sound restoration isn't easy, and this program does very well for its price. The results depend on personal taste, but on most of our experiments it performed well.

**SOUND ON SOUND**



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## ► USER INTERFACE AND MENU COMMANDS

*DART Pro* has an easy-to-use graphical interface, and a window synchronisation feature and various zoom options enable you to get around easily. We're also happy to report that the program includes useful on-line help, keyboard shortcuts, and [*hooray — Ed*] a good manual.

Apart from restoration, *DART Pro* can be used to a certain extent as a sound editor, as it also allows you to record, edit and process sound files in a number of ways. The Record menu opens a separate window which allows you to record WAV files directly from within *DART Pro*, without the need for an external recording application. The sample rate and bit resolution of the resulting file can be set in this window. The Edit menu provides standard editing tools such as Cut, Copy and Paste, as well as others for marking points in a sound file and selecting local areas (Select Modified Area, Select Local Block). In addition to the standard Open, Save, and Delete options, the File menu also has a sound file format conversion option (RAW to WAV, WAV to RAW; no other formats are supported). The Play menu options are simpler, allowing you to play the entire sound file (Play All) or just a portion of it.

The Toolbox menu contains fairly general processing functions, such as Scale and Maximize, and those for muting, reversing, and fading a signal (in or out), as well as those for comparing and mixing two signals. The Compare option in the Toolbox menu is particularly useful — it subtracts one waveform from another, and presents you with the result. If, after restoring a file, you subtract the restored waveform from the source file, the resulting file should, at best, simply contain noise, clicks and crackles. This helps you hear how successful your restoration session really is. The Split and Unite options, also found in the Toolbox, can be used to separate two channels of a stereo sound file, and to combine two mono tracks into a stereo sound file.

The Toolbox also contains other more complex processing functions, such as filtering (low-pass, high-pass, band-pass and notch types are available) and equalisation. The Equalise function brings up a 10-band graphic equaliser, while the Notch filter enables you, for example, to remove unwanted hums produced by mains current.

## RESTORATION OPTIONS

The Restore menu is where the most important functions in *DART Pro* are found. Digital sound restoration is a subjective process, and, as with using a tone control to reduce hiss, it's up to you to decide where to draw the line (though the program has default settings which are worth trying first). Depending on your needs, the system can attempt to restore an entire WAV file (using the Run All option) or just selected parts of it (using Run Window, or Run Block). The EasyRun option uses the default options and gives you a start, but it's worth selecting some settings yourself for the best results. Luckily, there are only three settings to try: the smoothing factor, the post-filtering factor, and the detection threshold. You also have to specify whether the sound has any vocals in it. See the 'If Noise Annoys' panel for more details about these processes. In some cases, the quality of a restored recording can be further improved by means of local 're-touching' — just hit 'Process' again. If you overdo it, you can undo at every stage of the processing, even to the extent of undoing single changes to your source file. So if you're broadly happy with the results of the processing, but find that the program has dulled the first word of a vocal too much for your liking, you can undo just that change, and keep the rest of the processed file the same.

The DeNoise function, also found under the Restore menu, is a recent addition: it's a procedure for eliminating wide-band noise with certain known characteristics. Prior to using this function you have to 'noiseprint' an audio file, which involves running the NoisePrint noise identification function on a fragment of the recording that contains noise only — for example, a short piece of crackly silence at the start of a recording. Alternatively, if no reference noise sample is available, you can try using a noiseprint extracted from another archive recording (preferably from the same source — for example, from somewhere else on the same old record).

Finally, DeHiss, another new feature, is a wide-band noise reduction utility based on a standard noise model. You can use it when a noiseprint is not available at all. If the file's noise characteristics vary over time, the DeHiss function may yield better results than DeNoise — because it is less selective, it is also less sensitive to changes in the noise profile.

## IN USE

We tested the program on half a dozen sound files, including one that featured a 1970s studio recording of some piano music that we had also restored using the CEDAR system. Although *DART Pro* was not as effective in removing hiss as CEDAR, it did

## SYSTEM REQUIREMENTS

*DART Pro's* minimum system requirements are Windows 3.1 or later, 8Mb of RAM, and a large hard disk. A maths co-processor is also recommended for work on large audio files.

## IF NOISE ANNOYS — HOW DART PRO WORKS

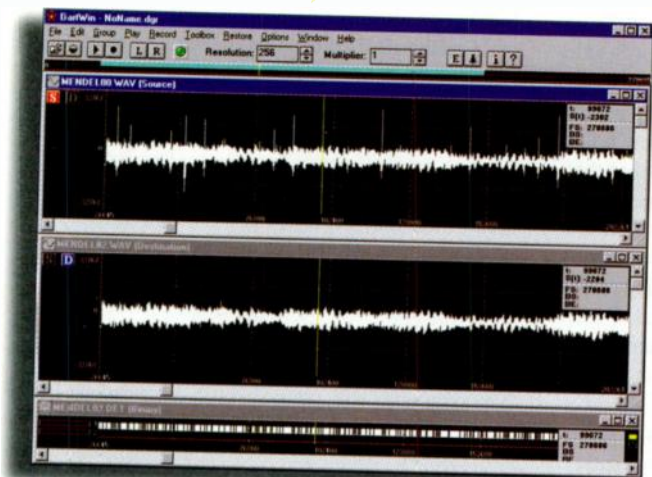
The heart of the *DART Pro* system is its adaptive renovation filter, which is a rather clever algorithm designed to isolate and reconstruct samples corrupted with clicks, pops, record scratches and other forms of impulsive noise, as well as removing wide-band noise (like tape hiss). The process consists of two stages. First, impulsive noise is removed, together with some wide-band noise. This process is known as smoothing, and is achieved with a special device known as a Kalman filter, which is used to reconstruct the signal. Secondly, a special adaptive post-filtering algorithm is used to further reduce the noise. This algorithm is designed for adaptive cancelling of wide-band noise, and is therefore particularly effective on tape hiss and surface noise. Smoothing is generally uniform, while post-filtering is selective: in other words, smoothing acts in the same way on all parts of the recording, while post-filtering suppresses most noise on silent parts and least noise on loud parts, where the noise is, of

course, less audible. In this way, the sharpness in the louder parts of the original recording isn't lost.

The third user-definable setting is the detection threshold. This decides the sensitivity of the so-called outlier detector, a device used to localise impulsive disturbances. With the smoothing and post-filtering settings at zero, *DART Pro* will de-click and de-crackle the recording without attempting to remove the wide-band noise.

The algorithms used by *DART Pro* are pretty impressive, but they work much better on music than on speech (which is why the program asks you to specify whether your sound file has vocals in it). Speech is much harder to restore than music. Devoiced consonants ('K', 'S', 'T' and so forth) pose a problem, because it's hard for an algorithm to distinguish between them and, say, a crackle. Vowels pose an even bigger problem, because they have a pitch and are often very short, and pitch-related pulses can be easily confused with noise pulses caused by clicks or record scratches.





Main screen showing the original and restored wave file. You can see the clicks (which show up on the original file as spikes) and how they have been removed in the restored file.

comparatively well, not adversely affecting the sound or making it dull. We also had the opportunity to try the program with an original 78rpm disc recorded in 1952, which was badly scratched, as well as with recordings made on cassettes in the late '60s on domestic equipment. *DART Pro* does not remove the noise or clicks completely; it lowers their sound level, so that the real signal can come through (it is possible to remove noise completely, but some deterioration of the signal does occur). Some experimentation with the restoration parameters is also necessary, but it is certainly worth the time.

Processing time, on our 486/66MHz machine, proceeded at a ratio of about 10:1 for clicks and scratches, and about 5:1 for noise reduction — in other words, it takes 10 minutes to remove the clicks and scratches from a one-minute, 44.1kHz, 16-bit stereo recording, and five minutes to de-hiss it. It also pays to select less severe settings for the restoration parameters and pass the audio through the program many times.

### CONCLUSIONS

*DART Pro* is for users like you and us. It doesn't cost a lot, and as there are only three parameters to set, it's very easy to use. The disadvantage is that the results can range from excellent to unusable — and you may have to experiment quite a bit before you get something good. Fortunately, when the results are good, they're a lot better than what you can achieve with the EQ on a mixing desk or other noise reduction systems associated with analogue tape decks; once we had got the hang of *DART Pro*, every recording we tested sounded better after it was processed than it did before. It's certainly worth the money if you have more than, say, half an hour of audio that needs cleaning up: it all depends on how important the material is to you. In all, this program is well designed, easy to use, and includes a wealth of effective features for its price. We definitely recommend it.

SOS

**E** *DART Pro* £299; *DART* (cut-down version lacking DeNoise and DeHiss options), £89; upgrade from *DART* to *DART Pro* for existing *DART* users, £49. Prices include VAT.

**A** Et Cetera Distribution, Valley House, 2 Bradwood Court, St Crispin Way, Haslingdon, Lancs BB4 4PW.

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**PAUL WHITE** talks to *Symetrix President Dane Butcher* about the birth of a new PC hardware range, *Lucid*, intended to open up the world of high-quality computer-based digital audio at an affordable price.

**L**ucid is a brand new name in digital audio, though it comes under the design and manufacturing umbrella of Symetrix, the well-known US signal processing company. I arranged to meet Dane Butcher, President of the company, at their Seattle headquarters, where he explained the philosophy and direction of the new line. I began by asking him why he felt the need to develop a new brand name for the Lucid range of products rather than marketing them under the Symetrix name.

"Our existing Symetrix brand products serve a number of different audio markets, and though that's great, you also tend to dilute your marketing efforts because of that. With Lucid, we had a singular vision based on the ubiquitous Personal Computer music platform, which is getting more powerful at an ever-faster rate. Having had a personal interest in computer-based audio for the past 10 years or so, and having made some investments into those markets already, we decided to set up a new brand to pursue the desktop audio market.

"Our core expertise is the design of hardware and digital signal processing. We don't have

expertise in specialised desktop audio software, but we perceive a need for more hardware-specific peripherals to PCs, as more sophisticated alternatives to inexpensive soundcards. We're looking at all kinds of professional users, from multimedia to film production, and there are a number of software companies making hard disk editors and software plug-ins that have made some very creative and affordable products. We simply want to make it easier for the user to integrate those products into the studio — whatever type of studio that may be — by providing a hardware platform for digital audio interfacing and processing.

"Two years ago we didn't have the integrated MIDI + Audio packages that we do now — we had audio and we had MIDI, but rarely together. The computer still seems a little out of place in most studios, other than in its role as a music sequencer. Conventional studio equipment, such as ADATs, set the tone for the whole studio and how you work in it — computers look after the MIDI side of things, but still, relatively few studios use their computers for audio. The software people

# LUCID VISIONS

DANE BUTCHER OF SYMETRIX/LUCID



have the software to do it — it's just a matter of getting the hardware at the right price, and to the right formula."

## IN AT THE ENTRY LEVEL

**What are you introducing with Lucid that isn't already available from companies like Digidesign or from the better soundcards?**

"We're starting with a couple of low-cost, entry-level devices, one of which is a stand-alone, 20-bit A/D and D/A converter with both S/PDIF and AES/EBU ports, the ADA1000. Internally supported sample rates are 44.1kHz and 48kHz, with 32kHz added for the benefit of the broadcast market. Because the system is 20-bit, we'll be able to bring a system to market with in excess of 100dB dynamic range. This will be a cost-effective model, and won't include features like dithering — the US retail price is \$599 [see info at the end of this article for UK pricing of both products— Ed]. Symetrix already make a sophisticated 20-bit D/A converter with dithering and noise-shaping, but that addresses a different market. The second product we've announced is a NuBus card, the NB24, which simply functions as an S/PDIF interface, and will work under Apple's *Sound Manager*. This will allow the existing user bases of NuBus Macs to interface with our A-to-D/D-to-A converter."

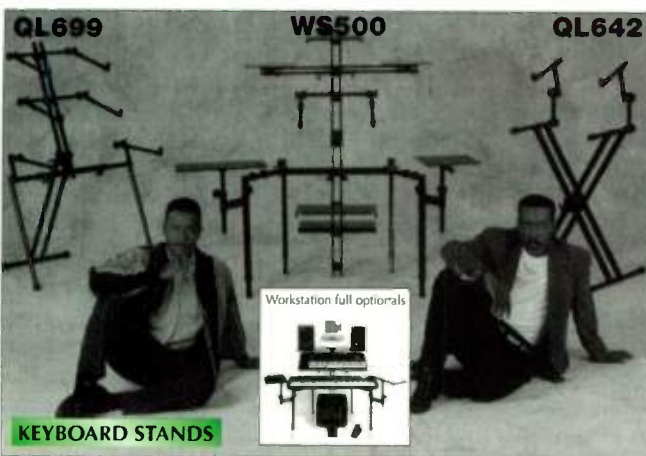
**So, if I'm currently using one of the major sequencer packages that supports audio, what will I need to make it work with your hardware?**

"We have developed a driver which simply sits in your PC's System folder and your sequencer will see it. We went for the NuBus card first because of the size of the existing user base. This



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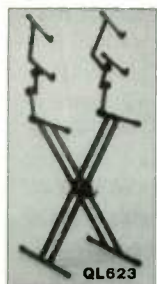


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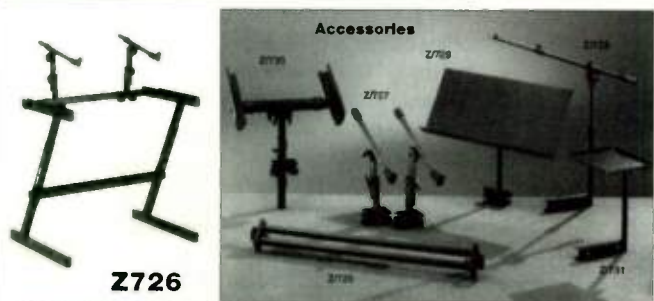
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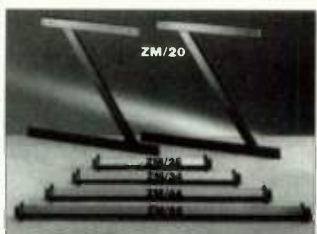


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# DANE BUTCHER OF SYMETRIX/LUCID

- ▶ card carries a \$399 retail price, and we have a second card in the planning stage, which will address the Mac and PC PCI platforms.”

## THE FUTURE

One thing that seems to bother a lot of *SOS* readers is that the majority of budget hard disk systems provide only stereo in, stereo out operation, yet what people really want are multiple outputs — which are normally expensive. Are you planning anything to help these people?

“Though our first product is a 2-channel interface, what you mention is the logical next step, and we’ve put a lot of thought into it. We think that people in the music market need cost-effective hard disk recording. Two tracks is OK for stereo editing, multimedia or for entry-level music, but in terms of interfacing for the real world, where music and post-production people are concerned, multiple outputs are obviously demanded.”

**Will this include ADAT and DA88 interfaces?**

“Absolutely. We’ve signed up for licenses for both those formats, and we think it very important to be able to interface with those machines. These may not be on the first generation of interfaces, but they’re planned.”

**I imagine that some user demands come as a result of habits picked up recording on traditional equipment. What you think you want isn’t always the same as what you need — for example, if you have a system with built-in mixing, you can often get by quite happily with two main outputs and two aux send outputs.**

“Exactly. But the computer will have to move up to how people want to work. It’s like I was saying about bringing the computer into studios — it gets used for MIDI, but it doesn’t get used for audio so much, because it doesn’t have those blocks of eight outputs. You can buy an interface to do the job, but they’re expensive.”

**They seem more expensive now that the audio sequencing packages themselves are so cheap and offer so many DSP-driven features.**

“Yeah, there’s a couple of things that drive our efforts into this market, and one is DSP power. The soundcard as we know it is remarkably short on DSP power, and though multimedia cards and software make token gestures towards audio, the computer industry has no interest in becoming too vertical in supporting any one discipline. They have to remain general-purpose — which means there’ll always be an opportunity to provide audio DSP cards that interface with the computer. That’s one area where we see opportunities. The other area is in multi-channel breakout boxes — but we’re staying away from the software side of the market.”

**How difficult is it to provide DSP power that other software companies can access effectively?**

“Our first card is a simple interface, and we’re probably not going to open that up in terms of DSP, but on our subsequent products, there will be APIs provided for companies that we’re developing relationships with. API is an acronym for ‘Application Programming Interface’, which in our case, will allow third-party developers — or DEVs — to load their DSP code onto the NB24 board. Our job is to provide as much raw horsepower as possible, so the software writers can decide how the DSP is applied. This is primarily looking at the plug-in market, but that’s not to discount the need for acceleration of audio or processors. You get a fair amount of processing power on a Mac 8500 or 9500 CPU board, but there’s always room for acceleration.”

**Will it always be a case of third-party companies writing specific software for your cards, or can it be structured so that your cards can run existing software?**

“I don’t really know whether anyone could write a bridging utility to do that with current plug-ins or not, but when I spoke to a leading plug-in development company, they started to salivate at the prospect of what Lucid offers. Apparently the mechanics of moving their algorithms onto a different hardware platform are quite minimal, given that the DSP card also has enough onboard RAM. Basically, you give the software designers the right hardware, and there’s no problem.”

## PC PROBLEMATIC

**When you start designing for PCs rather than the existing NuBus Macs, it seems that installing multiple cards can be problematic for the user.**

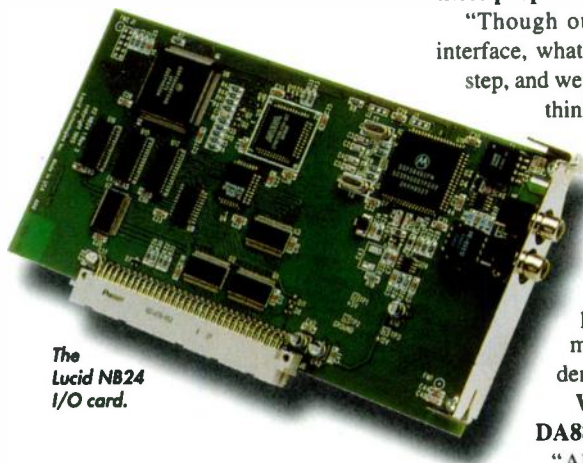
“There’s nothing much we can do at the card end to simplify that situation — our feeling is that some of the DSP power may end up being on the buss and some of it may be on the end of a wire — it may be distributed DSP. It doesn’t all have to be inside the computer. With the PCI buss, you want to put as much inside the computer as you can, but you do

“The soundcard as we know it is remarkably short on DSP power...”

have some options to put some of it outside.”

**Once you go the route of the virtual recording studio, it’s only natural that you’ll want to add some synth cards to provide a complete music package. By the time you’ve done this, you could end up with more cards than the PC can accommodate — so does this lead us back to the idea of the studio of the future being based around an external expansion chassis filled with PCI cards?**

“We have to take things one step at a time.” ▶



The Lucid NB24 I/O card.



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"The Studio Vocalist has enabled YES to perform multi-part vocals in live performance as well as adding a creative edge in the studio."



Warren Cuccurullo and Nick Rhodes of Duran Duran:  
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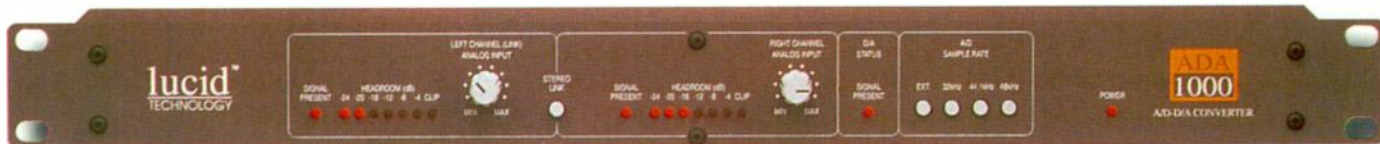


# DANE BUTCHER OF SYMETRIX/LUCID

► Our friends at Lone Wolf had a vision of all this distributed processing around the studio, but it turned out to be a formidable challenge. Anybody who thinks that we are not at the mercy of the computer companies is living in an absolute fantasy world. All we can do is watch and analyse any new thing that comes out. The Universal Serial Buss for example — OK, what are we going to do with it? It's a little wimpy and it may make a fine control buss — I could be shown to be wrong, but I don't think we need to be putting audio down it. But no doubt other audio companies will."

but we're hoping to be not a lot more expensive than what's currently available to them, so that they can step up in quality quite cost-effectively. After all, their ears are already educated to that level of quality — it's just their bank balances that are a little short. Just think of the quality advances brought about by products such as ADAT and DA88 — just a few years ago, people didn't have access to the sound quality they do now."

**So, you perceive Lucid as, effectively, a sound quality upgrade? You can still use the same MIDI + Audio sequencer as before**



The ADA1000 A-D/D-A converter.

"At the moment, the PC is a tremendously unfriendly environment in terms of RF. It's hard to imagine how some of these systems pass the CE test, but I guess they do."

**On the subject of being at the mercy of computer companies, they seem to have established a habit of changing their card slot format without considering the implications for either users or manufacturers. Surely this is another argument for keeping as much processing power externally as possible?**

"That's a good point and I fully agree. We certainly don't intend to dismiss the idea of putting some of the DSP out at the end of cables."

**On the hardware side, there are practical reasons for putting your converters in external boxes (for example, to eliminate crosstalk from the computer circuitry itself), but as far as the rest of the system goes, it seems most cost-effective to put it on cards which reside either inside the computer or inside some external hardware. Is that how you see the situation?**

"At the moment, the PC is a tremendously unfriendly environment in terms of RF. It's hard to imagine how some of these systems pass the CE test, but I guess they do. The low end of the market — soundcards, the low-end audio I/O cards and the audio that comes built into the Apple Macintosh — is very much compromised by this. At best, you're lucky to get the equivalent of 14-bit resolution out of them, and much depends what's plugged in adjacent to them."

## RAISING THE STANDARD

"Over the last 10 years, I've been in awe of the elevation in standards of the listening public. Every year, people get more discriminating, and for that we can thank things like Dolby in the cinema — also, TV is getting better, and will get even better soon with HDTV. Because of this, the quality of low-end soundcards is becoming simply unacceptable to a larger number of people."

**But the low-end cards are very cheap — they cost perhaps 10 percent of the sales tax on a professional product, yet some users still complain when they don't perceive the results as professional quality.**

"The entry-level musician will always be there,

— it's not a case of scrapping everything and starting again?

"Exactly — with our Mac card, it's designed to work with all existing applications. You take a disk, install our driver, and now you're going through our digital audio port. There are specialised exceptions such as Digidesign's *Sound Designer* which requires their hardware to work, but I think *Session 2.0* will work OK because it can run via Apple's *Sound Manager*. Those supporting Apple's *Sound Manager* include Opcode, Macromedia [*makers of Deck — Ed*], Emagic, Bias [*makers of Peak — Ed*] and Steinberg, so most of the major players are covered."

**Are you likely to implement any of your existing analogue Symetrix products in DSP form within the Lucid range?**

"That's not something we've thought about — I feel that when it comes to computer audio, the plug-in software approach is the way things are going. But I do think there should be more affordable sample rate converters on the market — nobody seems to be doing them, so that's one area we could move into."

SOS

**E** The Lucid NB24 and ADA1000 are expected to be available in the UK before Christmas. Prices are around £300 for the NB24 and around £450 for the ADA1000.

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# Smooth Operators

## YAMAHA TX802 FM SYNTH MODULE

**PAUL WARD dons a Miami Vice-style jacket and a pair of pink-rimmed Armani shades, and travels back to the '80s heyday of FM synthesis for a look at the one-time flagship of Yamaha's synth range, the multitimbral TX802 expander.**

Yamaha had a runaway success with FM synthesis (see the 'Classic FM' box) in the 1980s, starting with the release of the 6-operator DX7 in 1983, and moving through a seemingly never-ending series of both 6- and 4-operator spin-offs. The commercial success of FM synths was very much reflected in the music of the day: classic tinkly FM electric pianos, spiky 'chopper' basses and an endless supply of percussive sequence sounds were mainstays of many hits produced from the early '80s onwards.

### INTRODUCING THE TX802

Released in 1987, the TX802 was, to all intents and purposes, the swan song of 'traditional' DX7-style FM synthesis. Containing the same 6-operator sound generation circuitry as used in the DX7IID and FD keyboards (released the same year), the TX802 module was compatible with the data of all its 6-operator predecessors, and made a valiant effort to alleviate their shortcomings in the process. If I were to sum up the TX802 in a couple of

words, the 'flexible friend' cliché instantly springs to mind. Not only will it function as eight individual two-note polysynths ('Voices'), each with its own individual audio output, but any number of these Voices can be tied together to provide more polyphony if required, and sent to either, neither, or both of the two mix outputs. At one extreme is the capability for 8-part multitimbral operation (with each note boasting 2-note polyphony) and at the other extreme, the TX802 can be a single-voice 16-note polysynth. Any combination between these two extremes is also possible. OK, so we've all got used to the dynamically-assignable polyphony of more modern instruments, but at the time of the TX802's release, this was about as good as things got. Happily, the system for assigning Voices is extremely easy to master.

Although a Voice's two-note polyphony may seem quite restrictive, in practice it causes very few problems. Apart from pad chords and piano lines, most bass, melody, and typical 'sequencer' lines (you know; widdly, repetitive eighth- or sixteenth-note patterns) are largely monophonic. So, assign four Voices to handling a pad, use two more to double up a fat bass line, and you still have two Voices left over for percussive marimba and log drum lines. Each musical part responds on its own MIDI channel, and emerges from its own dedicated audio output. To all intents and purposes, you are now running four DX7s in your rig!

### SOUNDS (OF THE '80S)

Once you realise that polyphony is so rarely a problem, you begin to wonder at the wastage prevalent in the mighty TX816, with its row of eight TF1s (DX7-type modules). At one time,

I was running five TX7s (the rack version of the DX7), sometimes stacking two or more together with detuning to produce killer basses or complex lead sounds. The extra 15 notes of which each module was capable were never put to use! The TX802 will produce identical results (only with less output noise) in a much more convenient package. FM sounds are typically best suited to monophonic lines in any case, since they arguably lack the 'warmth' of analogue and the subjective accuracy of

"...the TX802 was the swan song of 'traditional' DX7-style FM synthesis."

modern sampled sounds. For chunky bass riffs or percussive sequences, FM really takes some beating. Simply duplicating a sound on a pair of Voices and detuning them makes for some very rich sounds, especially if the results are also panned across the stereo image.

Yamaha endowed the TX802 with 128 factory preset patch memories held in internal ROM and a pair of user RAM banks, each capable of holding 32 patches and 64 'Performances'. An optional RAM card holds a further 64 Performances and two banks of 32 patches. The factory presets obviously benefited from the years that FM had already been in service, since they are mostly excellent. And that's not to say that the ones on the original DX7 were bad, merely that expectations had moved on by then! Patches such as 'Superbass', 'Nu Marimba' and 'FullTines' really show what FM is all about at its best. But when Voice patches are combined in a TX802 Performance, things just keep getting better: there are the sort of layering and key split options previously available only on the mighty (and mightily expensive!) TX816. Personal favourites include 'Fazz Synthe-Lead', which is big and nasty enough to look after itself in a darkened alley, and '12 String Guitar', which makes many sampled attempts sound pale and lifeless by comparison. Quirky features include 'Alternate' where linked voices play alternate incoming notes. With a selection of similar Voice patches and some clever panning it is possible to have





## CLASSIC FM? — FM SYNTHESIS

FM (Frequency Modulation) synthesis brought a whole new breed of sounds to keyboard players — and baffled the hell out of many of them when they tried to program their own. Understanding FM synthesis at its most basic is not really very difficult; the complication comes in putting all the components together in a musically meaningful way. Here's a quick 'bluffer's guide' to some of the terms connected with FM:

### • OPERATOR

This can be thought of as a digital oscillator. In most incarnations of FM, such as that used on the DX7, the operator is only capable of producing a sine wave. The more operators you have, the more complex waveforms you can produce. The DX7 has six, whilst its budget-conscious cousins the DX9 and DX21, for instance, have four. Each operator is capable of behaving as either a Carrier or a Modulator (see below).

### • CARRIER

This is an operator that is responsible for producing an actual audio signal.

### • MODULATOR

This is the other kind of operator. Modulators are not responsible for producing any audio, but instead, as the name suggests, act solely as a modulation source, imparting their waveform onto a Carrier to produce a more complex harmonic content. By varying the amplitude and frequency of the modulator, the harmonic content of the resulting waveform can be dramatically changed, and by using an envelope generator to alter the modulator's amplitude and frequency, sounds can be created whose tone changes over time. It's also quite possible for a modulator to act upon another

modulator — which is where the complexity and confusion usually starts! The principle of arriving at complex waveforms by adding harmonics explains why FM is referred to as a form of 'additive' synthesis.

### • FEEDBACK

It is quite possible for an operator to loop its output, and effectively modulate itself. In Yamaha's incarnation of FM, this is mercifully restricted to one operator per algorithm.

### • ALGORITHM

This is simply a configuration of operators, specifying which are to be carriers and which are to be modulators. By making all of the operators into carriers, you have the makings of a simple tone-bar organ. At the other extreme, if you make only one of the operators a carrier, the remaining operators are all available to act as modulation sources, and extremely complex waveforms can be produced.

The continuing obsession with all things analogue seems to have sent FM synthesis into the wilderness between the realms of 'newest is best' and 'they don't make 'em like they used to' — FM just ain't hip. But for anyone who judges musical equipment by using their ears, rather than by the fashion pages of *Hello*, the value for money factor ratio of the Yamaha DX/TX range is very favourable. Forget trying to make a DX21 sound like a Minimoog — it's never going to happen. Instead, delight in the quirky metallic twangs, pings and thunks at which FM excels. Mix them in with a couple of analogue synth loops and you might just be responsible for setting off a second-hand FM synth boom in the late '90s.

sequence lines spinning around the speakers with ever-changing contrasts in tone and colour.

## DX7 OR TX802?

Yamaha's DX7, arguably the most famous FM synth, is rumoured to be a collectors' item in Japan these days. Whilst I usually take these 'big in Japan' stories with a healthy spoonful of translucent crystalline seasoning, I can quite imagine this being the case. The TX802 may not be as famous or as 'instant' in its appeal as the venerable DX7, but for those in the know, it is a far better instrument and runs rings around its older cousin. Having used a clutch of TX7s as my FM sound sources for more years than I care to recall, the TX802 somehow managed to slip past me until just recently, and how I wish I had made the discovery earlier! If you hanker after FM sounds, there is no finer machine in which to find them than the TX802. For those who already own one — why have you been keeping quiet about it all these years? Ah, I get it...

SOS

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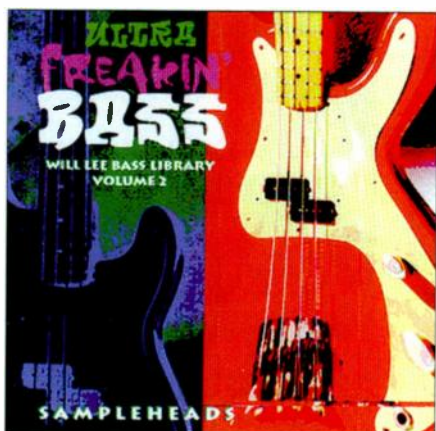
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Our regular look at the hottest new sample CDs and CD-ROMs.



**ULTRA FREAKIN' BASS:**  
**WILL LEE BASS LIBRARY**  
**VOLUME 2**



(DOUBLE AUDIO CD)

Track 1 of disk 1 is Will's intro, which he uses to talk and play us through demos of the basses and pedals used on this CD. He also includes tips and hints, like using the back pickup for a more nasal sound, *a la* Jaco Pastorius.

Most tracks sport one favourite riff played competently in one or (more usually) several keys. Blues, rock, Latin and funk influences dominate, though a variety of styles are offered. Playing is excellent, though the more soulful tracks sound less authentic — when a JB feel is attempted, it somehow misses the spot. Many riffs are pastiches of style clichés — you might not have heard them before, but they sound familiar.

Track 38 has some sweet chords, and track 39 a nasty but nice effected bass pattern (Bass Balls or something? The sleeve notes leave much to the imagination). Track 40 offers close-tone multisamples of same, and at last I feel the urge to turn on my sampler. Track 48 has a nice multi of short, very colourful and low bass notes which accompany the preceding riffs. A new dance classic for the taking (why am I telling you this — I should have kept it all to myself). And while we're at it, don't miss the wah-wah slides on tracks 57 and 58. Sounds like a young James Brown caught in the zipper. The fret

noises on track 61 might provide an alternative to scratching.

Track 62 trails another Sampleheads product. I wondered when sample CD manufacturers would start to do this — it seems such an obvious, if irritating, move. Thirty-five minutes in, and that's the end of Disk 1. Pretty short, eh?

Disk 2 kicks off with a repeat of Will's intro, after which there are close (often semitone) multis of all five of the basses used, including sustained tones, muted tones, pulls, drops and slides, FX (or EFX, as the Americans say), harmonics, and so on. (Some of the basses mentioned in Will's intro don't show up, so I guess they appeared on Volume 1.) The chosen few offer a good variation in tone, and the evenness of successive notes and firmness of bottom end were strikingly evident two rooms away from my control room (often a good way of checking what something really sounds like). For the record, the bassography on Volume 2 is as follows: Sadowsky 4-string, Pedulla 8-string fretless, Spector 4-string, Fender Jazz fretless (I've heard of that one!) and a Yamaha 5-string acoustic fretless. All sound on the money, and probably a lot of money at that. Remember Phil Lesh's Alembic? The solids are as good or better. Running time? A respectable 65 minutes or so.

In conclusion, Sampleheads wanted to create a bass sample CD which did not sound like a keyboard triggering samples, which is 'un-bass sounding', to paraphrase Will. Well, I guess that's why anyone would buy any of the bass sample CDs already on the market. So let's not claim a revolution here — instead we'll see how it stacks up against the competition. The Disk 1 riffs are generally none too original, and because Will has usually chosen to play the same riff in a multitude of keys, there are not nearly enough variations in any one style to build up a convincing live bass track. Dance-wise, there are a few gems to be mined, but not enough to justify a purchase unless you're minted. On Disk 2 we find some really classy bass multisamples — about the best I've heard. You could use velocity switching between patches to add programming realism. However, there's a lot of sampling work here, and, quite frankly, the tedious, repetitive mapping out of all these tone

samples is a job someone should do once, not one to be repeated by every purchaser. With heavy multisamples, go for the CD-ROM every time (if there is one — and check that it's compatible with your sampler).

In general, however good the tones are, the discerning ear will be able to tell a sequence from a snippet of live playing. What a pity there were not many, many more fragments and variations from which to sculpt an original, convincingly live bass track. The best you can do here is lay down a foundation of one or two off-the-peg riffs, and add keyboard-induced note detail over the top — not the same thing as playing around with and re-sequencing 10 or 20 live fragments (think how many ways there are to order 20 2-beat fragments over a 4/4 2-bar loop!). Based on how useful this CD is to you, and not on how well it was produced, I award it three stars. I'd probably give a decent four stars for a CD-ROM product at a good price. *Wilf Smarties*

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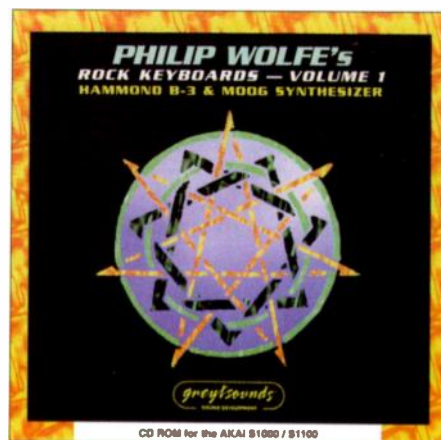
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**PHILIP WOLFE**  
**ROCK KEYBOARDS**  
**VOLUME 1**



(AKAI-FORMAT CD-ROM)

This Akai-format CD-ROM concerns itself mainly with rock Hammond B3 organ sounds, all beautifully sampled, with exactly the right amount of 'dirt' and a choice of fast or slow Leslie speeds where appropriate. Most popular





drawbar settings seem to have been included, along with various percussive attack sounds.

In theory, Leslie effects shouldn't really work on samples, because in real life, the rotary speaker effect is applied to the whole sound, not on a note-by-note basis (where the modulation is bound to be out of sync with that on other notes). However, this doesn't seem to detract from the overall result, which has all the power, punch and attack of a real Hammond. Because organs are not naturally velocity sensitive, velocity switching has been used to good effect on a couple of programs to change the Leslie speed. All you have to do is load both the fast and slow Leslie versions at the same time. There are also organ bass pedal samples in 8-foot and 16-foot versions, with and without Leslie.

Of course, rock music isn't all about Hammond organs, to the exclusion of all other keyboards, and neither is this CD-ROM. There are three volumes of synth sounds, including Taurus bass pedals, filter sweeps, analogue strings and synth brass, courtesy of a PolyMoog. While not being in any way revolutionary, these are good-quality samples and they all work well. The collection concludes with some nice modulated filter and sample-and-hold sounds, but you can't help wondering what happened to the Mellotron, or even the slightly dirty Fender Rhodes piano. There aren't even any of the classic Minimoog leads, which I thought would have been obligatory — perhaps these are being kept in reserve for Volume II?

Though this isn't a hugely varied collection when taken in the context of rock music in all its forms, the quality of the organ sounds in particular makes it a very worthwhile buy for anyone influenced by the great Hammond players of the '60s. Rates a 3.5, and probably more if you're a Hammond freak! *Paul White*

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## ALI BABA AND THE 40 RAVERS

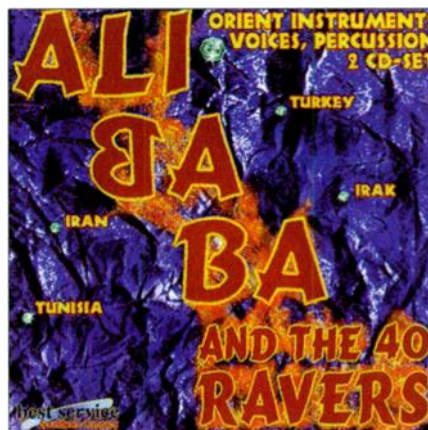
(DOUBLE AUDIO CD)



Very much in the style of their previous release, *World Colours*, Best Service (those sampling Ubermeisters from Bavaria) proudly

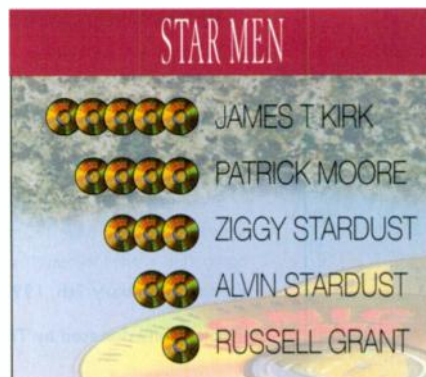
present Ali Baba and the 40 Ravers.

This two audio CD set brings together sounds and performances from all over the Arabian world — namely Iran, Turkey, Tunisia and Iraq. Each of the two 99-track CDs times out at well over 65 minutes, and each is packed full of interesting and unusual sounds that will add 'Turkish delight' to seemingly



any track. If you aren't an expert on Middle-Eastern instruments, it's unlikely that most of the sleeve notes will mean very much to you, short of telling you whether the samples appear in mono or stereo, and occasionally what their BPMs are.

Among the instruments featured are the Ney flute, Tanbur, Kanun, Saz, Darbuka, Kaval and Cura. Between them, they deliver all manner of plucking, blowing, and banging. As you might expect, there's also a very heavy bias towards percussion riffs and phrases. These form, more or less, the strongest element of this release, and are just the sort of tabla-type performances you could expect to accompany your next Balti meal.



The biggest problem I found when using this CD was that the sounds don't appear to have been performed with sampling in mind. In fact, it's patently obvious that, almost without exception, these samples are sections of fully-recorded songs and musical performances that somebody has neatly chopped up ready for us (the punters) to sample and stick back together again — hardly pushing the boundaries of the creative process. This certainly explains why so many of the 'samples' are recordings of a full band. OK, it's a well-recorded, authentic-sounding arabian-style orchestral band that sizzles and pops with spice and originality, but you really do get the feeling that the performances here were not originally performed and produced with the aim of making a sample CD.

With this in mind, the best tracks are those where an individual instrument is given the time to perform solo lines and phrases. The Ney flute, for example, is magically usable, as are some of the Saz, and Tanbur tracks, but overall I found myself skipping past nearly all of the full band recordings, as there was just too much going on in them to warrant any serious use. This is a real shame because, as with the eminently-usable percussion licks and string lines, you get a real flavour of what is sonically possible when you integrate traditional ethnic samples with a contemporary musical backdrop. I can also see quite a few users feeling somewhat short-changed by the fact that although the word 'Voices' is mentioned heavily on the front cover, I failed to find a single voice sample that wasn't accompanied by at least three other instruments playing along with it. Be warned.

As I see it, this CD proves a couple of things. Firstly, when intelligently performed and produced, there will always be a market for unusual and interesting sounds from around the world. And secondly, simply buying up the rights to a handful of instrumental recordings, slicing them up and presenting them in a sort of 'painting-by-numbers' approach does not a good sample CD make. *Paul Farrer*

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  - b. 32
  - c. Er... pass
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  - d. Gibbon mode

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**F**ed up of mixing manually? Wish some enterprising manufacturer would release a plug-in 'pair of arms' hardware upgrade for the human body so you can mix your latest opus, complete with all those tricky fades? Well, worry no longer, for this month SOS have teamed up with mixer automation manufacturers Optifile and their UK distributors The Home Service to offer you the chance to win a Drax VCA mix automation system, worth over £2000! Best of all, your body need undergo no major plastic surgery if you win.

**NOTE**  
The prize offered is a 24-channel Drax system, comprising the VCAs, a PC interface/CPU unit, a power supply, and the front-end Drax PC software. Please be aware that a Pentium PC running Windows 3.1 or higher is required to run the software — it is not available for other computer platforms. Installation of the Drax system will be carried out free by The Home Service to owners of Soundcraft Ghost and Mackie 8-buss desks, provided the cost of shipping the desk to The Home Service for modification is borne by the prizewinner. There will be a charge for installation to prizewinners who own other desks: contact The Home Service (0181 943 4949) for details. The cost of returning the desk to the winner following installation will be paid by The Home Service.

A VCA-based hardware system with a PC software front-end (see the 'Note' box for further details on the system), Drax will record all the movements of your desk's ordinary channel faders and mutes into the Drax PC software, where your mix data can then be edited. Once recorded, individual fader moves or mute settings may be replaced with new information by performing another mix pass, or, if you're nearly happy with what you've recorded, you can modify existing data using the Update mode. The mix data can then be saved to your PC's hard disk for retrieval later. As you record your moves, the mix information is displayed on your PC monitor, and the level display changes on-screen as you play back your mix. For maximum speed and ease of use, the Drax software offers keyboard shortcuts for all recording functions, freeing you from the need to break off

from mixing to mess around with a mouse!

So, if you've got manual mixing-related mardness, and you'd like the chance to win this great system, just answer the four questions on the left, and complete the tiebreaker in a manner I likely to cause the SOS staff to break into broad gins and cry 'that's the one!'.

If you need help with the questions, take a look at Paul White's review of the Drax system, starting on page 172 this month, where all the answers can be found. Post your completed entries to reach us no later than the competition closing date:

**Friday, February 7th, 1997.**

Prizes kindly donated by The Home Service (0181 943 4949).

### the small print

1. One entry per person permitted. 2. Employees of SOS Publications Ltd, Optifile, The Home Service, and their immediate families, are ineligible for entry. 3. No cash alternative is available in lieu of the stated prize. 4. The competition organisers reserve the right to change the specification of the prize offered. 5. The judges' decision is final and legally binding, and no correspondence will be entered into. 6. No other correspondence is to be included with competition entries. 7. Please ensure that you give your DAYTIME telephone number on your entry form. 8. Prizewinners must be prepared to make themselves available in the event that the competition organisers wish to make a personal presentation.





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KAT

**Recording Venue:** Home.

**Recording Equipment:** Atari ST running *Cubase*, Spirit Folio 12:2 mixer, Yamaha Rex 50 effects.

This tape kicks off with a distorted and modulated pad keyboard sound, then builds the groove around it, which is something I haven't heard on a demo before. It might appear from the start of the track that Kat are about to launch into a hardcore techno mix, but in fact the looped drum break is pretty mellow, and real bass guitar lends the mix a certain warmth in the bass frequencies.

This all suits the female vocals, sung in a soulful way by Claire McCarthy and mixed with very little in the way of effects. The reason for the dry vocals could be that they were recorded live to DAT over a backing track triggered from the Atari running *Cubase*. Even so, some echo would have worked to help the voice ride the mellow groove of the backing track. I would suggest a long echo with a 25% feedback setting as a starting point for this kind of track. The delay time is probably best set to match quarter-beats on a basic delay. If this is not possible (the Rex 50 listed does not have a long maximum delay time) then go for triplet delay and keep it lower in the mix most of the time, fader

riding it for those special moments that work with more delay on the voice. In larger studios with more equipment, it's not uncommon to have several delays with varying delay times patched in, which can then be used in the mix as and when necessary.

On the next track, swirling keys and looped, blocked chords again lead the listener to the false assumption that a four-on-the-floor acid house beat is about to kick in. It's a relief when the dub bass line, drums and percussion

enter, supplying the rhythm section to the mix. Yet the bass sound has just a bit too much upper-mid for dub, with a lot of attack to the note, and this could have been rectified on a desk like the Spirit Folio by turning the HF EQ down by about 9dB. Generally, Kat are a nice mellow-sounding band with some good ideas, but I would like to hear the vocal side developed more. □

## LONSBORO

**Recording Venue:** Home.

**Recording Equipment:** Atari 1040 STe running *Cubase V2*, Mackie 1202 mixer, Atwa ADF-450 cassette deck.

LONSBORO

"TESTING THE WATER"

Produced & Arranged  
By A.M. Selby

Andrew Selby is the man behind the name, and has been writing his own music for four years. Of late, he's been specifically concentrating on writing vocals in a Euro pop style, but for this demo he's decided to submit two dance tracks.

Perhaps this is for the best — speaking as someone who has just returned from the European mainland, I can say with authority that when Euro pop is good, it's fun. When it's bad, it's absolutely dreadful!

The rhythm of the first track is set up by a fat, echoed wind synth sound which has been panned

with all the echo to the left. This is effective, but could have been improved with the dry sound in the centre and the stereo echo panned to each side. I notice that later in the arrangement two snare drum roll parts are used in counter rhythm — panned hard left and right. This in itself is OK, but the leading, on-beat snare is panned to the same side as the dry keyboard, and it would have been nice to reverse the panning so that the listener is not always drawn to the right of the stereo image. A long-decay bass drum sound on fours carries the bass end of the mix, its note mingling with the long decay of the droning bass synth with no apparent discordant effects.

As a composition, the first effort rolls along in a jolly fashion, but the phrase 'test-card music' springs to mind. This impression is reinforced by the clean, digital quality of the sounds chosen on the Korg 01W/FD, and this is evident on the second composition too. After a promising start — a recording of a station platform, complete with announcements — a nice rhythmic groove is set up, but the main theme is then carried by a pan pipe sound. I think we've all had enough of pan pipes by now, and thankfully this doesn't last for too long, being replaced by strings and a spoken vocal, saying "Lead me to pastures new". Nice concept, but it could have been delivered with more longing, perhaps more in a whisper. Even so, I really liked the return of the station platform ambience at this point behind the voice. □

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**Recording Venue:** Home.

**Recording Equipment:** Allen & Heath GL2, Alesis ADAT 8-track synchronised to Tascam 38 with dbx noise reduction, Panasonic 3700, MOTU Mixer 7s and Apple Mac Centris running Unisyn, Digital Performer and Sound Designer II with an Audiomedia II card, Electrovoice ND257B mic,

Telefunken mic pre-amp, borrowed Neumann U87 mics, QSC power amp, Yamaha NS10 monitors, Behringer Composer, dbx 1066 compressor, Lexicon LXPI effects, Yamaha REV5 and SPX90 effects, Roland SRV2000 reverb, Rane graphic, BBE 422A enhancer.

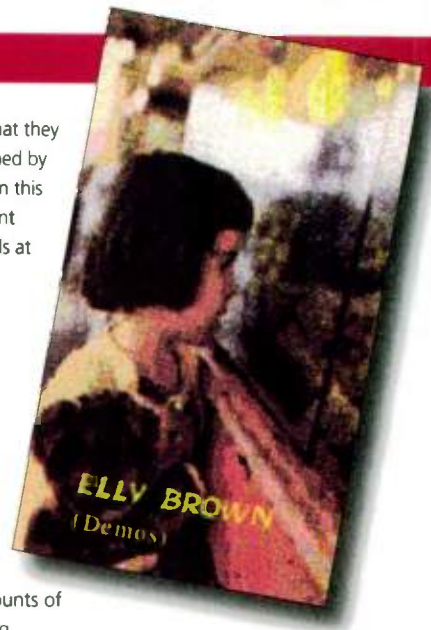
This demo showcases some well-considered songwriting and production from Elly

Brown and collaborators in Katonah, NY, USA. The drum sound is solid, with a lovely lightweight pop snare reminiscent of Stewart Copeland. It's high up there in the mix, but never intrudes on the light rock/pop sound of Elly's voice. It's important to get the frequency ranges of these sounds to complement each other if you intend to feature both in the mix, as most rock/pop production has done in recent years. With a good-quality microphone and preamp, you should find that the voice, especially a female voice, has a lot more going for it in the upper part of the frequency range to distinguish it from the snare. Another trick if you already have a hard snare sound committed to tape is to find the area of the vocal which has most energy and clarity, then cut the snare EQ in that region a little. In the case of this demo, as there is no credit given

for drums I'm assuming that they have been well programmed by co-conspirator Bob Riley. In this case, it's easy to experiment with different snare sounds at any point in the recording process.

The main point of interest on this demo, however, is Elly's voice, which is excellent, and she also does rather good multitrack harmonies, nicely spread across the stereo image and treated with copious amounts of reverb on the second song. Sometimes country rock in feel, sometimes reminiscent of Chrissie Hynde's use of vibrato, the voice is definitely what sells the demo — and that's what record companies want to hear. It seems that Bob Riley (a subscriber to SOS) is the main man behind the desk, and he's made a good job of it, whether dealing with guitars, drums, vocals or keys. There's some thumping and noise

going on in the background on the ballad, which might have been dealt with using a low-pass filter, but this is probably only audible on headphones. I was more concerned with the sibilant vocals on this track; possibly this has been caused by over-use of the BBE Sonic Maximiser, and a de-esser might have come in useful. Otherwise, this tape is excellent. □



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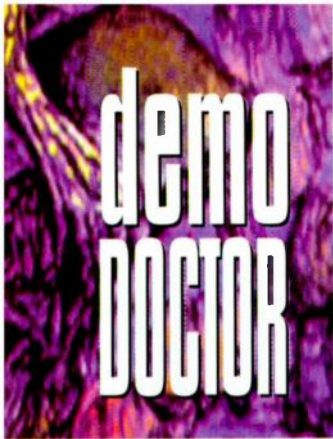
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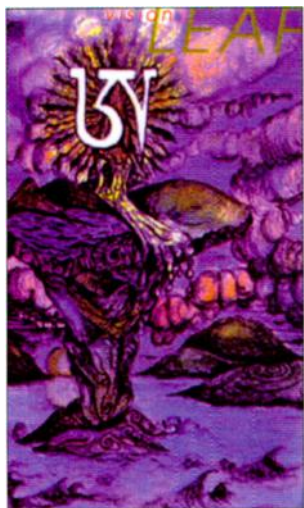
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▶ QUICKIES

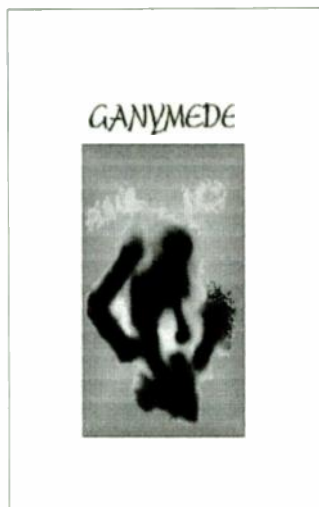
**LEAF:** Recorded by Richard Steven at home in Falmouth, this tape has an atmospheric quality to it at the start, and swirling chords suggest tension before the tribal conga rhythm cuts in. There's some nice use of stereo effects, although these are probably the ones built into the sounds generated from the keyboards used. The reverb on the powerful drum track, when it comes in, is another matter. This is too long, and creates a wash of sound on the mix that muddies the overall sound. My only other comment on this first track is that once the impact of



the drums has been made, the track doesn't really develop from there, and goes on for too long. The second track holds the interest better, with a thunderous, rolling bass line which benefits from the reverb added to it, and a voice disembodied by the use of effects. The spoken vocals, against an industrial-style synth backing, have been treated with echo, reverb and modulation, but do not get lost in the mix. And there's a nice touch when

the Eastern-style electric guitar break comes out of the vocals for the end. Incidentally, the cassette I had was over-recorded, so watch those levels!

**GANYMEDE:** Richard Askew, recording at home, has produced a tape of instrumental music with some nice ideas, aimed at the advertising market. The compositions tend to rely on a



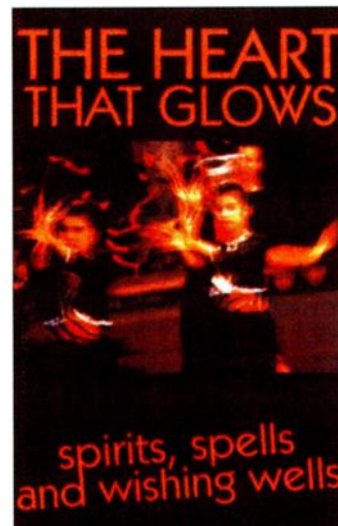
simple rhythmic backing, adding punch by the use of atmospheric synthesized sound effects. On the first piece, these stabs of sound come out of stereo left and are often panned or heavily treated with reverb, to fly across the stereo image. This is effective, but the impact is lost in the repetition, and I really think that some sort of hook or theme should have been developed to justify the length of the arrangement. It's interesting that Richard thinks that the tape, recorded with Dolby B noise reduction, sounds better with it switched off. I listened to it with both settings and I have to agree that the extra treble and compression improves the general sound of the mix. I would suggest recording without Dolby, especially as all the sounds used are digital and generate little noise when compared to analogue equipment.

With influences placed definitely in the dance and Euro pop tradition, **BUBBLE's** tape draws heavily on what has gone before for sound inspiration, from the flanged sixteenth notes of Japan and Duran to the vocal synth of Tomita and the more modern hard kick of Chemical Brothers and Leftfield. This collage is put into



high-energy form, and its sheer exuberance wins you over. I especially liked the breaks from bouncy bass line and strings into the resonant and heavily-enveloped vocal synth sound — a nice turn with a twist of humour. The second mix has a more modern flavour with a heavy, almost dub groove, but plenty of good ideas and sound changes to maintain the flow of energy without losing the thread.

Still plugging away, **THE HEART THAT GLOWS** have recently released a track on a compilation CD called *The Crossing — Fretwork Southeast Volume 2*. The band have been committed to using mainly electronics and technology but trying to keep an organic, band-like quality to the music, for some years now. It's a shame that they haven't managed to increase their popularity, but this could turn round for them with the current interest in Euro pop. One of the things that works against them is their production, which is very busy



and loaded down with effects. To make echo and big reverb treatments on instruments effective, you need some space to allow them to make an impact. Otherwise a wall of sound with little in the way of distinguishing features is the result. The second track is much better from this point of view, with far more clarity, especially on the vocals, which are still treated with a well-balanced stereo echo panned hard left and right. The guitar is not only played better here, but also sits nicely in the mix, with a lighter effects balance helping to blend the sound with the keyboards; this is also true for the third track.

Based in Ayr, Scotland, **ONE NATION** are a simple bass, drums, acoustic guitar, electric guitar and vocals outfit. The recording is fairly



elementary, but the feel of the band comes across well. The main problem areas in the recording department are the vocalist, who occasionally overdoes the energy bit (a good compressor would have been useful to control level) and the guitars, which are very thin. The acoustic sounds as though it has been DI'd from the pickup and then over-equalised, so that there is no lower-mid or bass in it at all. This would have been OK if the electric guitar was occupying that space, but it too lacks any lower-mid frequencies. Consequently the bass is out there on its own and was probably mixed higher to compensate for the guitars. The drum sound, however, is not bad, though it could have been higher in the mix. □



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£400; Peavey Spectrator organ sound module, boxed, manuals, £200. 01492 543512.

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**ENSONIQ ESQ1** with ROM, £350; Akai CD3000 10Mb, with analogue board, mint, £1500; Deep Bass Nine, £210; Studiomaster Sessionmix 16:2, £400; Alesis Midiverb 3, £170; Quadraverb Plus, £210; Dualflex, £65. 0116 267 1715 (Leics).

**ENSONIQ TS10** synth, on-board sequencer, awesome sounds and effects, loop facility, disk drive etc, boxed with manuals and disks, mint condition, £1050 ono. James 01924 828882 (W Yorks)

**FENDER RHODES SUITCASE 88** original classic, excellent condition includes amp, glorious sound! £500, no offers. Sam 01986 782359 (East Anglia).

**GEM 53 TURBO** workstation, great master keyboard, loads of sounds, MIDI, loads & dumps samples, SKB flightcase,

VGC, excellent production tool, £875 ono. Thomas 0115 916 2170.

**HAMMOND C3 ORGAN** Immaculate with full size pedal-board and stool (slightly scratched) complete with PR40 tone cabinet, £1695 ono. 01243 379833 (Ports).

**KAWAI K1** home use only, £150. Richard 01944 758536.

**KAWAI K1 MKII** with extra voices, £300; Roland JS30 sampler, £400; Yamaha RY10 drums, £100; Atari STE, monitor, software, £150. All as new with manuals. Andy 01451 820582.

**KAWAI K4** boxed with sound card, £320. Ben 01795 842849 (Eves).

**KAWAI K4** as new with manuals, £250. Roger 0181 870 9605 after 7pm.

**KAWAI K4 SYNTH** excellent condition, manuals, original box, a great synth for beginners or pros, 8-part multi-timbral, 64 sounds, plus three ROM cards, £400. Shane 01823 276602.

**KORG I3** mint condition, manuals and disks, offers, Tascam DAT machine as new, £525 ono. Andy 0191 2858293 (Eves).

**KORG I3** interactive workstation, immaculate condition, boxed, with manuals, home use only, virtually unused since purchased, £975. Graham 01606 882881 (after 6pm).

**KORG I3** workstation, new this year, home band in one box, extras, swap for JD800 or Korg Prophecy+ £200. I will pay carriage in UK. 01469 576487.

**KORG M1** Kawai K5R, Yamaha TG55; Sequential Prophet VS, all excellent condition. 01444 401143, 0410 937252

**KORG M1** With custom built case, box, manuals. Mint condition, home use only, £500. 01737 555935 (Surrey).

**KORG M1R** plus memory card and video manual, just serviced, excellent condition, £350 ono. Pat 0976 366297 or 0181 5220577 (W/ends).

**KORG M1R**, £350. 01225 480739, email bilbo@yellowradio.demon.co.uk

**KORG M1R EX** with T-series PCM data, VGC, £550; Yamaha DX7 plus extra ROM cartridges, £250. Russ 01992 445308 (Herts).

**KORG MONOPOLY** boxed, manuals, immaculate condition, fully working, £350; Roland MKS70 Super JX module with PG800 programmer, three ROM, one RAM cartridges, boxed, manuals, cards, excellent condition, £695. 0191 537 4817.

**KORG MS20** analogue synth, home use. mint condition, £330; Korg Delta polysynth, £150; Sequential Multitrak analogue, £350; Tascam PE20 parametric, £80. John 01389 751843 (Strathclyde).

**KORG MS20** manuals, £300; Korg MS10, boxed with manuals, £150; Korg MS02 interface, £60. Andrew 01379 678071 (East Anglia).

**KORG MS20** mint, £400; SQ10, offers; Mackie meter bridge 24.8, £400; Joemeek voice channel compressor, £400; Roland SBF325 flanger/chorus, £325; Roland SDX330 dimensional expander, £325. Oscar 003444114039 (Spain).

**KORG PROPHECY** boxed, mint, £750 ono; Yamaha V50 workstation, £425 ono swap for JD800. Ian 01539 723631.

**KORG PROPHECY** three months old with Modern Models and Analogue Vintage sounds in SysEx form, £750, Akai SO1, vgc, £400; Novation Drumstation, 4 months old, £390. 0161 224 0035 (Eves).

**KORG 01W/FD**, £800, Akai S950 fully upgraded, £600; Emu Proteus 1, £175; Novation Bass Station, £200; Spirit Folio Si, £200, ART Multiverb, £40 all boxed and with manuals. 0181 594 4370.

**KORG 01/W PRO X** 88-note piano weighted synth, mint condition, complete with Korg stand, pedal, manuals, etc, home use only, a magnificent machine, £1550. 01423 507279.

**KORG 01/W PRO SYNTH** plus two cards, best of M+T, synth design, £1100 ono; Korg Wavestation SR, £500 ono both excellent condition, boxed with manuals; home use only. Chris 01964 613296.

**KORG WAVESTATION EX** great condition, boxed, £695; Korg Micropreset analogue monosynth, excellent condition, £60. Nick 0121 354 3695.

**KORG WAVESTATION SR** boxed, £495 inc delivery, Oberheim Cyclone MIDI

arpeggiator, £75. Bob 01993 840575 (Oxford).

**KORG WAVESTATION** and piano sample, 3 performance cards, professional hard case, £600 ono. Lee 0191 416 5631 or 0191 201 5232.

**KORG X3** excellent condition with hard case, £690. 01207 509089 (Durham).

**KORG X3** boxed, £695, Yamaha SY55, £375, Roland D50, £375 all with manuals etc. Three-tier A-frame stand, £50; Roland EV5 volume pedal, £30. Paul 01229 466238.

**KORG X5DR EXPANDER** boxed as new unused. M1, 01, X3 sounds, £450 ono. John 01543 360686.

**KURZWEIL MICROPIANO** brand new, boxed, unused, £299. Wanted Alesis Microverb 1 or 2 (half-rack size) and Yamaha MDA digital multi-tracker, cash waiting. Paul 01723 351732.

**MOOG PRODIGY** VGC, £200, Moog Rogue, vgc, recently serviced, £180, Korg Mini 700, £149, Roland PR100 sequencer boxed, manual, £50, Elka Soloist 505, £50. 0116 283 5455.

**MOOG PRODIGY** mint condition, £275 ono, Roland SH09, mint, £275 ono, Casio CZ3000, mint, £160 ono. 0410 428352, between 7pm & 8pm.

**NOVATION BASS STATION** boxed, PSU and manual, will deliver, £220 ono. 01246 410799.

**OVERHEIM MATRIX 6R**, £450 ono, Bit99 with flightcase, £250, Kawai K3M, £200, Roland Jupiter 4, mint, £300; Studiomaster IMP2 16-channel MIDI mute, £75, Teisco 60F, £125, Roland digital MIDI faders, £50. 01394 387424.

**OVERHEIM O88** with MIDI and flightcase, £1200; Yamaha CS70M rare analogue, dual channel polyphonic synth with complex LFO, £700, ARP Odyssey (2800), £500. Steven 0171 625 9732.

**OCTAVE KAT CV/GATE**, £250, Roland SH1, £275, Juno 106, £425, Prophet 5, £750, TR909, £950, Wavestation AD, £795; OSC oscar MIDI, £850, Roland SH7, £850; Sequential Drumtrax, £175, M64C, £30. 0181 309 0615.

**OSCAR MONOSYNTH** MIDI, boxed with manual, never gigged, home use only, £800 or swap for Jupiter 6 or Jupiter 8. Eric 01555 772681 (Scotland).

**QUASIMIDI QUASAR** expanded version, excellent condition, £800; Roland Juno 6 analogue synthesizer, £200; Korg DW6000 MIDI compatible synthesizer, £200. 01934 642996 (Eves, before 10pm).

**RHODES 73 MARK1** stage piano, immaculate condition, reluctant sale, £350. 0181 894 7306 (Twickenham).

**RHODES VK1000** Hammond clone, £500; Yamaha TX16W stereo sampler 3Mb plus Typhoon alternative operating system, £500, Seck 18.8.2 MkII, mint, £500; Yamaha REX50, £100, Emu Proformance+, £150. Charlie 01422 883374 (Halifax).

**ROLAND D10** VGC, ideal first keyboard, good range of sounds and simple drum machine, with manuals and stand, £300. Matt 01705 756494.

**ROLAND D10 KEYBOARD** good condition, manuals and stand included, £300. Matt 01705 756494.

**ROLAND D50** and Steinberg D50 editor, soft carrying case, £350 ono. 01628 526469 (South Bucks).

**ROLAND D50** just the keyboard itself and a plug, good condition, just been made redundant with a Synclavier. Alex 01752 789454.

**ROLAND D50** good condition, £360, will negotiate. Alex 01752 789454, email 100764.3151@compuserve.com.

**ROLAND D50** £350, W30, £750, Fatar 2001 mother keyboard, £850. All in perfect condition in boxes. Peter 0181 777 12647 (Eves, or leave message).

**ROLAND D110** sound module, fully editable, boxed, manual, no scratches, very good condition, Atari ST editor, 3 discs of analogue sounds, TB303 etc, a snip at £250. Scott 01474 324410.

**ROLAND JD800** mint, boxed with manuals, £1250 inc delivery. Wanted: synth drums, Synare, Front Line X2, Impulse Linn Vll, Maplin 4600, 5600, Digisound, Oscar, broken bits. 01202 734739.

**ROLAND JD800** mint condition, boxed with manuals, home use only, £1350. Matt 01392 426014.

**ROLAND JUNO 60** + case, manual, £275, Roland SH1, £230, Yamaha EMT10, psu and manual, £100, Roland SH2000, £95, Hammond DPM48 drum machine, £75. Wanted Cheetah MS6

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**ROLAND JUNO 60** excellent condition analogue synth, £300 ▫ 0171 431 6236

**ROLAND JUNO 106** excellent condition with manual, £400 ▫ Graham 01206 827879

**ROLAND JUNO 6**, Performance Plus, Elgam organ, 80's Strat, Marshall JCM800, GS6, RE201, DM1000 swap for VS-880 or call for best cash package deal ▫ Ian 01539 723631

**ROLAND JUNO 6** Performance + RE201 Space-Echo fender strat, JCM800 GS6, DM1000 Elgam swap/pv, VS880, DMT8 V2, Roland JV1080, Korg Wavestation AD/EX, Akai MPC60 II. ▫ Ian 01539 723631 After 6pm

**ROLAND JV880** excellent condition with manual £450; Tascam MM1 20 channel midi mute, excellent condition, manual £399 Home use only, invoices available ▫ Pascal 0181 3681877

**ROLAND JV1080** synth module, absolutely immaculate, manual, boxed, £899 ono, Akai S1100 digital sampler, 18Mb RAM, SCSI, SMPTE boards, effects, immaculate, manual, boxed, £1600 ono. ▫ 01384 410853

**ROLAND JX3P** plus PG200 programmer, £500, good condition. ▫ Paul 0956 656532

**ROLAND JX8P** synthesizer with PG800 programmer, memory cartridge and flight case, all mint, £545 ono. ▫ 01527 875384 (Bromsgrove)

**ROLAND MK570** Super JX module with PG 800 programmer, 3 ROM, 1 RAM cartridges, boxed, manuals, excellent condition, £695, Korg Monopoly, boxed, manuals, immaculate condition, fully working, £350. ▫ 0191 537 4817.

**ROLAND MC303** Yamaha CSI X offers or swap for blue Quasimidi Raven. ▫ S Davies 01685 873405 ext 183, 01685 872025 after 6pm

**ROLAND MC303** brand new, Yamaha SY85, mint, sample disks inc TR909, TB303, swap for Ensoniq ASR10 sampler, keyboard or rack. ▫ Rob 0191 4422650 after 6pm (Newcastle)

**ROLAND SC55** Sound Canvas, boxed as new, £320. ▫ 01372 741185

**ROLAND RD300** digital piano, £900 inc flightcase, stand, Korg 01W/FD, £900 with stand, MC300 Super MRC, £220, Alexis SR16, £150, BC1, £15. Exchange wind synth/module. ▫ 01245 442864

**ROLAND SC33** Ssound module, good condition, £190, Boss distortion, £20, guitar, old, £15. ▫ Tim 0151 280 6693

**ROLAND SC55**, £250, Casio CT101, £100, Yamaha FB01, £75 All home use only, all with manuals. ▫ 01706 351840

**ROLAND SH5**, £600, Juno 106, £400; SH101 red & grip, £300, SHY11 blue, with grip, £300, SH101, grey, £225, HS10 (Juno 1), £150. ▫ 01274 620004 (Bradford)

**ROLAND SH101**, £250 mint; Prophet T8, £2900, Roland SH1, £270, Juno 1, £250, CR68, £150, Korg KPR77, £125, Octave Kat, £295, Roland TR606, £150 mint, TR808, £495. Others available. ▫ 01372 745494

**ROLAND U20** keyboard, flight case, scissor stand and expression pedal also available, £400. ▫ 01420 476994

**ROLAND U20** custom built flight case, vgc, but hairline cracks on a few keys in top octave hence, £325 ono. ▫ Richard 0181 366 4108

**STUDIO ELECTRONICS SE1** Minimoog in a rack with memories £1000; Nordlead rack as new £850, Kurzweil K2500 rack, 500MRG drive + sample option, 32 MEG sample RAM as new £3000. ▫ 0121 351 4011

**TECHNICS WSA-1** pro workstation, 32 track sequencer, 32-part multitrack, 64voice - polyphony reviewed in SOS December 95, 6 months old, A1 condition, £1200 or exchange for Yamaha ProMix 01 digital mixer. ▫ 0171 720 3702

**WURLITZER ELECTRIC PIANO**, £150, Korg Lambda analogue poly synth, £99, ETI 2000 analogue mono synth, £60. ▫ 01234 852588

**YAMAHA CBTX3 MODULE** £65, Intel override pentium processor for 486 system, £65, Canon BJ10 inkjet printer £65. ▫ Ged 01925 291805 (Office hours)

**YAMAHA CVP30** digital piano, 88 weighted keys, MIDI connections, perfect condition, £1250 ono. Buyer collects. ▫ 01493 843221 (Grt Yarmouth)

**YAMAHA DX5** with five sound

cartridges, £750, Bit 01 synth module, £200, Yamaha TX81Z synth module, £175. ▫ Andy 0181 883 4871

**YAMAHA SY35** vector synth, perfect condition with manuals, etc., £280. ▫ Rob 01705 690842 (Portsmouth)

**YAMAHA SY55** synth, onboard sequencer plus one expansion card, £300 ono. ▫ Mike 0181 325 0692

**YAMAHA SY77** with stand, manuals, home use only, £500, Akai S01 sampler, £350, Boss MX10 line mixer, £90. ▫ Matt 0113 262 8986, Flat 11C, weekdays, 01484 686658 weekdays.

**YAMAHA SY85** immaculate condition complete with full flightcase stand and manuals, offers. ▫ 0151 280 7523

**YAMAHA SY85** 2.5mb sample RAM, Ambient and Techno sound disk, all manuals and leads, £600 ono. ▫ Matt 01225 891570 (Bath)

**YAMAHA SY85** boxed as new, £700. ▫ 01372 741185

**YAMAHA TX216** module, two DX7s in module form, double the polyphony, in excellent condition, home use only, with manual, now very rare, £200. ▫ 01493 603614 (Norfolk)

**YAMAHA TX81Z** 1u rack mounting synth module, good condition, £175. ▫ Dave 01386 553560 (Worcs)

**YAMAHA TX81Z** Sound module, £100, Roland MV30 sound module and 16-track sequencer, £275, Yamaha REX50 effects unit, £75. ▫ 0181 655 4420

## RECORDING

**ACES MIXER** 24-buss, 48 inputs, 5 band EQ, 5 auxiliaries, LED bargraph meters on inputs, 26 VU meters, modular, integral patchbay, bargain, £1000. Consider PX or swap for effects units, guitars. ▫ 01482 448767

**AHB SR242** bit crackle, but good solid deck. £450 bargain, Roland RS202 string synth, case cracked hence, £80, Kawai R50 drum machine with extra chip, £120. ▫ Jon 0181 203 6085

**ALESIS 3630 COMPRESSOR** £150, Alexis microphone III £80, JLCooper PPS 100 timecode £100, Studiomaster 8 2 mixer £200; Tascam 4 track portastudio £150, Beyerdynamic TGX480 mic £150. ▫ 01426 606054

**ALESIS ADAT V3** 06, 175 hrs use only, excellent condition, £1350, Soundcraft Spirit PacPac mixer, £395, Sansui MX12 mixer, £125, Casio CT1000 synth and CSM10P piano module, £130. ▫ 01494 674424

**ALESIS ADAT V4**, only 2 hours on record head, comes with remote, £1295. ▫ 0181 452 4764

**ALLEN & HEATH SABRE 24** 16 buss, MIDI muting, 4 band EQ, 6 aux sends, 44 inputs on middown, modular, £3400, Tascam 38 with two DX4D noise reduction, £875; Emax with disks, £600. ▫ 01923 231866

**AMPX RECORDING TAPE** 1 inch, 10 5-inch alloy spools, professional 797 wideband oxide coating, three unwrapped, three erased, free bulk eraser with full purchase, £20 each. ▫ 01305 832387

**APHEX AURAL EXCITER C2** with Big Bottom, excellent condition, with manual, £180 no offers. ▫ William 01623 843366 (Notts)

**CAMBRIDGE AUDIO R50** monitors, good condition, home use from new, teak cabinets, offers invited. ▫ Keith 01969 663678 (Wensleydale)

**DIGITECH STUDIO VOCALIST** still in box from new, £750; Gibson Epiphone Strat shape with three hotrail pickups in, £150. ▫ 0114 2882236

**DYNAUDIO BM15 MONITORS** mint condition, only 2 months old, boxed and guaranteed. Cost new £1000 sell for £795. ▫ Matt 01233 623660

**FOSTEX DCM100** MIDI 8-track stereo mixer and Mixtab, mint, boxed, instructions, unused, £195, Torque T30 amplifier, excellent condition, £45. ▫ Lucy 01246 558481

**FOSTEX DCM100 & MIXTAB** programmable 8-channel MIDI mixer, £400 ono. ▫ 01993 812739

**FOSTEX DMT8** boxed, manuals, excellent, £950, ART Multiverb XT, boxed, manuals, excellent, £250; Samson Q5 headphone amplifier, boxed, manual, excellent, £125. ▫ 01420 84030

**FOSTEX DMT8**, £1000, Seck 18 8 2 mixer, £500, Peavey speakers Hi Sys 2, £500. ▫ 01206 573677

**FOSTEX E16** with rackmount kit,

excellent condition, home use, £1450 ono; Alexis Microverb II, £120; Alexis Midverb II, £210. ▫ 01483 277078

**FOSTEX 450**, £475; Ibanez HD1000, £120, Kawai R100, £175; Studiomaster Sessionmix 16:2, £320; Atan 1040 ST medium res monitor, £160; Crown/Amcron MT2400 600W X2, £525; 4 x 30 pin SIMMS, £32. ▫ 0121 622 2743

**FOSTEX 4010** timecode generator and reader, ideal companion for Fostex 4030 synchroniser, excellent condition boxed with manual, £250. ▫ 0171 793 7376

**FOSTEX E16**, £1000; Allen & Heath Saber desk, 44 channels 16-buss, six aux sends, bar graph display, very smart clean desk with patch bays, £4000. ▫ 01753 643886

**FOSTEX G16** plus SMPTE and loom, home use only, very good condition, only 4 tapes used in 3 years., £1750 ono. ▫ Steve 01908 319771

**FOSTEX M80** professional 8-track reel to reel recorder includes manual, looms and demagnetiser, £500 would exchange for a good sound module or effect unit. ▫ 0171 7203702

**FOSTEX M80** pro reel to reel 8-track recorder in very good condition with 3m loom cable and demagnetiser, £510 ono. Part exchange welcome. ▫ Dado 0171 720 3702

**FOSTEX MTC1**, £140; Yamaha GC2020 dual compressor, £145; Alexis XT:c digital reverb, £140; Gibson Epiphone EM2 Rebel electric guitar, two humbuckers, single coil blue/gold, £210 all mint. ▫ 01295 721696

**FOSTEX R8** in excellent condition, with loom and five spare reels, hardly used, £750 ono. ▫ 01227 471684 pm

**INKEL MIXER 8:2** inc two stereo channels, inputs for mic, line, video, CD, record deck, PFL, aux, headphone socket, EQ, meters, £70 ono. ▫ 01763 838722

**KORG G4** Leslie simulator £200; Fender rhodes stage 88+ amp/cab £650; Roland HP3800 digital piano £1550; Kawai mp-16 midi mixer £200. ▫ John 0115 924 2088

**LA AUDIO 4G QUAD** noise gate, £150 ono. ▫ Eddie 01482 897307

**LEXICON LXPI REVERB**, £275; LRC remote control, £250, AKG 6-way phantom power unit, £100; Roland CR78 Compunhythm, £200; HH TPA25 x 2, £50; Yamaha E1010 delay, £40. ▫ 01904 653518

**MACKIE CR1604** home use only, vgc, professional spec, budget price, £600 ono.; Studiomaster Diamond Club 16:2, vgc, boxed, manuals, home use, £300. ▫ 0385 960022

**MACKIE CR1604** mixer, boxed as new, £625, Tannoy system 2 monitors, boxed, £195; Atari 1040ST, £175; Teac A3440 4-track, £275; Steinberg Timeclock SMPTE, £100; Ashley compressor, £100. ▫ 01507 480509

**PHILLIPS DCC170** digital recorder, boxed as new, includes nine tapes and spare battery, cost £300, asking £200. ▫ Richard 01227 742555 (Kent)

**PHILIPS DCC730** stereo digital cassette recorder, excellent condition with manual & remote control etc, £180. ▫ 01933 678608

**PHILIPS DCCV730** 18-bit digital compact cassette recorder, with cassettes and remote, perfect condition only, £175. ▫ 01772 732647

**SAMSON MPL1502** stereo line mixer, 15 inputs, six months old with manual, excellent condition, £175. ▫ Graeme 0161 797 4305

**SECK 18:8:2 MKII** mixing desk, vgc, home use only, £500. ▫ 0151 526 2178

**SECK 18:8:2** in-line desk, 3-band EQ with mid sweep, 5 aux sends, 4 aux returns, sub-group inserts, channel inserts, loads of features, £500. ▫ Charlie 01422 883374 (Halifax)

**SECK 18:8:2** mixer with flight case plus stage box, 25m balanced multicore cable £975, Roland MC50 £350; Alexis MEQ230 EQ £125; H8B 3 way stereo crossover £70. ▫ Bob 01325 284206

**SIMMONS SPM8:2** MIDI programmable 8-channel, 1u, rackmount mixer, two effects sends, 3-band parametric EQ, boxed, manual, £150. ▫ 01732 871570

**SONY D8 DAT** portable recorder, variable sampling rates, 48/44.1/32Mhz, gold connectors, etc, replaces the D7, brand new un-used, cost £600, accept £400 ono. ▫ 0881 834313

**SONY DTC60ES** DAT recorder,

44.1kHz, analogue input, digital input and output, boxed as new, £450. ▫ Andy 0171 681 0519, 0585 507569

**SOUNDCRAFT 8-TRACK** reel to reel, Bel 8-track noise reduction; Studiomaster 16:8 2 desk and loom, £950, ono, will split. ▫ 01255 880480

**SOUNDCRAFT SPIRIT FOLIO4** excellent condition, £900 ono. ▫ Nick 0976 826503

**SOUNDCRAFT STUDIO AUTO 32:8:2** mixer, MIDI mute, excellent condition, £1950; DAT player Technics SC DA10, silver full size infra red remote, £320. ▫ 0117 923 7620 (Bristol)

**STUDIOMASTER DIAMOND** 12:2 mixer, boxed, manual as new, £230; Yamaha TG100 sound module, PC interface editing software, boxed, manuals, £150, home use only. ▫ 01737 557792

**STUDIOMASTER MIXDOWN** 16:8:16:2 desk, £750; Tascam T5R8 half-inch 8-track, no head wear, home use only, £1250. ▫ Brian 01476 860490

**STUDIOMASTER MIXDOWN GOLD** 16:2 mixer recently serviced, flightcase, £450 ono; Moog Rogue, ex cond, boxed with manuals, £150. ▫ Kris 0151 523 8110 after 6pm

**SYMMETRIX 501** compressors, £199 each, Alexis SR16, £120, Alexis Midverb 4, £199, Yamaha RY8, £100; Akai S3000, 8Mb, £250, Studiomaster Diamond 16:2, £250. ▫ 0121 422 9605

**TANNOY PBM 6.5** Mk2 monitor speakers, very pleasant clear, smooth, substantial, sound with strong bass and imaging, as new, boxed, £180. ▫ 0161 861 7261 (Manchester)

**TASCAM 38** half-inch, 8-track, including 8 channels dbx, £750; Yamaha FX500 guitar effects, £130; A-frame keyboard stand, £90. ▫ John 0115 9142850

**TASCAM 238** recorder, £350 ono; Fostex 812 desk, £350 ono, mint condition very little use. ▫ Mark 01424 242130 (Hastings)

**TASCAM 238** heads OK, transport not, for spares, offers. ▫ 01243 377427

**TASCAM 424 MK2** Portastudio, plus extras, excellent condition, £425 ono; Digitech TSR12 multieffects processor, studio reverb, still boxed as new, £225 ono. ▫ 01634 379261

**TASCAM 424** Portastudio, boxed with manual, as new, £350. ▫ 0181 641 6210

**TASCAM 488**, vgc just serviced., must sell, £575 ono. ▫ 01843 862072. vgc, boxed, manuals, home use, £300.

**TASCAM MSR24** 24-track with remote control, multicores, test tape, 15 tapes and demagnetiser, £3000; Tascam M2516, 16 channel, 8 buss mixer, £800 both excellent condition. ▫ Bob 0131 229 3588

**XRI 300** SMPTE unit, supports all formats including drop frame, MTC, upgraded, two ins merged, three outs, £1000 no. ▫ Stuart 01949 850329

**YAMAHA MT120S** 4-track, mint, boxed, manuals, hardly used and very well kept, dbx, 4 tracks simultaneous recording, graphic EQ, twin speed, £195. ▫ Dave 0191 372 2621 (Durham)

**YAMAHA MT120 MKII** 4-track portastudio, dbx, graphic EQ, effects send/return, dual speed, hardly used, boxed, manual, £180. ▫ 01732 871570

**YAMAHA REV7** mint, £450; Zoom 9120, mint, £225; Sony pro reverb, £550; Yamaha DX7, £425; Korg M1, £550; Kurzweil Micropiano, £325; Quadreverba+, £195; Roland TR626, £125. ▫ 0131 552 4668

**YAMAHA SPX90II** multi effect processor pro reverbs, £190; Digitech GSP 21 pro with foot controller, mint, £350; Tascam Porta One Ministudio, hardly used, £190, all with manuals the lot. £600. ▫ 0121 427 5754

**YAMAHA PROMIX 01** programmable digital automated mixer for sale, boxed with manual, read the rave reviews then buy mine, home used only, £1200 cost, £2000. ▫ Julian 0115 981 0316

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**AKAI S950** fully expanded, £635; Yamaha SY22 vector synth, £205; Atari1040STE, SM124 hi-res monitor, £200; Sansui WSX1 6-track recorder, 8-channel stereo mixer, £325. ▫ Tom 01734 546192

**AKAI S950** fully expanded, boxed with manuals, home use!, £550; Alexis Midverb III, £80; Alexis D4 drums, £180; Roland Octapad, offers. ▫ Paul 0151 785 3761

**AKAI S1000** classic sampler, 2Mb, manual, V4.3 and V3 software plus loads of classic sample disks for dance music, £1100 ovo. ▫ James 01923 269695

**AKAI S950 2.5MB UPGRADE** disks, manual, home use only, vgc, £650; Korg D551 sampling synth sound library, £325. ▫ 0385 960022 (Essex)

**AKAI S950** Expanded, boxed with manuals, £700. ▫ Mat 01691 831427

**AKAI S1000** 26Mb, digital I/O, excellent condition, home use only, £1350. ▫ Gordon 01225 761360

**AKAI S1000 SAMPLER** 10Mb inc two sample CDs hardly used, immaculate, boxed, £1150 ono. Wanted 53000 8Mb boards urgently. ▫ Andy 01482 448674

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**CASIO FZ1** keyboard sampler, manuals, disks, £600 ono; Roland SH09 analogue synth, £195 ono; Casio CSM1 expander, drums, sound effects, £190 ono. All home use only. ▫ Paul 01203 325685

**CASIO FZ10M** sampler, excellent condition, large useful library, manuals, additional software, must sell, bargain at, £495. ▫ 01633 880946

**CHEETAH SX16** sampler 16-bit stereo inputs 3 outputs reads Akai disks, excellent condition with manual V.3.0 software and library, £300. ▫ Simon 0161 737 4483 eyes

**CHEETAH SX16** 16-bit, eight outs, many discs, boxed manual, £300 ono.; Akai X7000 with expansion, VGC, £200 ono; Roland D10 synth, £300. ▫ 01273 710021

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**ENSONIQ EPS16+** sampling keyboard, 24-bit effects with OEX6 output expander, £750; Oscar, rare classic analogue synth, £750; Roland TB303, £650. ▫ Tony 01455 614989 (Leicester)

**EMU ES132** 8MB RAM, SCSI, still under guarantee, boxed, manual, £1000. ▫ 0181 889 5144 or 0976 304177

**PEAVEY DPM SP/SXII** 8Mb, SCB, 44Mb Sysquest, and 3 cartridges, SCS 4U case, £800, QY10, £100. ▫ 0131 621 2196

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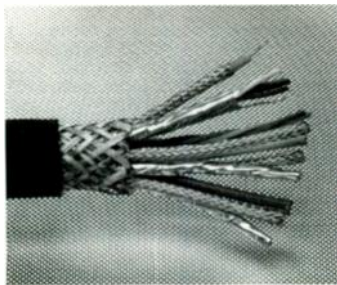
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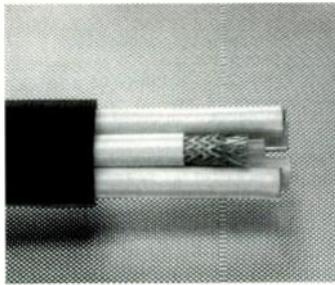
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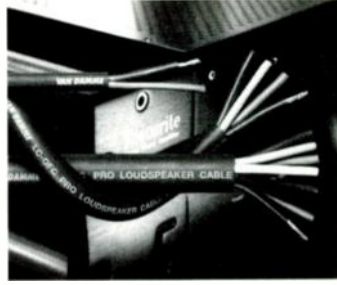
*Van Damme camera cable*



*5 way video multi*



*Van Damme black series  
tour grade multi*



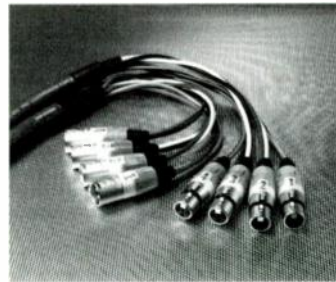
*Van Damme speaker  
cables*



*Educational books*



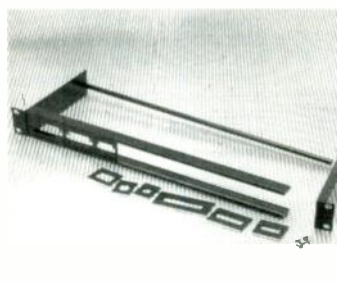
*New Neutrik mains  
connector*



*Loudspeaker looms*



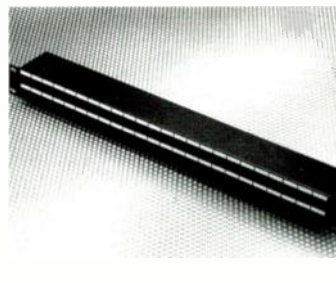
*Ceeform assemblies*



*Hexadec system*



*Van Damme triaxial cable*



*Rean 'A' gauge patch bay*



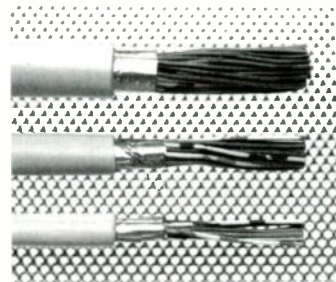
*Rean Bantam patch bay*



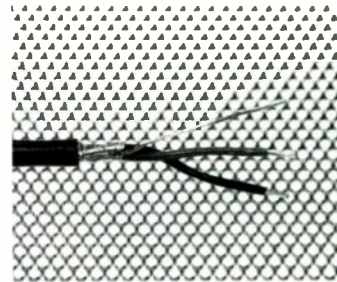
*Triaxial connectors*



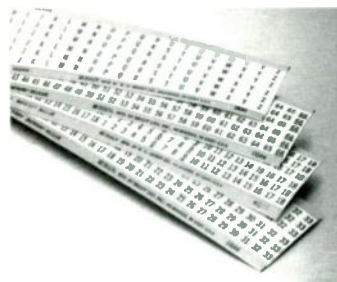
*Gaffer tape*



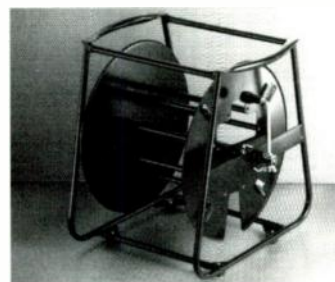
*PSN equipment cables*



*LSOH 1 pair cable*



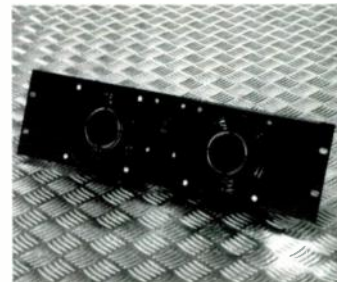
*Brady markers*



*Hanser drums*



*Data cable assemblies*



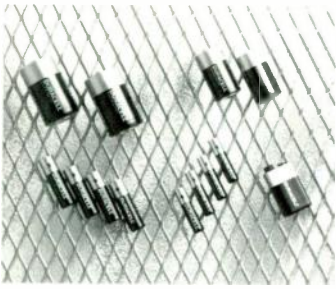
*Vertical fan panel*

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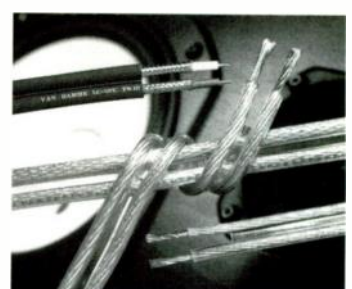
**Batteries**



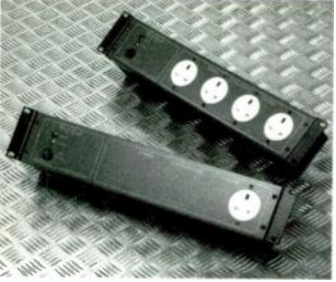
**Mag-lites**



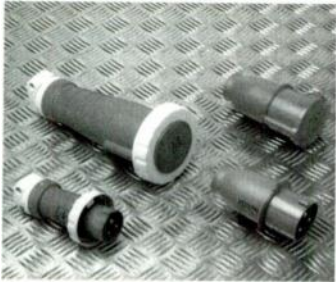
**Magnetic tapes**



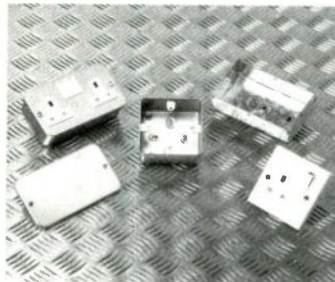
**Van Damme hi-fi cables**



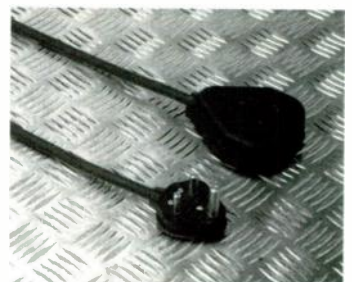
**EMO distros**



**Ceeform connectors**



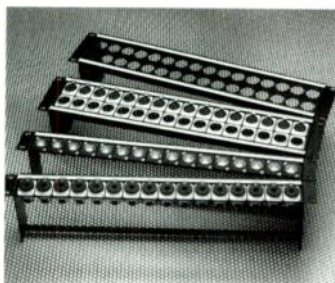
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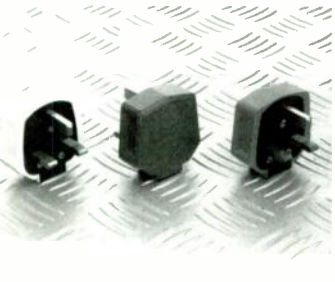
**XLR patch panels**



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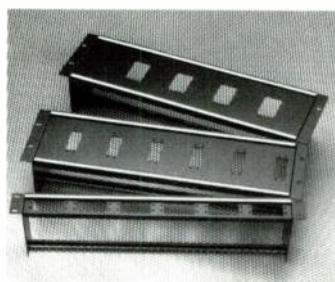
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**APPLE MAC HD SYSTEM** Audiomedia II, Emagic Logic Audio 2.6, Digidesign Pro Tools, DAE software, 40Mb RAM, Micropolis 1GB drive, £2250. ✦ Andy 0171 681 0519, 0585 507569.

**APPLE MAC QUADRA 650** 8/160 Colour monitor, extended keyboard, cubase audio, audio media II, finale, 1 gig micropolis separate hard drive SY55, very good condition. ✦ Toby 0973 672997 day 0171 834 8964 evenings.

**APPLE PERFORMANCE 5200** 12/500, mint cond., £900; Opcode Studio 4 MIDI/SMPTE, £250; C-Lab User plus Export, £80. ✦ 0161 409066 or 0976 683953

**ATARI MEGA ST4** + 60MB Hard disk + SM125 monitor. Excellent for beginners to sequencing, £450. ✦ James 0191 4105254 (Newcastle)

**ATARI FALCON 14MB** RAM, 350MB internal IDE, £799; Cubase Audio 16, £499; FDI digital I/O, £150; External SCSI2 hard drive 540Mb, £199, or the lot for, £1450. ✦ 01702 616961.

**ATARI FALCON D30** 4MB, 127Mb, hard disk, with SVGA monitor, £450. ✦ 01509 507188 (Emildlands).

**ATARI FALCON 14MB** RAM, Cubase Audio 16, FDI digital interface, external SCSI drive, ideal 16-track recording package, £1000 the lot. ✦ 0956 656555.

**ATARI HI-RES MONITOR** BW display with sound, suitable for Cubase and Notator programs, £85. ✦ 0181 668 6077.

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**ATARI STFM** with memory board fitted, all kinds of hardware and software, mags etc. Samplers, sequencers, midi utilities and keyboard, colour monitor, mono emulator. ✦ 01480 406415 (after 7pm)

**ATARI 520STFM** including ST Replay sound sampler and Music Studio MIDI sequencer, £100 ono. ✦ 01937 580000 (nr Leeds).

**ATARI 1040STE** and 146 hi-res monitor, loads of software, mint condition, £190. ✦ Jim 01115 955 5826.

**ATARI 1040STE 2** Mb, SM124 monitor, Foxtek R8 with MTCL and software, and manuals, all for £1000; DCC170, £190. ✦ Tony 01427 614135 after 7pm.

**ATARI 1040STE** 4mb hi res monitor, mouse, manuals, games boxed as new, screen filter, all leads, £350. ✦ 0385 960022 (Essex)

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**CAKEWALK PRO** for Windows 3.0, complete with manuals, bought in error for education, £95 ono. ✦ Jon Haughton 01703 594913, email jah@svr.soton.ac.uk

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**EMAGIC LOGIC AUDIO 2.5** PC unregistered as new, £250, Korg D5S1

sampler vgc, £275; pair Tannoy DC2000 speakers vgc, £165, all ono. ✦ Tim 01545 590413.

**EMAGIC LOGIC V2.0** for Atari, manual, dogle, as new condition, £200 ono. ✦ 01454 326509

**EMAGIC LOGIC AUDIO V2.5** for PC, unopened £320; JL Cooper MSB Rev2 8x8 MIDI patchbay, £140; Yamaha RX21L drum machine, £40; Akai XEB drums £110; Casio CZ1 £300; Kawai K1m, £180; Peavy PA Speakers £150 All ono. ✦ Nick 01548 531334.

**FINALE V3.5** for Windows, complete with manuals, bought in error for education, £150 ono. ✦ Jon Haughton 01703 594913, email jah@svr.soton.ac.uk

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**STEINBERG CUBASE AUDIO** and Cakewalk Pro Audio, unemployment forces sale, less than 1 year old, MQX32, all for PC offers. ✦ Paul 01302 538304, 6pm.

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**ALESIS MMT8** hardware MIDI sequencer, with manual, PSU and original box, great condition, great sequencer, very immediate and easy to use, £125. ✦ 01843 587098.

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**YAMAHA QY20** portable workstation, MIDI sound module sequencer and mini keyboard, boxed c/w accessories, £225; Serving multimedia pc sequencer, £25;

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**ALESIS SR16** boxed, manuals, footswitches, excellent, £150. ✦ 01420 84030.

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**SEQUENTIAL STUDIO 440** manuals, £695; Roland TR909 manuals, £950; Sequential Circuits Drumtrax manual, £175; Roland OP8, £50; M64c, £30; Roland CMU800, £95; M16c, £15. ✦ 0181 300 1857.

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**YAMAHA RM50** rhythm sound module with sampling expansion board, boxed, manuals as new, £350; Roland R5, boxed, manuals, PSU, as new, £150. ✦ 0191 537 4817.

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.....**ROLAND PG1000** programmer for D50, immaculate boxed, £190; Yamaha DX7 100s sounds ROM RAM disks, £220 ono; Prophecy modern models and analogue vintage gear, £25. ✦ 01255 431288.

**STUDIOMASTER 700D** Power amp, perfect, boxed, manual, £350; Samson MPL1502 mixer, £180; Beyer S150 wireless guitar system, £120 All excellent other odds & ends too. ✦ 01420 840300.

**TRACE ELLIOT GP12** SMX rack amp 350 watt, 4x10 (with horn), 1x15 cabs. Eight months old vgc. £1450 ono. ✦ 01234 272919.

**VOX/BRANDONI 12-STRING** teardrop, black, mother of pearl scratch plate, original 60's tremelo, protective rear cushion, gorgeous sound, stunning looks, flight case, rare, reluctant sale., £750 ono. ✦ Steve 0121 6892386.

**WESTONE THUNDER** 6 string, £120; bass cabinet 400w 15" & 10" speakers, £100; NJD MP820 MIDI lighting unit, £150; Yamaha QX21 sequencer, £50. ✦ Bob 01325 284206.

**XR400 MIDI MATE** 3 way merge, 11 thru port and auto routing, as new with manual, £95 will deliver. ✦ Stephen 01246 410799.

## PERSONNEL

**A+R AGENCY** representing a wide range of dance labels, requires artists with good quality demos, all dance/electronic genres send: Fu-phonic, PO-Box 10503, London, N22 6TQ, England, Inc SAE.

**ENGINEER/PROGRAMMER** needed to work on Asian/Western remixes two days per week. Cubase, ADAT and keyboard knowledge essential. ✦ Jason 0171 701 7965.

**ESTABLISHED RECORD COMPANY** looking to license hard house/techno artists in UK. Overseas labels/artists should send tracks/test pressings to A+R Dept, PO BOX 7612, London, NW6 6FH, England.

**PRODUCTION COLLABORATOR** WANTED possessing sampler, drum programming, production, engineering expertise by talented young songwriter/composer/keyboardist with home studio. Into jazz fusion/R&B/psop/TV work. ✦ Al 0181 8740308.

**SICK OF THE ARROGANCE** of record labels? "The courtesy of a reply" isn't in their vocabulary, though your music deserves to be out there. ✦ Allstair 0468 570295 I have a plan!!

**TRANSMISSION RECORDS** requires

innovative trance/techno artists. Submit your demo+ info to Trancemission Records, PO box 4314 6202 VA Maastricht The Netherlands (Please enclose international reply coupon for sure reply)

**TROPOSPHERIC RECORDS** require demos for compilation release, ambient, trance, electro dub house, anything interesting considered. All tapes replied to send to RoseBank No 3 Eye Lane, Euston, Herefordshire HR6 0DU.

**TRULY TASTY RECORDINGS LTD** Require House, trance, left field, techno demos. T T A&R, 20 Rennies Court, Aberdeen, AB11 6NZ

## WANTED

**AKAI MPC60 MKII** drum machine wanted, cash waiting. ✦ 0181 883 4329 or 0956 339577.

**ANALOGUE GEAR REQUIRED** TR606, TR707, TR727, £75; SH101, MC202, Wasp, £150; TR808, £300; TB303, £425; Oscar, Jupiter 6, £500; TR909, Jupiter 8, £600. Faulty items considered. ✦ Kevin 01353 663613.

**ANALOGUE SYNTHS** Polymoog, Moog Source, Kitten, Cat, Oscar, Wasp, Gnat, ARP, AXXE, Odyssey 2600, Elka X705, Concertmate MG1, SH05, SH07, SH09, CR78, TB303 or anything interesting. ✦ 01942 814818.

**ANALOGUE SYNTH** rack mount Eventide phaser 1910 Harmoniser, any condition, Simmons Claptrap, Boss EH2/DC2 pedals, X-OR for Mac. ✦ 0181 692 8129.

**BOSS SE70** effects; Roland JV1080 module, cash waiting. ✦ Tom 0161 860 5028.

**BOSS SE70** or SX700, offers? Cash waiting, similar FX (Derbyshire). ✦ Michael 01629 813259 (Canbyshire).

**BSS DPR502** noise gate wanted, cash waiting. ✦ 0181 883 4329 or 0956 339577.

**ENSONIQ TS12** will travel to collect, more paid if fitted with SCSI or extra RAM. ✦ Sam 0161 728 5154.

**EVENTIDE H3000** SE/B wanted urgently also 70s and 80s Studio mags. ✦ 0171 625 5187.

**JUNO 60 MANUAL** Akai S700 manual, Alesis rack mount for three micro effects units, D110 PC Librarian and sounds. Cash or exchange for CD's. ✦ Steve 0171 4856831.

**KORG WAVESTATION A/D** wanted. Can pay £700 cash and collect. ✦ Ian 01432 269494 (Hereford).

**KORG IIV VOCAL HARMONISER** cash waiting. ✦ Paul 01723 351732.

**MONO SYNTH** Jen SX1000; Teisco 110F, EDP Gnat, Firstman SQ01, Dewtron Gypsy, DGS Spider, Yamaha CS5, Logan vocalist, Wasp Deluxe, all must be good condition. ✦ 01243 830697.

**NOTATOR SL** for Atari. ✦ 01392 437435.

**QUARTER INCH JACK PATCHBAY** wanted, must be in good condition, could use four in total. ✦ 01482 448767.

**REMOTE CONTROL UNIT** for Teac X1000/R reel to reel tape machine. ✦ 01501 771895.

**ROLAND ROM/RAM CARD(S)** compatible with JV80 synth, especially piano/organ waves. Also internal ROM expansion board considered. ✦ Mark 0191 5849667 (Wearside).

**ROLAND S760 SAMPLER**, £900 ono for basic module, more if expanded; Mackie CR1604-VLZ Mixer, £650 ono; Bassstation rack, £275ish (or swap with keyboard version + some). ✦ Jason 01684 567607.

**WANTED ROLAND SH101** MC202, TB303, TR808, TR909, J106, JD800, J106, Atari ST/monitor, also Korg, Yamaha, Emu, Sequential equipmeny required. Anything considered for collector. No dealers. ✦ 01252 375025.

**WANTED ROLAND W30** Urgent!!! ✦ Enzo 01274 596275 (Bradford)

**SEQUENTIAL PRO ONE** circuit diagram wanted. ✦ Kris 0151 523 8110.



# EUROPE'S LOWEST PRICES GUARANTEED\*

## 2 Tracks



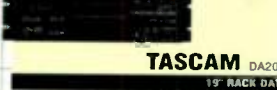
**SONY TCCD8**

**LIMITED STOCKS**

Turnkey bring you the first stocks of Sony's brand new portable, the TCCD8. Sturdily built with a back-lit display, the unit features 48 and 44 kHz recording. Initial supplies will be very limited, please now to reserve yours. The ultimate Walkman!

**RRP £599**  
**NEW BOXED**  
**£529**

## Mixers



**TASCAM DA20**

19" RACK DAT

If you need a 19" rack mount DAT machine, you don't come any cheaper than this! But that's not all: the expense of a quality machine, reliable tray-loading mechanism, the SCMS is reversible in or out. Both analog and digital recording at all 3 sample rates and coaxial S/PDIF in and out. High sound quality is guaranteed by 1-bit DAC playback. Special Table-of-Contents feature.

**RRP £299**  
**INC. S FREE**  
**90 min DATs**  
**£699**

## Mixers



**SOUND CRAFT SPIRIT STUDIO**

OUTSTANDING OFFER ON 16 OR 24 CHANNEL DESKS

Almost every mixer built in my 20+ years at some stage dreams of owning a Soundcraft console. The legendary sound quality, reliability and ease-of-use, means that a Soundcraft equipped studio must be taken seriously. The SPIRIT Studio represents a mixer miracle, produced in Britain, using the world's most advanced production technology and revolutionary manufacturing techniques to bring you Soundcraft quality at a previously unimaginable price.

**RRP £1499**  
**NEW BOXED**  
**£1189**

## Mixers



**SOUND CRAFT SPIRIT FOLIO MIXER**

BRAND NEW SPIRIT MIXER

The introduction of the new F1 sees the Williams team of mixer manufacturers in top gear! Features include 3 aux sends, 100mm faders, 3 band mid sweep EQ and insert points. Available in 14 or 16 channel versions.

**FROM**  
**£379**  
**NEW BOXED**

## Guitars



**YAMAHA PAC112**

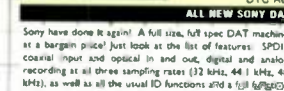
PAC 112 Pacifica

**LOWEST PRICE EVER**

The Yamaha PAC112 was voted Number One budget guitar for the past two years! Massive bulk purchase makes this unbelievable value for money. Order now to avoid disappointment.

**PRICE CRASH**  
**RRP £399**  
**£169**  
**NEW BOXED**

## Mixers



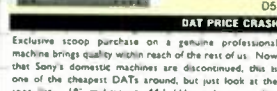
**SONY DTC AB**

**ALL NEW SONY DAT**

Sony have done it again! A full size, full spec DAT machine at a bargain price! Just look at the list of features: S/PDIF coax opt out and optical in and out digital and analog recording at all three sampling rates (32 kHz, 44.1 kHz, 48 kHz), as well as all the usual I/O functions and a full 600MHz infra red remote control. Sony's exclusive Super Bit Mapping process can also be switched in, cramming the sound of 20 bits into 16! Initial stocks are limited - get your order in now!

**RRP £699**  
**NEW BOXED**  
**£599**

## Mixers



**FOSTEX D5**

DAT PRICE CRASH

Exclusive supply purchase on a genuine professional machine brings quality within reach of the rest of us. Now that Sony's domestic machines are discontinued, this is one of the cheapest DATs around, but just look at the spec list: 19" rackmount, 44.1 kHz analog recording SCMS-free operation, error detection indicators, balanced I/Os and out on XLRs, AES/EBU professional digital connections as well as all the usual DAT features from the makers of the world's industry standard D208 2-tape deck machine. Huge reduction.

**RRP £1299**  
**INC. S FREE**  
**90 min DATs**  
**£799**

## Mixers



**SOUND CRAFT SPIRIT FOLIO NOTEPAD**

BUDGET PORTABLE MIXER

For quality mixing on a budget, this has to be the nearest solution around. Typical Soundcraft quality has been further enhanced by the use of surface mount technology and custom designed rotary pots. 4 mono inputs are provided along with 2 stereo, which also feature RMAA preamps for record deck connection, 3 band EQ and an auxiliary send complete a highly flexible package.

**RRP £199**  
**NEW BOXED**  
**£199**

## Mixers



**FOSTEX MIXTAB**

MIXTAB package

Brand new mixer from the superb Soundcraft.

**NEW PRODUCT**  
**£599**  
**NEW BOXED**

## Guitars



**MARSHALL DRP1**

DIRECT RECORDING PRE-AMP

The Marshall DRP1 makes getting a fantastic sound through any system a cinch. Now you can have Marshall tone straight through a PA, studio monitors or direct onto tape (it also makes a great headphone practice amp). Controls include pre-amp volume, gain boost, bass, middle and treble, master volume and line level. Features 48V output level, battery strength (unit can also be mains powered by a DC adaptor). These units are the last ever - incredible price!

**RRP £199**  
**NEW BOXED**  
**£49**

### NEW, USED & EX DEMO

Arbiter karate...	£49
Denon DCD315...	£619
Denon DCDA25...	£1199
Denon DCD715...	£234
Denon DNT708...	£539
Denon RMC...	£46
Fostex DJD...	£2676
Fostex PD120...	£999
Marantz PHD321...	£511
Marantz PHD507...	£799
Marantz PHD510...	£603
Panasonic DV700...	£1439
Philips DCC101...	£379
Philips DCC911...	£279.99
Revox 877...	£2499
Sony DTC1000ES...	£549
Sony DTC605...	£799
Sony DTC619...	£627

### NEW, USED & EX DEMO

Sony DTC730...	£499
Sony DTC6A...	£649
Sony DTC6B...	£649
Sony HDS302...	£479
Sony HDS2...	£219
Sony TCDD10 PRO...	£3379
Sony TCDD7...	£450.03
Sony WHD4C...	£349
Tascam 112MK2...	£399
Tascam 202MK2...	£349
Tascam CD401MKII...	£735
Tascam DA20...	£649
Tascam DA30P/KH...	£643
Tascam DA60...	£643
Tascam DA88...	£839
Tascam SYD4...	£504.08
TEAC V375...	£399
TEAC W416...	£99

### UNDER HALF PRICE

This has to be the best value mixer on the market! Fostex's DCM100 is a fully digital rechronize mixer with 8 stereo inputs, 2 aux sends, 2 band EQ, mixer, pan and level. An additional 2 stereo aux returns and a stereo master/slave output give a maximum of 22 inputs. This alone would be incredible value for money, but the MixTAB also gives hardware control of every function of the mixer via MIDI. The MixTAB can store up to 100 snapshots of all the parameters of the mixer, and multi-colour LEDs allow resetting of all the hardware controls to the current position. MIDI output from the faders can be recorded into any synthesizer giving totally automatic mixing and recall - come back to exactly the same mix weeks later! Cabinet and large menu also available. Under half price (Total RRP £779). Very limited quantities - last units ever!

**RRP £779**  
**NEW BOXED**  
**£249**

### UNDER HALF PRICE


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**RRP £779**  
**NEW BOXED**  
**£249**

### NEW, USED & EX DEMO

BOSS MD8...	£199
Crato G40CXL ZCHE199...	£199
Crato G40CXL ZCHE199...	£199
Crato G40CXL ZCHE199...	£199
Digitech RP10...	£48.08
Digitech RPS...	£67.99
Epiphone Les Paul...	£149
Fender 4X12 cab...	£149
Fender Jap Strat...	£399
Gibson ES135...	£1499
Gibson LP Classic...	£1499
Gibson LP EB...	£1099
Gibson LP Stew...	£1899
M + K Tubeman...	£1199
Marsfield Dr. Bass...	£239
Reuter 2408...	£169
Rickenbacker 360...	£749
Roland G10P...	£499
Roland GP100...	£739
Squire LSG 5SW AMP79...	£119
Squire Freq. Bass...	£199
Squire Strat...	£139
Trace Road 1X12	£129
Combo...	£349
Yamaha diversity sys	£99

## Electro Voice



**ELECTRO VOICE Sx2000**

300 watts

The latest incarnation of the classic Stage 200 full range PA speaker 300 RMS power handling in an incredibly compact design. It's 12" woofer plus wide dispersion horn. Built 7 band graphic and a built-in Basson Alex! Check out these amazing package deals!

Powerstation 2 x JBL MRB25... £1599  
Powerstation 2 x Paavey H142... £1549  
Powerstation 2 x Electrovoice 3200X... £1799  
Powerstation 2 x JBL M330... £1849  
Powerstation 2 x JBL 902 + 802C... £1999  
Add 4 SPS18s + stands, spider stands and cables for £499

**RRP £1379**  
**NEW BOXED**  
**POA**

## Multitracks



**TASCAM DA-38**

NEW 0 TRACK DIGITAL AUDIO RECORDER

The DA38 has become the industry standard digital MTR in professional film and audio recording. The new DA-38 looks set to hold on to this well featured that includes 16bit, a 64 oversampling A/D's, 20bit x 8 D/A's plus V-DR 24bit digital recording at 48 or 44.1 kHz. An internal electronic passkey allows any input to be routed to any track and output. Plus up to 16 DA-38 units can be connected together and with the optional MMC-38 allows for sequencer and timecode control.

**RRP £2999**  
**NEW BOXED**  
**£2499**

## Mixers



**AKAI DR-16**

INC. 16IG HB

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

**NEW DR 16**  
**£3699**  
**INC. 16IG HB**

### NEW, USED & EX DEMO

A&H G51...	£1056
Audio Logic SC101649...	£609
Behringer Eurodesk 47199...	£606
FOSYSX...	£406
FRONTLINE 82...	£299
Mackie 14...	£2075
Mackie 24...	£3590
Mackie 24E...	£1979
Mackie 32...	£3499
Mackie BRIDGE16...	£649
Mackie BRIDGE32...	£799
Mackie CR1202...	£349
Mackie CR1202V2...	£339
Mackie CR1404...	£495
Mackie LHM304...	£899
Mackie MBE...	£799
Mackie SC 8 SHOECASTER...	£649
Mackie SR124...	£1095
Mackie SR324...	£1999
MIDIPAN mini mixer 649...	£649
MIDI audio opt module 99...	£99
PHONIC 42...	£89
PHONIC BXX 8800...	£149
Samson M1122...	£249
Samson MIXPAD...	£199
Samson MPL 2342...	£749
Samson MPL1502...	£649
Samson MPL1490...	£449
Sndcr DC2000 24618790...	£249
Sndcr DC2000 32621130...	£249
Sndcr DC2000 326224057...	£249
Sndcr DC2000 326228429...	£249
Sndcr DC2000 326227600...	£249
Sndcr DM1500...	£882
Sndcr Folio 10-2 £380.02...	£382
Sndcr Folio 12-2 £445.58...	£445
Sndcr Folio 17-2R £444...	£444
Sndcr Folio 4 £1209.24...	£1209
Sndcr Folio LITE £190...	£190
Sndcr Folio SL £540.07...	£540
Sndcr Folio SIRACX £540...	£540
Sndcr Ghost16MB £528...	£528
Sndcr Ghost16ST £423...	£423
Sndcr Ghost24 £3425...	£3425
Sndcr Ghost24E £34425...	£34425
Sndcr Ghost24EXM £6375...	£6375
Sndcr LIVEX16 £143233...	£143233
Sndcr LIVEX24 £2093033...	£2093033
Sndcr LIVEX38 £688330...	£688330
Sndcr LIVEX38P £6740...	£6740
Sndcr PROtractor £683...	£683
Sndcr SpiritAuto £242579...	£242579
Sndcr SpiritAuto2 £236407...	£236407
Sndcr SPIRXC3 £2261...	£2261
Sndcr SPIRXC7 £2261...	£2261
Sndcr SPIRXC7A £2261...	£2261
Sndcr SPIRXC7B £2261...	£2261
Sndcr SPIRXC7C £2261...	£2261
Sndcr SPIRXC7D £2261...	£2261
Sndcr SPIRXC7E £2261...	£2261
Sndcr SPIRXC7F £2261...	£2261
Sndcr SPIRXC7G £2261...	£2261
Sndcr SPIRXC7H £2261...	£2261
Sndcr SPIRXC7I £2261...	£2261
Sndcr SPIRXC7J £2261...	£2261
Sndcr SPIRXC7K £2261...	£2261
Sndcr SPIRXC7L £2261...	£2261
Sndcr SPIRXC7M £2261...	£2261
Sndcr SPIRXC7N £2261...	£2261
Sndcr SPIRXC7O £2261...	£2261
Sndcr SPIRXC7P £2261...	£2261
Sndcr SPIRXC7Q £2261...	£2261
Sndcr SPIRXC7R £2261...	£2261
Sndcr SPIRXC7S £2261...	£2261
Sndcr SPIRXC7T £2261...	£2261
Sndcr SPIRXC7U £2261...	£2261
Sndcr SPIRXC7V £2261...	£2261
Sndcr SPIRXC7W £2261...	£2261
Sndcr SPIRXC7X £2261...	£2261
Sndcr SPIRXC7Y £2261...	£2261
Sndcr SPIRXC7Z £2261...	£2261

## GUITARS - 0171 379 6766

**D. J.**

**SOUNDLAB DPL3 & KAM GMX 250**

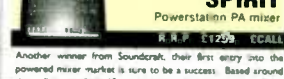
SPECIAL OFFER

Another early to use package for the budding DJ. The brand new GMX 250 mixer from KAM in combination with Soundlab's DPL3 is the ultimate bedroom package!

2 x Soundlab DPL3 1 x KAM GMX 250 2 x Sigmast 2 x Stanton Cart 1 x Maxell Headphones

**RRP £520**  
**£395**  
**INCLUDES FREE CABLES**

## Electro Voice



**SONY SPIRIT**


Powerstation PA mixer

Another winner from Soundcraft, their first entry into the powered mixer market is sure to be a success. Based around the well-known Folio 12, and also featuring a 2x300W amplifier, dual 7 band graphic and a built-in Basson Alex! Check out these amazing package deals!

Powerstation 2 x JBL MRB25... £1599  
Powerstation 2 x Paavey H142... £1549  
Powerstation 2 x Electrovoice 3200X... £1799  
Powerstation 2 x JBL M330... £1849  
Powerstation 2 x JBL 902 + 802C... £1999  
Add 4 SPS18s + stands, spider stands and cables for £499

**RRP £1295**  
**OCALL**

## Mixers



**XRI SYSTEMS**

XR3000 EXCLUSIVE

Long the synchroniser of choice in professional studios, we now exclusively bring you this industry standard unit at an unbeatable price. Features include true SHIFTE in all standard recording, MIDI clocks / Show Powers or MTC for compatibility with all MIDI sequencers. Large LED time-code display. Merged MIDI input. Straight-forward operating system. Full 19" rack unit.

**RRP £299**  
**NEW BOXED**  
**£159**

## Digital Mixers



**DIGITAL 8 TRACKS**

PRICE PRICES FROM

We will not be beaten on price or service. Akai, Fostex, Tascam, Sony and Alessi all in stock and on demonstration.

**£2195**  
**NEW BOXED**

### NEW, USED & EX DEMO

AKAI DR16...	£3999
AKAI DR40...	£899
AKAI DR8...	£2799
AKAI IB1100...	£1599
AKAI IB1115...	£159
AKAI IB12TV3.0...	£1799
AKAI IB13MV3.0...	£1819
Alessi ADAT...	£1799
Alessi ADATXT...	£199
Alessi A1...	£999
Alessi A12...	£1099
Alessi A12C...	£1050
EMU DAWWIN...	£2375
Fostex RD...	£699
Fostex RD8...	£3999
JLC DATAMASTER 669...	£699
JLC DATASYNC...	£349
Sony PCM800...	£3889
DR16...	£3999
AKAI DR40...	£899
AKAI DR8...	£2799
AKAI IB1100...	£1599
AKAI IB1115...	£159
AKAI IB12TV3.0...	£1799
AKAI IB13MV3.0...	£1819
Alessi ADAT...	£1799
Alessi ADATXT...	£199
Alessi A1...	£999
Alessi A12...	£1099
Alessi A12C...	£1050
EMU DAWWIN...	£2375
Fostex RD...	£699
Fostex RD8...	£3999
JLC DATAMASTER 669...	£699
JLC DATASYNC...	£349
Sony PCM800...	£3889

## TECHNICS



**TECHNICS SL-1200 MH2 / 1210**

MEGA DEAL

Sell the club standard after many years. SL1200s are still going strong. This incredibly low price includes a free Stanton cartridge. Package deals available with many more, please call to enquire.

**RRP £699**  
**£349**  
**INC. CART**

### NEW, USED & EX DEMO

Alessi MATICAS00 £499.99	Fender SRA300P... £469	
Alessi MATICAR00... £649	Fender SRA520P... £599	
Armstrong Powerbase 1 £249	Fender SRA520P... £734	
Base 502P... £1815	Fender SRA520P... £549	
Base 502P... £1815.63	JBL ESR1... £429	
Base 802C... £285	JBL ESR15... £999	
C Audio RA3001... £1218.48	JBL M330MKII EACH £703	
C Audio RA3001... £1239.5	JBL M330MKII EACH £821	
C Audio S1400... £703.83	JBL M330MKII EACH £743	
Dynamics DPA400... £199	JBL MR25... £480.32	
Dynamic Split Control... £119	JBL SRA715A... £1244	
EV S200X... £499	JBL SRA733A... £1526	
EV S200XEQ... £399	JBL SRA733A... £2032	
Fender 116ELC... £129	Paavey CS1000K... £799	
Fender 116ELC... £150	Paavey CS400K... £549	
Fender 116ELC... £174.83	Paavey CS800K... £649	
Fender 85120P... £810	Paavey EUROSPHM... £279	
Fender ESPSL3001... £139	Paavey EUROYSI... £180	
Fender ESPSL3002... £499	Paavey EUROYSI... £124.5	
Fender ESPSL3001... £539	Paavey EUROYSI1PHM294	
Fender ESPSL3002... £550	Paavey HS9p 32CT... £382.5	
Fender LX1504... £289	Paavey HIS75TKT... £549.5	
Fender LX1506... £349	Sabine FBX 1001... £1532.8	
Fender MX3200... £346.4	Sabine FBX 101... £669.75	
Fender MX3216... £1800.08	Sabine FL 610... £3248.7	
Fender PHK2321... £2348.83	Sabine SP 610... £3845.7	
Fender PHK2322... £2995.08	Sarran SS4... £549	
Fender PHK241... £374.83	Sarran SS4... £549	
Fender PHK241... £468.83	Soundcraft PL250M... £129	
Fender PHK241... £1232.58	Sonnet Dmnd PRO1623...	£163
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## Mixers




**FOSTEX D80**

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The D80 is a 3U rackmount unit, with 8 individual inputs and 8 outputs. It includes a 16bit, 48kHz A/D converter, a removable 850 meg hard drive. Stacks to 8 units with a S/PDIF digital in and out to allow backup to a standard DAT machine and direct digital recording. Easy to use editing allows cut, copy and repeat passing across multiple tracks.

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## Mixers



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

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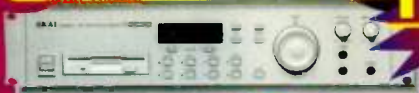


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Yes it's true. Dawsons Music are now on the World Wide Web, surfing it with the best of them. You will find an up to date 2nd hand list, details of new products, information request forms, finance forms for you to fill in, software updates for the popular sequencers, midi files for you to download as well as a competition. Link up to [www.dawsonsmusic.demon.co.uk](http://www.dawsonsmusic.demon.co.uk).



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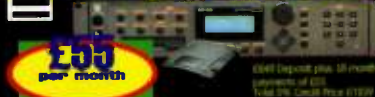


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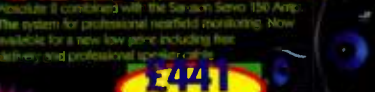
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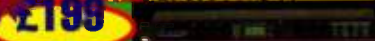
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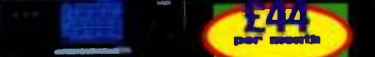
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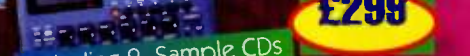
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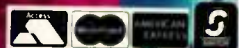
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SPECIAL READER OFFER!

# Anatek Pocket Products to solve your MIDI headaches!

At SOS, we have regularly found ourselves referring readers to one or other of the Anatek Pocket range of MIDI accessories to solve their all too common MIDI interconnection and transmission problems. Trouble was, Pocket Products were previously hard to find... until now!



## POCKET SYNC

- 'Smart' FSK Tape-to-MIDI synchroniser • Starts anywhere in song • MIDI In to Out merging • Automatic read/write switching • 'Jam Sync' protects against tape dropouts • Records tempo changes • MIDI and FSK status LEDs

POCKET SYNC is the way to expand the capabilities of any multitrack studio. No longer is it necessary to allocate more than one tape track for sequenced parts. Now, shuttling to different points in the song is quick and effortless. POCKET SYNC writes a special FSK sync tone on one track of tape that is converted to MIDI Clock and Song Position Pointer on playback. Merging of data from the MIDI input to the output allows new sequencer tracks to be added while remaining synchronised to tape.

Automatic switching between write (recording FSK) and read (playback FSK) cuts downs on confusing switches and buttons. Tape oxide dropouts are no longer a problem with POCKET SYNC's variable dropout protection. The sequencer can continue playing over a dropout for a short time, even if FSK code is completely lost!

**Order Code: PP003** **£69 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POCKET FILTER

- Filter on all MIDI channels • Filter controllers, System Exclusive and real-time data • Combine data types/channels • DIP switch selectable filtering • Select channel from any keyboard • Filter all data on selected channels

POCKET FILTER is a vital tool for problematic setups. With MIDI data becoming increasingly complex, POCKET FILTER can unclutter the MIDI data stream, sending only the most useful info. Use it to remove unwanted clock messages or System Exclusive data or memory-intensive aftertouch and controller information. POCKET FILTER frees-up unused MIDI Channels from multitimbral synths, making them available for other modules. In addition, it can be used to channelise older synths that only receive in Omni mode.

**Order Code: PP008** **£69 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POCKET PEDAL

- Sends on multiple MIDI channels • Supports 1 continuous controller • Supports 1 momentary footswitch • Sends pitch-bend, modulation, portamento time, and MIDI Volume • Sends sustain, portamento on/off, sustenuto, and start/stop • Auto pedal/footswitch calibration • Forward/Reverse pedal operation • 3 mode pitch-bend operation • Combine data types

POCKET PEDAL is an indispensable controller for the performing musician. Use it with an ordinary volume pedal and footswitch to send MIDI volume, modulation, and sustain controls on all 16 MIDI channels simultaneously. For owners of multi-effects processors, POCKET PEDAL provides a convenient cost-effective way of providing dynamic control over effects parameters. It is also a handy controller for automated mixdowns, converting any resistive input into MIDI Controller messages for VCAs. Connect a photocell to POCKET PEDAL and control MIDI parameters with a light source!

**Order Code: PP009** **£69 inc. VAT.**  
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## POCKET TRANSPOSE

- In-line 16 Channel transposer • +/- 5 Octave transpose range • Switch between normal and transposed modes • Separate intervals for each channel • Transpose key signature and octave simultaneously • All non-transposed MIDI data is passed • Harmonisation mode • Footswitch controllable.

POCKET TRANSPOSE is a performance-orientated transposer that supports separate transpose intervals for each MIDI channel. Although many keyboards have a transpose function, it's usually too cumbersome for live use. POCKET TRANSPOSE makes transposing easy. Intervals can be set while playing, and the user can select the normal or the transposed setting from a footswitch. Guitar synth players can use the POCKET TRANSPOSE to set intervals on 6 separate MIDI channels, or use it to transpose all strings by a certain amount. POCKET TRANSPOSE provides an easy way to try different arrangements without altering sequencer data. You can even set it so that the drum machine channel remains intact.

**Order Code: PP011** **£69 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POCKET MAC

- Economical Macintosh MIDI interface • No external power supply required • 1 MIDI In, 2 MIDI Outs • LEDs indicate MIDI In/Out data • Uses serial or modem port • High speed CMOS design • Improves signal to minimise data errors.

POCKET MAC opens up a whole new world of MIDI programs for the Macintosh computer user. With many Macintosh programs simultaneously supporting both the serial port and the modem port, one POCKET MAC could be connected to each allowing access to twice as many MIDI devices.

**Order Code: PP004** **£39 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POCKET MAPPER

- Remaps MIDI controllers • Maps Pitch Bend to Aftertouch • 'Set and forget' programming • Supports 15 controllers • Allows unconventional routings • Updates older keyboards.

POCKET MAPPER allows modulation routings to be customised to suit a particular need. Controller data such as Pitch Bend, Aftertouch, Breath Control and others is received and can be retransmitted as a different controller. For instance, DX7 Breath Control modulation can be rerouted to MIDI Volume to modulate synths that do not accept Breath Control. POCKET MAPPER is the most convenient and cost effective way of rerouting MIDI modulation. Now, MIDI wind instruments can remap mouthpiece Breath Control to Aftertouch quickly and easily.

**Order Code: PP006** **£69 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POWER PACK

- 'Phantom' powers all Pocket Products • Functions in-line with MIDI signal • Powered by most AC adaptors • Automatic polarity switching • Fully regulated supply • Passes all MIDI data • Alleviates hook-up problems • Boosts MIDI signal

POWER PACK provides power to Pocket Products in instances where upstream devices from other manufacturers have neglected to meet MIDI specifications, or in any instance where power is unavailable. POWER PACK can be placed anywhere in the MIDI chain and accepts power from a standard AC adaptor (not included). It provides additional power when more than 4 Pocket Products are used in a row or allows POCKET PEDAL and POCKET FILTER to retain their channel settings when the master device is turned off. What's more, POWER PACK can be used to boost the MIDI signal and extend the maximum distance between two devices.

**Order Code: PP012** **£29 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POCKET CHANNEL

- Remaps Receive channel • Remaps Transmit channel • Sends multiple MIDI channels • Velocity-switch mode • Footswitch controllable

POCKET CHANNEL takes data from any MIDI channel and remaps it on to one, several, or all 16 MIDI channels. Up to 16 different channel assignments are possible. A unique velocity-switch feature allows automatic switching between two different sound modules depending on the key velocity. Use POCKET CHANNEL to organise channel assignments for a multitimbral sound module, or send a controller's output to two or more MIDI channels. With POCKET CHANNEL, for example, two drum machines or two samplers can share the same note assignments and be set to two separate MIDI channels.

**Order Code: PP014** **£69 inc. VAT.**  
Postage: UK £2.50 Europe £4.95 ROW £8.95

## POCKET MERGE

- Merges 2 MIDI signals into 1 • Handles System Exclusive • Merges on all 16 MIDI channels • Merges Clock and MIDI Time Code • Merges all controllers • Handles large volumes of data • Stackable for 3 or more inputs

POCKET MERGE is an essential tool for sequencing or live use. Operating as a 2-In, 1-Out MIDI Merger, several Pocket Merges can be stacked to merge more than 2 inputs. Now any controller can be a 'master'. In live setups, POCKET MERGE allows any two controllers (keyboard, drum pads, guitar synth, etc) to share a sampler or sound module. Use one keyboard as a master, while using a favourite pitch bender from another, or combine two keyboards for a multi-tiered, organ-style controller. In the studio, POCKET MERGE is a must for sample dump editors, allowing a keyboard and a computer to be connected to the sampler at the same time. POCKET MERGE handles data very quickly, making buffer overflows a thing of the past.

**Order Code: PP007** **£59 inc. VAT.**  
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## POCKET SPLIT

- 8-Zone Keyboard Splitter • Range from 1 to 127 notes • Fixed boundaries • MIDI Channel/Zone assignment • Footswitch controllable • Floating split point

POCKET SPLIT is an 8-zone keyboard splitter. Each zone has its own MIDI Channel, and has a range of 1 to 127 keys wide. Zone boundaries can be set for hard or soft (overlap or splits). Use POCKET SPLIT to maximise the performance of your master keyboard, or create interesting performance possibilities with your guitar controller. An added feature is an 'intelligent' 2-way floating split that automatically tracks the keyboard player's left and right hands. Now any MIDI device can have the features of a sophisticated MIDI controller at a fraction of the cost!

**Order Code: PP013** **£69 inc. VAT.**  
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## POCKET THRU

- 1-In, 3-Out MIDI Thru box • High-speed CMOS design • Very low power requirements • Buffered outputs clean up data • Handles all MIDI data • Stackable for more outputs

POCKET THRU is an essential building block for any MIDI setup and an excellent companion product for all Pocket Products. POCKET THRU provides 3 buffered outputs from a single MIDI input. Use POCKET THRU to minimise MIDI delays, or expand the outputs of a POCKET MERGE unit. POCKET THRU also allows POCKET FILTER to be placed anywhere in the MIDI chain, when using it to channelise older synths. Up to 4 POCKET THRU's can be combined to provide a total of 9 outputs.

**Order Code: PP010** **£35 inc. VAT.**  
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## HOW TO ORDER

To order, just fill out the Order Coupon at the back of the Mail Order section (remember to add postage for each product) or simply call our Mail Order hotline on 01954 789888.

DON'T DELAY ORDER TODAY!

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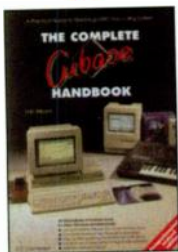


# SOS Book Shop

## BEST SELLERS

### THE COMPLETE CUBASE

**HANDBOOK  
2nd Edition**



by *Lido Weyers*

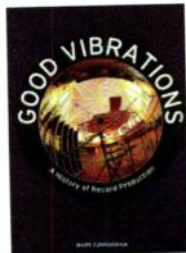
After a short break, the definitive Steinberg Cubase Handbook is back in print. This new edition is once again filled with real world applications and down to earth explanations of how to use all the

powerful features offered by Cubase in all its many forms. The book is now relevant to all three platforms (Atari, Mac and PC), and the main attraction of the revised text is its focus on Cubase Score. The Complete Cubase Handbook is a not-to-be-missed purchase for users of Steinberg's highly popular software.

**CODE B195 £29.95**

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### GOOD VIBRATIONS



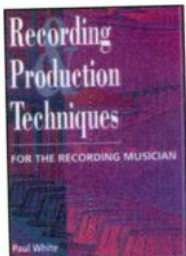
by *Mark Cunningham*  
*Good Vibrations — A History of Record Production* features a foreword by BRIT award-winning Best Producer of 1996, Brian Eno. The book chronicles the development of recording techniques and music technology, from the

invention of sound-on-sound (multitrack) tape recording in 1949, to the current dramatic advances in digital technology. Also highlights the changing role of the producer and engineer, with quotes from George Martin, Brian Wilson, Tony Visconti, Trevor Horn, Hugh Padgham and Pete Waterman. Recordings discussed in detail include The Beach Boys' *Pet Sounds*, The Beatles'  *Sgt Pepper's Lonely Hearts Club Band*, Pink Floyd's *Dark Side Of The Moon*, Queen's *Bohemian Rhapsody*, David Bowie's *Heroes*, and U2's *Zooropa*. Includes around 100 photos and illustrations, many previously unseen, plus extensive reference section.

**CODE B331 £9.99**

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### RECORDING & PRODUCTION TECHNIQUES



by *Paul White*. This highly informative book by SOS's own Editor demystifies the techniques used by professionals in the recording of contemporary music.

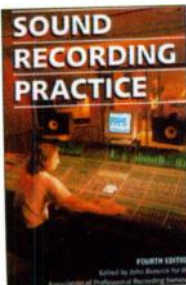
It reveals how to make full creative use of all manner of studio effects and signal processors. These techniques can be utilised both in the home and commercial studio. The book concludes with an invaluable section on master tape formats and an overview of the various processes and vinyl records.

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### SOUND RECORDING PRACTICE (4th Edition)

**NOW IN PAPERBACK!**



by *John Borwick*

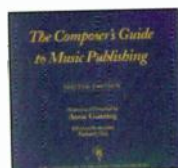
This now classic text reaches its Fourth Edition, and has been enlarged and revised to cover up to date developments in the recording industry. The contents of this 600+ page is too diverse to summarise in such a short space. Suffice to say that every

serious recordist, whether amateur, semi-pro or professional should have a copy of this book.

**CODE B107 £19.99**

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### THE COMPOSER'S GUIDE TO



**MUSIC PUBLISHING (2ND EDITION)**

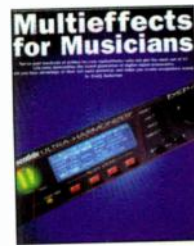
written & compiled by *Annie Gunning*

This book has been produced by the Association of Professional Composers and examines the business of musical copyright and music publishing from the composer's point of view. It aims to educate composers of all kinds of music in the operation of the music publishing business to help them obtain, negotiate and benefit from publishing agreements and avoid expensive mistakes. Apart from publishing, the book also covers copyright legislation, performing and mechanical rights, the royalty administration societies, music in film, broadcasting, theatre and ballet and commissioning agreements. There is also advice for composers setting up their own publishing companies. An exhaustive and useful book.

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### MULTI-EFFECTS FOR



**MUSICIANS**

by *Craig Anderton*  
Occasional SOS contributor Craig Anderton adds to his long list of music technology-based books with this comprehensive look at multi-effects units. The book helps you with what to look for when buying

a new unit, how to use it when you've got it home, and provides a collection of tips to help you get the most out of your device. 137 Pages.

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by *Gabriel Jacobs & Panicos Georgiades*  
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### HARD DISK RECORDING FOR MUSICIANS

by *David Miles Huber*

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### TECH TERMS - A Practical Dictionary for Audio and Music Production

by *George Petersen & Steve Oppenheimer*

This is a concise collection of definitions of electronic music and recording terms; 300 words and phrases are given quick accurate definitions in plain English. So if you're new to recording, synths, samplers and MIDI, this book could be a

big help in getting your mind into the terminology.

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### THE SECRETS OF MUSICAL CONFIDENCE - How to Maximise Your Performance Potential



by *Andrew Evans*

Written by a musician and psychologist, this is claimed to be a first for musicians: a book aimed at maximising performance potential and increasing confidence. A series of questionnaires and exercises allow you to analyse your abilities and needs and allow management, amongst other topics.

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by *Godric Wilkie*

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## RECOMMENDED READING

### INTRODUCING DIGITAL AUDIO

**2ND EDITION** by *Ian R Sinclair*  
Explains digital audio - CD, DAT and sampling - non-mathematically. The updated 2nd edition adds information on oversampling and bitstream techniques, plus a glossary of technical terms.

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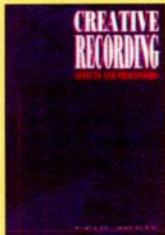
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by Paul White  
The first in this major series, Effects and Processors is a complete guide to the outboard equipment which has today become an integral part of popular music. A comprehensive analysis of studio effects and signal processors, it provides detailed

coverage of each piece of equipment: how it performs its respective task, what effect it has on the sound, and its role in creative music production.

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by Paul White  
A complete guide to understanding and using microphones in a recording environment.

In plain English, it explains how the different types of microphone work, discusses the advantages of the various different types, and shows how they can be used to get the sound you want onto tape.

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By Paul White  
Soundproofing, Acoustics and Monitoring 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 give the optimum monitoring environment and how to choose and use your monitor system.

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**RECORDING**

**HOT TIPS FOR THE HOME RECORDING STUDIO**



by Hank Linderman  
Learn how to lay down music the way you want it to sound, with advice for getting the best from your mixer, multitrack, compressor etc. Discover tricks and what traps to avoid, unlock the mysteries of timecode, prevent noise problems. Packed with sound advice.

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**THE MUSICIANS GUIDE TO HOME RECORDING**



by Peter Melan & Larry Wichman (Revised and Updated)  
This is the book every serious songwriter, musician, and home recordist needs, with a new chapter on MIDI and the latest digital recording technologies. A problem-solving guide as well as an instructional text, it is designed to explain in simple terms how professional recording techniques can be applied at home.

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**MACKIE COMPACT MIXERS**



by Rudy Trubitt  
Journey through the design and features of mixers so you can maximise the use of this essential and very flexible audio component. Using Mackie's wildly popular MS1202 and CR1604 mixing desks as a foundation, the book explains general concepts as

well as model specific operating tips. Topics include: mixing basics, real world applications, hooking things up, mixing tips, block diagrams and a glossary.

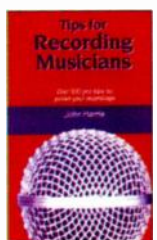
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**PRACTICAL STUDIO TECHNIQUES**

by Tom Misner  
This book and audio CD package comes from the School of Audio Engineering's Tom Misner. It's an excellent source of basic recording facts and figures, and if you want concrete examples of the subjects discussed, then listen to the free mixdown demonstration CD.

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**TIPS FOR RECORDING MUSICIANS**



by John Harris  
Today's studio equipment is affordable but sophisticated, and it takes a lot of know-how to use all this technology effectively. This book details the equipment you need - mics, effects, tape machines, etc. It has separate sections on recording of vocals, electric guitar, drums and acoustic instruments, as well as the use of MIDI in the recording process. You will learn how to get the best from delay and reverb, as well as effects like compression and gating. There are some useful tips on using the mixing desk and post production work. All in all it's a handy guide that will improve your recording techniques at a stroke.

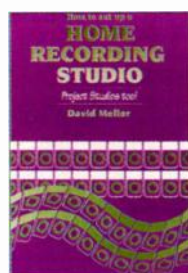
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**RECORDING TECHNIQUES FOR SMALL STUDIOS**

by David Mellor  
This well written, user-friendly book is designed to offer accessible and helpful tips on how to get the most out of the equipment in your studio. Chapters cover: mic techniques; musical arranging for recording; 4-track recording; the mixer; preparing for an running a session; recording drums; recording vocals; integrating MIDI; using effects and signal processing; location recording, and digital recording. The book is rounded off with an "any questions" section, a glossary and a list of recording studios in the UK. As you would expect from a book based on an SOS series, this is a *must have!*

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**HOW TO SET UP A HOME**



**RECORDING STUDIO**

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by David Mellor  
If you are thinking of setting up a home studio, a project studio or a DJ studio, this book is the place to start. It takes a highly practical 'nuts and bolts' type of approach to help you produce an efficient and productive studio. It covers soundproofing, keeping the sound in and the noise out, acoustics, studio layout, and studio equipment, and advice on the kit you are likely to need. The book ends with an invaluable questions and answers section, a glossary of terms and a list of contacts.

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**SAMPLERS**

**WHAT'S A SAMPLER?**

By Freff  
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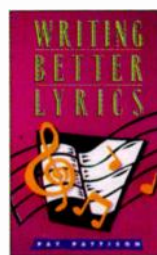
**MUSIC BUSINESS**

**SUCCESSFUL LYRIC WRITING**

by Sheila Davis  
Superb guide to the art of writing words to music. Learn how to create a memorable song title, choose the best music form for each idea, apply writing principles and avoid common pitfalls, write with both sides of your brain, find your voice. Includes songwriter's bibliography and lists over 60 songwriting organisations to help you connect with your chosen marketplace.

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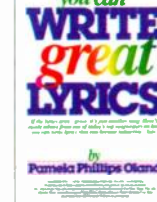
**WRITING BETTER LYRICS**



by Pat Pattison  
In-depth approach to lyric writing examines 17 songs to discover what makes them so effective. Learn a warm-up exercise that will revolutionise your songwriting imagery, how to use a rhyming dictionary to unlock fresh, unexpected rhymes, avoid clichés and create imaginative metaphors and similes.

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by Pamela Phillips Oland  
This book helps you develop your own philosophy and style. Its plentiful techniques, combined with practical advice and exercises, will have you writing great lyrics before you know it!

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**MUSIC PUBLISHING**

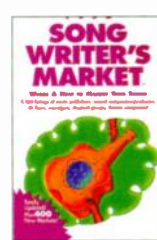


by Randy Poe  
This book demystifies music publishing, explaining what it's all about and what it means to a songwriter. Learn what your publishing options are, from a single song contract to a staff writer to a self-publishing operation. By the

time you have finished this book you will never make an uninformed decision about publishing your songs that you will later regret.

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**SONGWRITERS MARKET**



1997  
To get your songs published and produced, you must know who the music industry's players are and how to approach them. This directory identifies those seeking the work of songwriters. Lists 2500 lyric and music markets, clubs, associations, contests, workshops and songwriters publications. Includes 'The A & R Roundtable', where pro discuss their role in a songwriter's career, business side of songwriting, music industry trend report, and interviews with music industry professionals.

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**88 SONGWRITING WRONGS & HOW TO RIGHT THEM**



by Pat & Pete Luboff  
This is a real workbook for songwriters, dealing with both the craft and art of songwriting. Song structure, rewriting, matching lyrics to music, collaboration, making the right demo, pitching the final result, and business

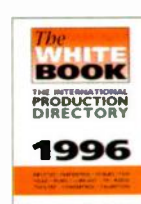
matters.  
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**CAN YOU SING A HIGH "C" WITHOUT STRAINING**

by Thomas Appell  
This book features extensive coverage of the vocal cords and explains clearly how to sing high notes without going into falsetto, and without straining. You'll learn how to extend the range of your voice, and why most singers either strain or "break" into falsetto when attempting to sing above their normal range. It comes with 2 CD's jam-packed with over 2 hours of vocal examples and exercises that you can practice with. Many singers have increased their range by several notes after the first week of practice. If you can't sing high notes without straining, but would like to know how, then this book is for you. 122 pages.

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**THE WHITE BOOK INTERNATIONAL PRODUCTION DIRECTORY**



1996  
This is the latest edition of the essential source of contacts for artists, performers, venues, services and facilities associated with music, concerts, shows, festivals, film, TV, video, conferences, exhibitions and corporate hospitality - there's a comprehensive international section. The layout is logical and an index makes fact finding an easy task - altogether an indispensable 864 pages. The new edition once again comes with a complementary copy of The Little White Book, which distils the contents of the larger volume to a pocket-sized list of names and phone numbers.

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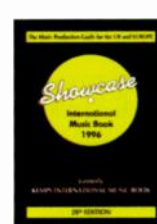
**SONGWRITER'S WORKSHOP**



Edited by Harvey Rachlin  
If you want to work systematically at improving your songwriting skills, then try this book: it's divided into four individual "lessons", each of which is backed up by audio material on cassette. This allows you to listen in the car or walk around with your personal stereo and still absorb useful information. The four sections are: On Songwriting by Janis Ian (yes, the Janis Ian!); Making Demos by John Barilla; Understanding MIDI by James Becher; and The Art of Pitching Songs by Teri Muench (ex-A&R director with RCA and publisher). Also included is an intro, a quick and breezy glossary and an index. Includes two cassettes.

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**SHOWCASE INTERNATIONAL MUSIC BOOK 1996**



The music industry equivalent of *Yellow Pages!* over 500 pages crammed with all the latest information, including new phone and fax codes for record companies, recording studios, music publishers, equipment manufacturers, artist management, producers, PA and lighting hire, and more. Plus a USA section.

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**CREATING MELODIES**



**by Dick Weissman**  
Learn how to create memorable melodies, from love ballads to film scores and jingles. Using lots of examples of popular songs and styles by top-name musicians, Weissman covers the full range of melody writing. Learn how to marry music to lyrics, relate rhythm to the message of your song, read and write musical notation, write instrumentals for films, TV, commercials and theatre, and put together a demo tape.

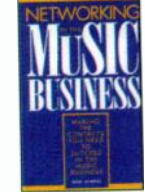
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**THE SONGWRITER'S GUIDE TO COLLABORATION**

**by Walter Carter**  
This book describes what to expect when entering into a co-writing situation and how to make the arrangement work. Covers the pros and cons, how to find a partner, publishing your songs, who writes what, money matters, sharing success and rejection, growing together or apart plus co-producing and pitching.

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**NETWORKING IN THE MUSIC BUSINESS**



**by Dan Kimpel**  
Think of this book as a popular psychology course for musicians. If you feel you could benefit from developing a positive attitude to getting ahead in your area of the music business, then *Networking* is for you. There's nothing like it for good, sensible advice: it's often not enough to have talent. To be successful, you'll need to persevere, have good "people skills", and exercise good networking skills. Success depends on what you know, who you know, and perhaps most importantly, who knows you. An essential book, and a snip at £11.95. Hardback.

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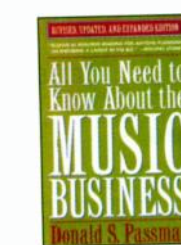
**BEGINNING SONGWRITER'S ANSWER BOOK**



**by Paul Zollo**  
If you're just starting out as a songwriter or haven't progressed very far, perhaps you have questions about the art and business of songwriting that you can't find answers for. Chances are, they're covered in this book. Over 200 of the questions songwriters most often ask are answered in this book. There are 11 chapters, covering subjects such as lyrics, theory, song structure, collaboration, demos, publishing and the music business. Some answers - such as "What makes a professional-sounding demo?" are actually mini-articles - and an index allows you to target subjects without wading through the text. A friendly, informative read.

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**ALL YOU NEED TO KNOW ABOUT THE MUSIC BUSINESS**



**by Donald S. Passman**  
This book is a must: the author manages a portfolio of high profile clients and teaches music business law at the University of Southern California, and has produced a clear overview of the music business. He starts at the beginning of your career, with advice on choosing a manager, lawyer and agent, and moves through getting a record deal, songwriting and music publishing and finishes with details of copyright, mechanical royalties, songwriter deals, films and more. An exhaustive and entertaining read. 415 Pages.

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**THE SONGWRITER'S MARKET GUIDE TO SONG & DEMO SUBMISSION FORMATS**



**From the Editors of Songwriter's Market**  
If you've got the songs and you've got the contacts, this book will help you to choose a format that will get your demo heard as well as overall packaging and presentation and dealing professionally with publishers, A&R reps and other industry people. Plenty of example documents (lyric sheets and letters) are given, and the book is nicely rounded off with a glossary and index. Hardback.

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**THE MUSICIAN'S GUIDE TO READING & WRITING MUSIC**

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**SONGWRITERS IDEA BOOK**



**by Sheila Davis**  
If you want a textbook, this is it: 250 pages of serious, intelligent insight into songwriting. Loads of good advice and a friendly tone make this a useful read to anyone, whether beginner or seasoned pro. The focus is firmly on lyrics rather than music, and the prominent references to poetry terminology shouldn't really be a surprise. Use Davis' 40 strategies and you could soon be "designing distinctive songs". Hardback.

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**by Marta Woodhull**  
The title says it all. If you're already a singer, this book gives you everything you need to know in order to exploit your talent further: looking after your voice, voice exercises, business advice and marketing and audience interaction are all covered in this straightforward book.

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**MIDI INFORMATION**

**MUSIC TECHNOLOGY REFERENCE BOOK**



**by Peter Buick & Vic Lennard**  
Written by Peter Buick and Vic Lennard (author of SOS's Atari Notes column), this book offers information at your fingertips and is an indispensable reference source for the musician or sound professional in the recording, broadcast, live, video, computer, multimedia, post production and theatre industries. It includes comprehensive MIDI spec, General MIDI, MTC, MSC, and SysEx information. It also includes charts, check lists, useful hints, tips, and ideas, plus a glossary, list of contacts and a comprehensive indexed, it is also organised into convenient sections. 150 Pages.

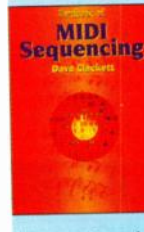
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**PRACTICAL MIDI HANDBOOK (3rd Edition)**

**by R.A. Penfold**  
This book is completely updated, and features a section on General MIDI. It provides a "straightforward, non-mathematical introduction to MIDI", and features a full glossary of MIDI terms.

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Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

**HANDBOOK OF MIDI SEQUENCING**



**by Dave Clackett**  
Hands On MIDI Software's Dave Clackett has boiled his knowledge into a collection of tips for getting the best out of hardware or software sequencers. Dave covers the hardware and software you need to get sequencing, and introduces the basics of sequencing and notation, with particular emphasis placed on using General MIDI/GX/XG sound sources. Recommended.

**CODE B333 £13.95**  
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

**ADVANCED MIDI USER'S GUIDE (2nd Edition)**



**by R.A. Penfold**  
Most MIDI users do no more than scratch the surface of MIDI's potentialities. But dare to dig a bit deeper and you'll find a whole new world of creative possibilities. With the Advanced MIDI User's Guide, you'll learn how to optimise your MIDI system to get the best results from your particular setup, and you'll find out how to use gadgets like switchers and mergers to enhance your system. If you want to incorporate a multitrack tape recorder into your MIDI system there's a section on synchronisers, SMPTE and MIDI time code, and retro freaks will learn how to hook up that dusty old analogue synth to their MIDI systems.

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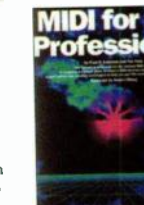
**MAKING THE MOST OF MIDI**



**By Paul Overaa**  
This is a MIDI book unlike any other. It explains the fundamentals of MIDI and MIDI sequencing for the beginner, and it goes much further, dealing with issues that will be of help to more established users. Advice on MIDI fault finding, help for musicians using sequencers with live bands, MIDI messages and MIDI files, plus programming material. So if you are a keen first time user or a MIDI veteran, there will be something in this book to interest you.

**CODE B321 £14.95**  
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**MIDI FOR THE PROFESSIONAL**



**by Paul D. Lehrman and Tim Tully**  
Co-written by SOS contributor Paul D. Lehrman, this substantial, exhaustive work covers pretty well any aspect of MIDI that you could think of. As an overview of what MIDI is and does in 1994, this 239 page book couldn't be better.

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**MIDI SURVIVAL GUIDE**



**by Vic Lennard**  
Whether you're a beginner or a seasoned pro, the "MIDI Survival Guide" shows you the way. No maths, no MIDI theory - just practical advice on starting up, setting up and ending up with a working MIDI system. Contains over 40 cabling diagrams, and how to: connect synths, sound modules, sequencers, drum machines and multitracks; how to budget and buy secondhand; using switch, thru and merger boxes; transfer songs between different sequencers, get the best out of general MIDI, and understand MIDI implementation charts.

**CODE B196 £7.95**  
Postage: UK £1.50, Europe £3.95, R.O.W. £5.50

**A BEGINNERS GUIDE TO MIDI**

**by R.A. Penfold**  
The title says it all: all aspects of MIDI are explained, and many common beginner's problems are discussed.

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**THE ARC MUSICIANS' DIRECTORY**

The new Musicians' Directory from Arc Publishing aims to provide all things to all musicians: whatever your style of music, the comprehensive listings offer you the contacts you need, whether it's labels, studios, venues, music shops or management - and that just scratches the surface of the dozens of topics covered by the book. Apart from being a directory proper, the Handbook also includes a selection of useful articles, including subjects such as how to be a session player (by SOS's very own Paul White), music publishing, releasing your own record, copyright protection, accounting, legal advice and more. The Musicians' Directory offers over 380 information-packed pages for little more the price of a new CD.

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**SYNTHESIZERS**

**KEYFAX 5**



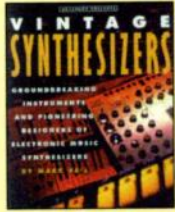
**by Julian Colbeck**  
The latest instalment in the intrepid Keyfax series offers potted specifications and concise mini-overviews of digital pianos, home keyboards, General MIDI modules, stage organs and computer sound cards. Look out for company backgrounders, contact details and cross-references to earlier Keyfaxes.

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# SOS Book Shop

## VINTAGE SYNTHESIZERS

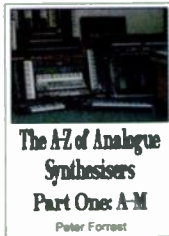


By Mark Vail  
This well-illustrated, 300 page book covers synth history, interviews with designers and overviews of important instruments. Mark Vail's book could be the most

entertaining and useful synth book yet - check out the definitive history of the Minimoog, complete with pre-production designers' sketches. While not strictly a buyers' guide, there is a comprehensive section to sourcing, valuing, upgrading and servicing classic instruments.

**CODE B199** **ONLY £16.95**  
Postage: UK £2.50, Europe £6.95, R.O.W. £9.50

## THE A-Z OF ANALOGUE SYNTHS PART ONE: A-M



by Peter Forrest  
The author has aimed to make his book a complete rundown of all the major analogue synths and keyboards ever made, and on the evidence of this first volume, he seems to have succeeded. The book is useful and detailed, and shows evidence of the

massive amount of research and effort put in by Peter. He gives pocket company histories and detailed data on the instruments produced - but note that a few entries for a few particularly obscure instruments and companies are limited due to lack of data. The book also provides a comprehensive overview of the qualities of various instruments; charts and tables assess second hand values and maintenance levels necessary to keep a given instrument playable as well as such intangibles as sound quality, collectability and user interface. The A-Z of Analogue Part One, which is limited to 8000 copies worldwide, also features 96 colour pictures of classic instruments.

**CODE B294** **£14.00**  
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

## KEYFAX 2

by Julian Colbeck

1989 version of Keyfax provides individual summaries and specifications of the last of the great mono synths, digital pianos, and classic polysynths like the Roland JX10 and Prophet VS - forerunner of the SY22 and Wave Station. Early Keyboard and rack-mount samplers are covered in this indispensable guide. Still a great buy.

**CODE B096** **ONLY £5.99**  
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

## THE MUSEUM OF SYNTHESIZER TECHNOLOGY



by Martin J Newcomb  
If you liked our feature on the opening of the Museum of Synthesizer Technology in October, but haven't got the time or the cash to visit in person, then the next best thing has to be the museum's guide book. This 118 book is printed on glossy

paper and contains full-colour pictures of a large selection of exhibits from the museum, together with some descriptive text and company backgrounders. The text reads a little like a fanzine, but the hardcore synth fanatic will want this book for the pictures. In these pages you will glimpse instruments that you are unlikely ever to experience in the flesh: an exceedingly large Roland System 100 modular set-up, an EMS Synthi 100, an ARP 2500, a large Emu modular and what must be the comprehensive collection of Moog equipment anywhere.

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Postage: UK £2.50, Europe £6.95, R.O.W. £9.50

## DRUM MACHINES

### DRUM PROGRAMMING — A Complete Guide to Program and Think Like a Drummer



By Ray F Badnes  
Coming from a publisher that has a good range of real drum texts, we'd expect this book to be a little different. And it is: it gives plenty of insights into how real drummers approach their job, and there are plenty of example patterns to help translate these ideas to

a drum machine.

**CODE B235** **£6.95**  
Postage: UK £1.50, Europe £4.95, R.O.W. £7.50

### DRUM MACHINE RHYTHM DICTIONARY

By Sandy Feldstein

For use with Roland drum machines or any grid-based pattern system. First 75 pages on programming huge range of rhythms in rock, latin, jazz and funk styles. Remainder analyses styles and patterns of world's top drummers - Phil Collins, Billy Cobham, Steve Gadd, Stewart Copeland, etc. Highly recommended.

**CODE B110** **£16.95**  
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

### RHYTHMICAL GROOVES & PATTERNS

By Siegfried Hoffman

Looks at how drummers compose rhythm patterns to add emotion, swing or groove. Contains examples for you to programme into your drum machine or sequencer.

**CODE B115** **£11.50**  
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### 260 DRUM MACHINE PATTERNS

By Rene-Pierre Bardet

Even more drum pattern styles (paso doble, charleston, etc.)

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### DRUM MACHINE PATTERNS

By Rene-Pierre Bardet

200 drum patterns and breaks presented in one-measure grid notation. Funk, R'n'B, ballad, pop, reggae, afro-cuban and many other styles.

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## PLAYING TECHNIQUES

### SOLID GROOVES

By Dieter Pirvest & Herb Quick

128 pages dealing with both bass and drums, the 'heart' of the pop group, together. Although written primarily for drummers and bass players, anyone interested in understanding rhythmical music in popular styles will find this book invaluable.

**CODE B172** **£11.50**  
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

### 1000 KEYBOARD TIPS



by J Dreksler & Q Harle  
The hi-tech musician's guide to the basics of music, scales, chords and harmonies. 256 pages covering chord relationships, improvisation, suggested drum machine patterns, plus comprehensive chord table. Too good to miss!

**CODE B113** **£13.95**  
Postage: UK £2.50, Europe £6.95, R.O.W. £9.50

## CLASSICS IN SEQUENCE

by William Lloyd & Paul Terry

Takes concepts behind Music In Sequence and applies them to all-time favourite classical music scores. Authors show how to make fresh, exciting interpretations of classic scores. Info on reverb and effects, interpreting scores, editing synth voices. Highly creative—an ideal workbook for the music classroom. Covers Medieval, Renaissance dance music, Bach's Toccata in D minor, Vivaldi, Purcell, Handel; opera excerpts from Rossini, Verdi, Borodin; Mozart, Schubert, Tchaikovsky, music from Carmina Burana; Debussy, Satie, Steve Reich's Piano Phase and more. Highly recommended.

**CODE B193** **£12.95**  
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

## ROCK IN SEQUENCE

by William Lloyd & Paul Terry

The latest book from the authors of Music In Sequence and Classics In Sequence is now available: Rock In Sequence offers detailed scores of 17 rock and pop hits from the '50s to the present day, alongside a collection of helpful sequencing tips.

Songs are included from the likes of Eurythmics, Blur, The Beatles, Led Zeppelin, Abba and others. 112 pages.

**CODE B320** **£14.95**  
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

## MUSIC IN SEQUENCE

by William Lloyd & Paul Terry

Still one of our best-selling books. Easy to follow, practical guide to making real use of your sequencer, written by people who really understand music and how to create it using today's technology. This brilliant, unique book carries the SOS seal of approval.

**CODE B155** **£12.95**  
Postage: UK £2.50, Europe £5.50, R.O.W. £8.50

## COMPUTERS & MUSIC

### MUSICAL APPLICATIONS OF THE ATARI ST'S



By R A Penfold  
Includes a general introduction to MIDI, a handful of MIDI add-on circuits (Thru box, MIDI switcher and so on), plus a collection of programs, in Fast BASIC, that allows you to use the ST's internal

sound generator and create little MIDI applications.

**CODE B280** **£5.95**  
Postage: UK £1.50, Europe £4.95, R.O.W. £7.50

### MULTIMEDIA ON THE PC



By Ian R Sinclair  
If you want to know what multimedia is and what it can offer you, then this is the book for you. Much of the information is general enough for everybody, but as the title suggests, the book is aimed at PC users.

The book explains the installation and use of a CD ROM drive and a sound card and covers all key concepts behind multimedia. As an added incentive, if you buy this book, you can send away for a free copy of Picturebook, a multimedia authoring package.

**CODE B272** **£11.95**  
Postage: UK £1.95, Europe £4.95, R.O.W. £7.50

### THE COMPLETE SOUND BLASTER



by Howard Massey  
Explains in simple, non-technical terms: how to install the Sound Blaster hardware and software for use in both the DOS and Windows environments, the two sound processes used by the card, MIDI, the Sound Blaster's MIDI capabilities, and the many different applications for the Sound Blaster, including the various software utilities provided with the card, and many of the third party support products that enhance its operation.

**CODE B313** **£10.95**  
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

## SEQUENCER SECRETS

by Ian Waugh

Ian's book aims to "go beyond the manual" in telling you how to get the best from your sequencer. The book features 29 hands-on sequencing projects and is suitable for use with all software sequencers. The book hopes to help you optimise your MIDI system and use your sequencer to create all sorts of useful effects. A troubleshooting section helps you track down stuck notes, double notes and so on.

**CODE B299** **£6.95**  
Postage: UK £1.50, Europe £4.50, R.O.W. £6.50

## PC MUSIC HANDBOOK 2nd Edition

by Brian Heywood & Roger Evan

This book will show you how to turn your PC into a creative music making machine. It explains how you can create very sophisticated music on your PC by running sequencing software, how to create your own sounds with a soundcard, how to use your PC as a sound librarian, or a sample editor, or even use it as a hard disk recorder or a sound sampler. All these things are possible with today's sophisticated PC.

The use of sound in multimedia applications is also covered, and there is a chapter on PC hardware with advice on which type of PC is best for your particular needs.

There's advice too on getting connected to the Internet, where you can contact other PC music aficionados world wide!

**CODE B332** **£10.95**  
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50

## COMPUTERS AND MUSIC

By R A Penfold

2nd edition. Covers hardware and software applications. Excellent glossary of jargon, and now bang up to date.

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## LIVE SOUND

### PUBLIC ADDRESS LOUDSPEAKER SYSTEMS

by V Capel

All aspects of PA speaker systems are covered in this book, including low-impedance matching, 100V systems, transmission lines and how to install inductive hearing aid loops. At the heart of the book is the Line-Source Ceiling Array, a system that is claimed to improve clarity, even coverage and reduce feedback. Full step-by-step construction and installation details are given.

**CODE B283** **£3.95**  
Postage: UK £1.50, Europe £5.50, R.O.W. £8.50

### SOUND REINFORCEMENT HANDBOOK

by Gary Davis and Ralph Jones

From recording to broadcast, fixed installations to touring, this 400 page reference covers live sound setups, equipment, techniques and jargon.

**CODE B105** **£27.95**  
Postage: UK £3.95, Europe £7.50, R.O.W. £14.50

### LOUDSPEAKERS FOR MUSICIANS

**CODE B284** **£3.95**  
Postage: UK £1.50, Europe £3.95, R.O.W. £4.50

### INTRO TO LOUDSPEAKER ENCLOSURE DESIGN

by V Capel

The book provides both useful background to speakers and enclosures in general, plus practical information on crossovers and full details on constructing the so-called 'Kapellmeister' design of speakers.

**CODE B281** **£2.95**  
Postage: UK £1.50, Europe £6.95, R.O.W. £9.50

### LIVE SOUND MIXING



by Duncan R Fry  
This is a hands on, friendly introduction to all aspects of mixing live. It hails from Australia, and is an SOS Bookshop exclusive. The author is an experienced live sound engineer and has packed his book with loads of information, diagrams and hints to

take you from basic principles through to trouble shooting when things go wrong.

**CODE B256** **£19.95**  
Postage: UK £1.95, Europe £5.50, R.O.W. £8.50



**EMAGIC NOTATOR VIDEO TRAINING MANUAL**



This video manual is detailed and helpful, and is presented in a most friendly and approachable manner by session musician Tim Walter, whose tone throughout the video encourages and inspires confidence. If you are new to Notator and are still in awe of its power, this is the video to bring you down to earth. An introduction and 28 tutorials take the user from the absolute basics - including plugging in the dongle - to working with Unitor and SMPTE, and synchronising to video. As well as actual recording of MIDI data and sequencing, comprehensive coverage is given to using the score layout and printing facilities that are so much a part of Notator. Topics covered include: sequencing page, score editing, lyrics and text, graphic arranger mode, hyper edit, the printer page, using the part box.

**CODE V012** **ONLY £19.99**  
 Running time: 2 hours 20 minutes Format: VHS (PAL)  
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**WINDOWS 95: WHAT WILL YOU LEARN TODAY?**

**CODE V065** **£19.99**  
 Running time: 74 minutes  
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**MACKIE ULTRA MIX VIDEO GUIDE**

**CODE V066** **£9.99**  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**ROLAND GR09**

Presented by Roland UK product demonstrator Nick Cooper, this application-based tutorial video for the Roland GR09, produced in association with Roland USA, covers every function completely. Covered topics include: the GK2A Synthesiser Driver, pickup sensitivity, use of the tuner, what a patch consists of, use of the pedals, patch edit 1 & 2 (including layering and detune, chromatic function, reverb & chorus, edit target, pitch shift), the use of external midi devices, saving to an external sequencer & more.

**CODE V061** **£19.99**  
 Running Time: 57 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**ROLAND JV-1080**



**VIDEO MANUAL**  
 Roland's amazing JV-1080 synthesizer module is covered in detail in this informative video. Presented by Tim Walter the video guides you through the basics, and leads you painlessly onto the advanced features. The video even shows you how to fit the expansion

boards & gives demonstrations of some of the wonderful sounds they contain. Once again this video has been produced in association with Roland UK & USA to ensure that everything it contains is accurate, and relevant to the new and more experienced users alike.

**CODE V046** **£19.99**  
 Running time: 80 minutes Format: VHS (PAL)  
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**HOW TO GET A RECORD DEAL**

The facts you need from the people who know. How To Get A Record Deal contains vital information and insight that you will not find anywhere else, from artists and executives who have made it and know what it takes.

On this video music industry pros give you the straight facts on how to break into this extremely competitive business. Because sometimes the difference between success and failure is information.

Presented by the National Academy Of Songwriters

**CODE V003** **£14.95**  
 Running time: 1 hour 7 minutes  
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**ROLAND TDE-7K DRUM SYSTEM**

**CODE V045** **£19.99**  
 Running time: 65 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**STEINBERG CUBASE**



This manual is presented by Chris West, Steinberg expert. It's very much a practical, 'get up and running' video, showing the novice user exactly how to install and begin using Cubase, whether they're running the program on an ST, Mac or PC computer — there's even a basic background on using the computers themselves! All of Cubase's controls

are shown, explained and demonstrated in depth. Once you're familiar with the basic controls, Chris takes you slowly through recording your first session, followed by overviews of the various edit screens. It's rather like having an expert tutorial that you can run again and again in the comfort of your home, until you can use Cubase like a true pro. Topics covered include: the main screen, customising names and outputs, copying and pasting between arrangements, MIDI filter, cycle mode recording, the tool box, all edit screens.

**CODE V011** **£29.99**  
 Run time: 1 hour 30 minutes Format: VHS (PAL)  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**ROLAND MS-1 VIDEO MANUAL**

**CODE V047** **£24.99**  
 Running time: 30 minutes (approx)  
 Format: VHS (PAL)  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**BOSS DR-5 DRUM MACHINE**

Presented by Nick Cooper (Roland UK Product Specialist) this video covers all the functions of the DR-5 in a clear and concise manner. Produced in association with Roland UK & USA. By using the information gathered from Roland 'helplines', particular attention has been paid to the areas that many users find most difficult in. This makes it of interest to beginners and experienced users alike. Nick imparts the information with ease and a professional manner, making it enjoyable and entertaining.

**CODE V043** **£19.99**  
 Running time: 57 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**ROLAND XP-50**

This XP-50 video owners manual is produced by Roland Corporation US and covers all the major features of the instrument in detail. This is an application based video that provides many examples of how your new found knowledge can be applied. Just a few of the 30 separate topic areas covered are: Effects, Choosing Sounds, Loading a Song, Loop Recording, Copying a Track to Pattern, Making an RPS Set, Track Editing, Multitrack Recording, Patch Editing, Creating Splits & Layers in a Patch.

**CODE V063** **£24.99**  
 Running time: 63 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**SOS Videos**

**ROLAND G800**



Presented by Roland UK's product demonstrator Sara Reybould, this video covers every essential feature and function of the Roland G800. Sara provides the user with a wealth of knowledge on this sophisticated instrument, with recourse to many practical examples and close-up shots of the LCD screen. The video was produced in association with Roland USA and Roland UK to ensure that the content is accurate and informative.

**CODE V060** **£19.99**  
 Running Time: 92 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**YAMAHA PSR6000 KEYBOARD VIDEO MANUAL**

Yamaha's PSR6000 is a home keyboard with a difference, and offers many professional features plus excellent sound quality. Tim Walter starts at the beginning and makes the instrument look easy and fun. His enthusiasm is catching, and, yes, the PSR6000 is a very capable instrument. The tape runs to 75 minutes, which makes for excellent value.

**CODE V029** **£19.99**  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**ROLAND GR-1 GUITAR SYNTH**

**CODE V014** **ONLY £29.99**  
**FOR 2 VIDEOS**  
 Total Running time: 4 hours. Format: VHS (PAL)  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**BOSS ME-8**

Nick Cooper (Roland UK product demonstrator) explains every single feature and function of the ME-8 in detail. The unit is clearly explained in a logical sequence with examples given of how the functions effect the available sounds, a perfect aid to new users of the ME-8 and those who would like to get that little bit more from it. Just some of the main points covered are: What is a Patch?, Selecting a Patch, Copying a Patch, Edit Mode, Using The Effects, Control Effects, The Tempo Function, Manual Mode, and lots more.

**CODE V064** **£19.99**  
 Running time: 72 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**JUST ARRIVED!**

**MACKIE 8-BUS VIDEO MANUAL**



**VIDEO MANUAL**  
 Almost 60 minutes of fun-packed, detailed explanation of the various features of Mackie's popular range of 8 bus mixing consoles (16•8, 24•8, 32•8, 24•E) and how best to utilise them. Onscreen numbers allow quick searching to desired topics.

**CODE V068** **£9.95**  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**KORG AX30G TONEWORKS VIDEO MANUAL**

**ORDER CODE V028** **£19.99**  
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**ROLAND GP100**

**CODE V062** **£19.99**  
 Running Time: 45 Minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**EVERYTHING YOU WANTED TO KNOW ABOUT PCs BUT WERE AFRAID TO ASK!**

**CODE V048** **£19.99**  
 Running time: 91 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**KORG PROPHECY VIDEO MANUAL**

Written by Phil MacDonald  
 Korg's new Prophecy Synthesizer now has its own video manual!  
 This video covers all the major features over 6 sections, with lots of examples of the amazing effects that are available using the 'log' and 'mod' wheels. The video's visual interest is maintained by the extensive use of Chroma Key and multi camera effects. This is a video that is ideal for new owners, and those who want to know more about the Prophecy before they make a purchase.

**CODE V049** **£14.99**  
 Running time: 36 minutes  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**HOW TO GET THE MOST OUT OF HOME RECORDING**

**3 TOP CLASS VIDEOS**

*A superbly presented set of videos which no home recordist should be without. Have you got your set yet?!*

**LEVEL ONE**

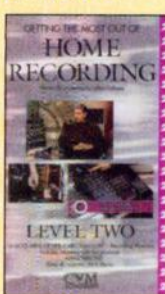


This well presented video explains how to set up and operate a simple cassette-based multitrack home studio. It clarifies all the basic terminology and demonstrates the recording of a song from beginning to end, covering

guitars, keyboards, vocals and drum machines; which microphones to choose; how to patch in effects units and use them; well; what makes a good arrangement; what makes a good mix; plus what to master on to and why. Full of professional tips and clear examples, this superb video offers the musician with no recording experience a fast route to successful operation of a simple home studio.

**CODE V005** **£24.95**  
 Running time: 1 hour 10 minutes  
 Format: VHS (PAL) HiFi Stereo  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**LEVEL TWO**



This is, in our opinion, the best ever guide to the equipment and skills needed to produce high quality results from a home studio. Full of clear examples and graphic information, the video majors on effects and how to use them well. It also covers the do's and don'ts of track

bouncing; microphones and mic techniques for different applications; getting the most out of multi effects units; plus an analysis of guitar effects with top session guitarist Julian MacDonald and an enlightening interview with ace producer Alan Parsons. Writer/presenter Julian Colbeck packs the programme with professional tips, allowing musicians of all kinds to get the most out of their home studio.

**CODE V006** **£24.95**  
 Running time: 1 hour 45 minutes  
 Format: VHS (PAL) HiFi Stereo  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

**LEVEL THREE**



This video is packed with information and professional tips on advanced MIDI applications in the home studio, including interfacing with sequencers, which sync code is best for which application and why. Hit producer Marty Phillips (Erasur,

London Beat) discusses modern recording techniques, and top programmer Paul Wiffen examines the opportunities and benefits offered by hard disk recording. It offers practical advice on sampling - how to save time and tracks; plus professional tips on advanced arranging and mixing techniques, including spectrum mixing.

**CODE V007** **£24.95**  
 Running time: 1 hour 30 minutes  
 Format: VHS (PAL) HiFi Stereo  
 Postage: UK £1.75, Europe £4.95, R.O.W. £6.95



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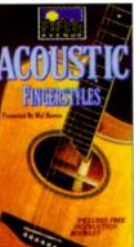
### KORG X5 SYNTH



Korg's new X5 synthesizer, reviewed in SOS' January 1995 issue, now has its own video manual. Presented by Tim Walter in an entertaining and lighthearted manner, and explains all basic aspects of Korg's highly affordable instrument in very clear terms. If you're in any way daunted by your new purchase, or want to get a feel for the instrument before laying out your cash, this is the video for you.

**CODE V027 £19.99**  
Running time 55 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### ACOUSTIC FINGERSTYLES



Presented by Mel Reeves  
In this video there are 5 major instrumental studies to work through including country, classical and blues. Each style is broken down into small sections allowing you to learn more quickly and efficiently. Each piece is demanding, but great fun to play. The final section looks at styles and techniques used by players such as R.E.M., The Eagles, Sheryl Crow and Paul Simon, and provides an insight into creating new and interesting fingerstyles of your own.

**CODE V059 12.99**  
Running time approx 90 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

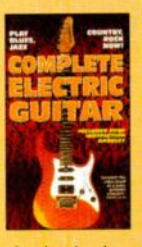
### ANALOGUE HEAVEN



Remember our feature on the opening day of the Museum of Synthesizer Technology which we ran back in October 1994? Wish you'd actually been able to attend? Well, now you can have the next best thing: the museum has released a fascinating 50 minute promo video that features footage shot on the day as well as a lightning tour of the facility. The programme is hosted by SOS contributor Julian Colbeck. The tape opens with synth pioneer Bob Moog making the inaugural speech and officially opening the museum, followed by a nostalgic run through one of his old modular systems. Analogue Heaven makes diverting viewing for anyone interested in vintage synths, represents good value, and offers the perfect companion to the Museum's guide book, also available from the SOS Bookshop.

**CODE V026 £12.95**  
Running time: 50 minutes Format: VHS (PAL)  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### COMPLETE ELECTRIC GUITAR



Presented by Mel Reeves  
Learn how to create solos and rhythm parts in any style! The programme covers ROCK 'n' ROLL, BLUES, JAZZ, COUNTRY, ROCK and FUSION and much, much more. Plus the clearest possible guide to chord and scale construction, tonal centres and working out parts for yourself. Includes free construction booklet.

**CODE V050 £12.99**  
Running time approx 65 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### PLAY BLUES NOW!



A complete guide to blues guitar playing that shows a variety of blues rhythm and soloing styles — for both beginners and advanced players alike. Learn the blues style of Eric Clapton, Stevie Ray Vaughan, Peter Green, etc. The programme not only covers the usual blues shuffles and scales but using 4 complete songs, gives you the resources and techniques to create professional blues parts and solos in a wide variety of blues styles.

**CODE V051 £12.99**  
Running time approx 50 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### KORG X3

This video offers an easy way in to this powerful workstation. It starts from absolute basics, including audio connections and volume levels, and the clear and helpful script covers all basic facilities of the X3. The video features a sophisticated use of picture in picture, with the X3's display cut into the main image to show you clearly what Phil is actually doing, and main points are reinforced with on screen text and graphics. The main section headings are:

- X3 Audio Connections • Getting Around the X3
- Factory Disk • Disk Drive Modes
- Selecting Sounds • Global Modes • Sequencer Mode • Quick Sound Editing
- Playing MIDI Files on the X3 • Using the X3 with an external sequencer

Note that these are loose headings, with each section also containing information on connected subjects in varying amounts of detail. A lot of ground is covered, and we can recommend the tape to any X3 owner.

**CODE V018 £19.99**  
Running time: 55 minutes Format: VHS (PAL)  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### GETTING THE MOST OUT OF THE KORG M1



Written and presented by Julian Colbeck  
The Korg M1 is a classic instrument. The range and quality of its sounds has made it one of the most successful synthesizers of all time. But because the M1 is so immediate, it's too easy just to scratch the surface, leaving many of its exciting capabilities undiscovered. This highly informative video enables M1 owners to unleash the full creative potential of this enormously powerful workstation. With plenty of musical examples, tips and inside information, the video offers clear, concise explanations of the instruments features and operating procedures, helping you to greatly expand your dexterity and creativity across the whole range of this world-beating instrument.

**CODE V002 £24.95**  
Running time: 1 hour 10 minutes Format: VHS (PAL)  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95


### COMPLETE ACOUSTIC GUITAR

Presented by Mel Reeves  
Whether you only know a few chords, or are already proficient, this easy-to-follow programme will show you all of the main guitar styles, as performed on the acoustic guitar. As well as learning tips and 'tricks of the trade' Mel Reeves will show you 6 great instruments, step-by-step and 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, Suits En Moscow, Classical, Romance, Carter Style, Buffalo Gals and Bottleneck/Slide Style.

**CODE V056 £12.99**  
Running time approx 78 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### ROLAND JV-90 SYNTH



Roland's JV-90 synthesizer gets the treatment in this informative Labyrinth production. Virtually every facet of the JV-90 is covered, from the basic functions to more advanced programming. Chris Allen guides you through the powerful features this instrument has to offer. Produced in association with Roland UK & USA to ensure that everything it contains is accurate, and relevant to new and more experienced users alike.

**CODE V044 £19.99**  
Running time 70 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### PLAY HEAVY METAL NOW!



A concise, easy to follow video guide to real heavy metal playing for guitarists of all levels. A guide to hard rock/heavy metal techniques for guitarists of all levels. The programme covers RHYTHM, SOLOING, and TECHNIQUE. All of the techniques, solos, etc are clearly demonstrated. No need to read music. Free booklet contains tab, chord and scale diagrams.

**CODE V052 £12.99**  
Running time approx 65 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### YAMAHA QY20 MUSIC SEQUENCER VIDEO MANUAL



by Tom Robinson  
Yamaha's popular QY20 portable sequencer/sound source is a deceptively simple device to use; if you think you might like some insight into getting that little bit extra out of the device, then look no further. Produced in co-operation with Yamaha, the video features mobile musician Tom Robinson showing you how to get the best from this portable marvel. Tom, who has used the QY20 extensively as a writing tool on the road, says: "I never leave home without it".

**CODE V016 £19.99**  
Running time: 90 minutes Format: VHS (PAL)  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### PLAY KEYBOARDS NOW! MELODIES

Presented by Mel Reeves  
This programme will not only teach you note reading, rhythm, rests, ties and how to move up and down the keyboard with ease, but will also teach you 6 complete melodies familiar to lovers of rock, pop and classical music. In addition, there is a further look at improvising, making use of melody and scales combined. Clear computer graphics and the booklet enclosed will mean you won't miss a thing.

**CODE V057 £12.99**  
Running time approx 55 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### THE EMAGIC LOGIC TUTORIAL VIDEO VOLUME 1



Produced by Emagic themselves, this video once again sees Tim Walter (featured on the excellent Notator video) in the tutor's chair. There are plans for a series of videos which become ever more detailed and informative, but for now Volume 1 takes you through the first steps of getting the software up and running, and covers virtually all the controls you'll need. This video is valid for all versions of Logic, whether being run on an ST, Mac or PC. Presentation is rather intriguing, with a mobile camera that helps to hold the interest more than the average training video and some interesting graphics that aid comprehension and help to quickly find specific tutorials and bits inside tutorials. Contents as follows:

- Tutorial 1: The Arrange window and basic sequencing
- Tutorial 2: Playback parameters & Toolbox
- Tutorial 3: Controlling MIDI data flow
- Tutorial 4: Manipulating sequence data
- Tutorial 5: Moving around in Logic
- Tutorial 6: Windows and key commands
- Tutorial 7: More sequencing
- Tutorial 8: Score
- Tutorial 9: Looking at the Event List
- Tutorial 10: Editing the Event List
- Tutorial 11: Using the Environment
- Tutorial 12: The best of the rest (HyperEdit, Matrix Editor, Cycle Mode and more).

**CODE V023 £29.99**  
Total running time 70 minutes Format: VHS (PAL)  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### PLAY GUITAR NOW! ACOUSTIC & ELECTRIC



An easy-to-follow video to take you from the basics to a full rock solo. The programme covers TUNING, CHORDS, FINGERSTYLE, 12 BAR BLUES, BARRE CHORDS and ROCK SOLOING for both electric and acoustic guitars. Includes free chord/tab booklet. It is not necessary to be able to read music to learn from this video.

**CODE V053 £12.99**  
Running time approx 51 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### ACOUSTIC BLUES GUITAR

Presented by Mel Reeves  
Whether you can already play fingerstyle guitar, or are simply familiar with basic chords, this programme will show you all of the necessary techniques to play great blues guitar. All of the technical aspects are explained in the clearest possible way before getting down to the real business of learning 5 real blues that are great to listen to and terrific to play.

**CODE V058 12.99**  
Running time approx 63 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### PLAY KEYBOARDS NOW!

Presented by Mel Reeves  
An up-to-date video/booklet that gets to the heart of modern keyboard playing with no need to read music! All you need to be able to create pop, rock and even jazz chord accompaniments using major, minor, seventh, sus 4th and added 9th chords. I learn arpeggios, random arpeggios, chord 'splitting', crushed tones, boogie blues, inversions and much more. Free instruction booklet and stickers included.

**CODE V054 £12.99**  
Running time approx 60 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### START HOME RECORDING NOW!



This is the ideal volume one guide to the use of home recording equipment. From the set up of basic 4-track cassette machines to sub-mixing Mel Reeves uses straight-forward language to talk to fellow musicians about the methods used to get the sounds in their heads onto tape. Includes free instruction booklet.

**CODE V055 £12.99**  
Running time approx 55 minutes  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### YAMAHA QY300 VIDEO MANUAL



Complete overview of Yamaha's new QY300 sequencer/sound source. Presented by Joe Ortiz of Heavenly Music, the video offers a hands-on tutorial on what is potentially a very powerful piece of hardware. Starts off with a runthrough of QY300 features, followed by a clear, step-by-step tutorial that introduces you to creating your own sequences and styles. As a bonus, the video comes with a free disk loaded with 6 new QY300 styles and 6 demo sequences.

**CODE V025 £19.99**  
Running time 69 minutes Format: VHS (PAL)  
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95



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CODE CD036 £32.95

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## SOUND CHECK CD II NEW



Recorded & compiled by Stephen Court & Alan Parsons. Sound Check has become an international reference for producers, musicians and sound designers. The new version

features all the test signals and reference recordings (made at Abbey Road Studios) of the original - including pink noise bands, 1/3rd octave bands, sine and square wave spot frequencies, sweep tones and SMPTE timecode utility tracks - plus some new operative vocal and music items, to a total of 99 tracks. The major innovation offered by Sound Check II is that it is available in a special package that features a built in mic and spectrum analyser, for use with the CD's 1/3rd octave tracks. The package is thus a compact and convenient method of measuring frequency response, whenever and wherever you may need it.

CODE CD038 SOUND CHECK II £28.99

CODE CD038S PLUS SPECTRUM £73.50

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# SOS Quality Cables

Due to the popularity of our range of affordable eight-way cable looms, SOS Mail Order can now offer you even more products in a similar vein. All cable is manufactured to the same high quality as the looms, and prices are once again excellent. Whatever your cable needs, you should find something in our list at a price that's right.

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### 20ft MIDI cable

Code MID320 £6.70

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Code STP201 £4.50

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### Stereo jack to 2X mono female socket adaptor

Code YPP117 £3.40

Postage: UK £1.75, Europe £3.50, R.O.W. £3.75

### MIDI female - MIDI female adaptor (joins two MIDI cables)

Code GMD108 £3.49

Postage: UK £1.75, Europe £3.50, R.O.W. £3.75

### Musician's Home Stereo Interface

If economic necessity means that you've got to use your hi-fi system for monitoring, then this affordable little box is for you. It simply matches the output of your mixer or synth to your hi-fi, and features three switchable inputs for maximum flexibility.

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## VOICE TRAINING



### VOCAL WORKOUT Video

by Sam West. Singers of varying abilities will find this video a great aid in assisting their vocal efforts. It begins by explaining the principles of voice production. Breath control exercises plus general vocal techniques are all explained and visually demonstrated. All the exercises are written out in an accompanying booklet, with piano accompaniment.

VIDEO CODE V067 £22.95

Running time approx 59 minutes

Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

### VOICE BUILDING Cassette/CD

by Sam West. Although geared towards singers of varying abilities, voices and styles, the contents of this recording are often challenging even to the professional singer! The video (code V067) goes into more technical detail, whereas the CD or Cassette concentrate on more intensive practising. First of all the exercises are sung, in various keys and then with musical accompaniment and melody line, so you can concentrate more on your voice while practising (karaoke style).

Vocal exercises can be boring, but this studio recording has been produced and presented to a very high standard, with interesting musical accompaniments to the exercises.

CASSETTE CODE MC001 £6.95

CD CODE CD037 £9.95

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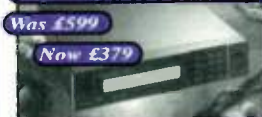
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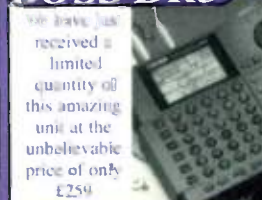
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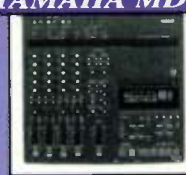
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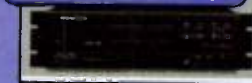
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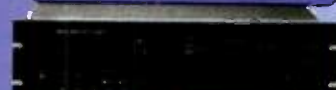
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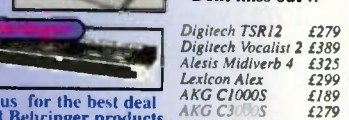
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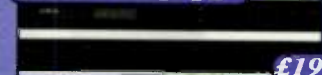


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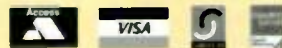
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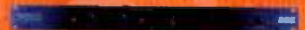
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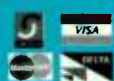
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Check out our updated web site if you get the chance. Ritchie Court the man in Rio behind our T. Beats Brazilian disk, decided that a little updating was required to sort out some missing accents on the Brazilian info. While he was at it he decided to re-do the whole site. We think it's pretty cool. There are demos of all the volumes available as well as snippets of reviews too. Thanks Richie



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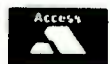
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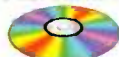
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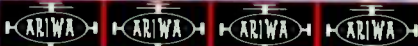
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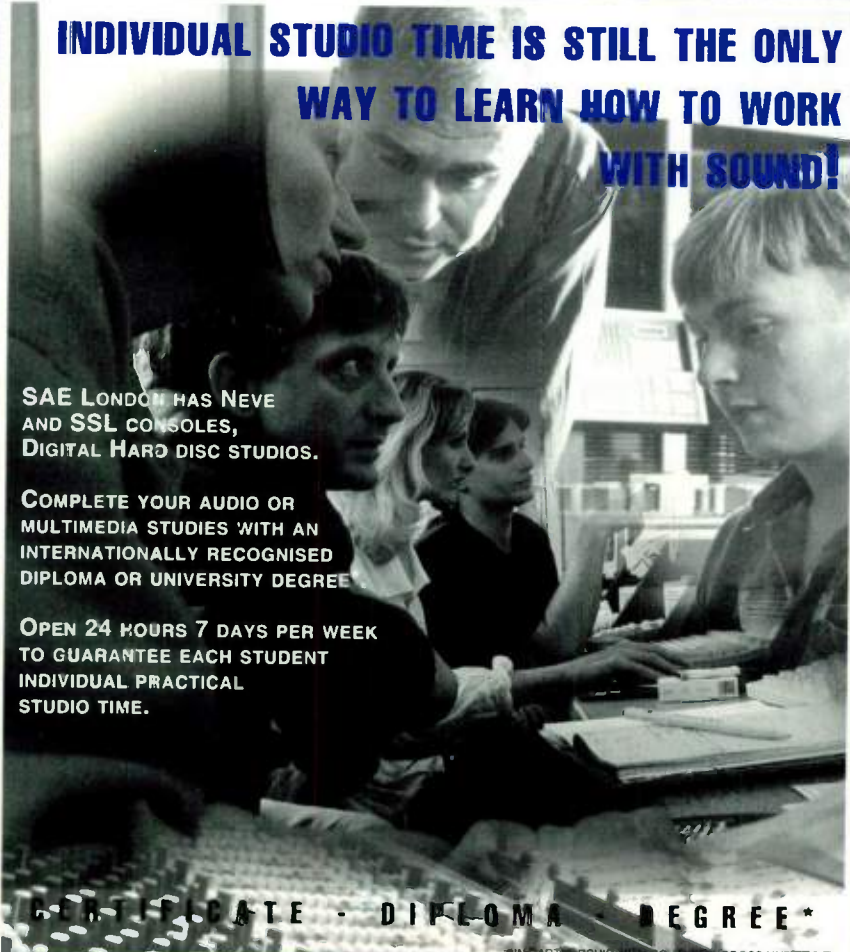
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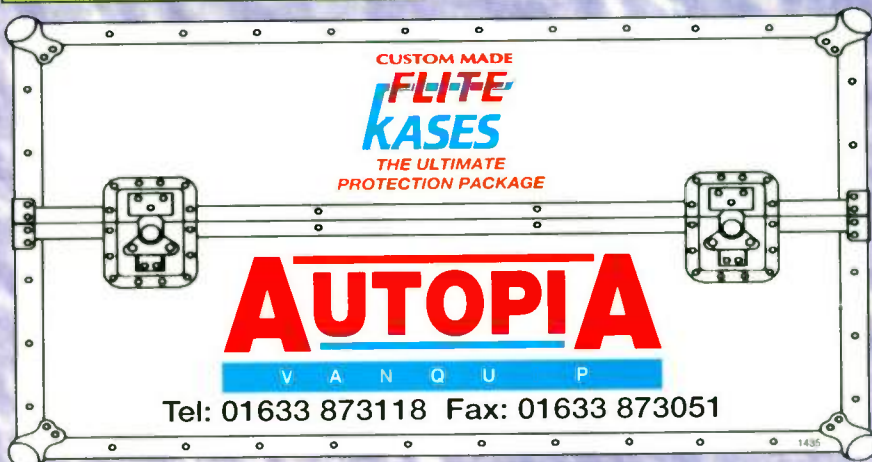
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# sounding Off

**Musicologist  
and composer  
BIG GEORGE  
wonders "Is the  
Big Apple of pop  
music rotten to  
the Core?"**

**H**ow come, no matter what part of the country you find yourself in, the same records by the same tedious artists seem to be played on every single independent local radio station? You know the acts I'm referring to — they're the same ones who have eight-foot cardboard window displays in high street record retailers promoting their latest albums. The reason for this uniformity is that they're all in a bracket known inside the industry as 'Core Artist'. Or, to put it another way, safe, bland, easy-listening tripe. And just who picks these artists?

Well, far be it from me to suggest that there's a conspiracy involved, but did you know that over 90% of all national local radio stations are run by three huge, tone-deaf, advertising-hungry companies? These stations are playlisted from head office by one person, who has the power to dictate the music listened to by the entire country.

On average, a weekly playlist is made up from less than 250 records, 40 of which are on an 'A' list. These lucky records will get played about five times a day. The running order is chosen by a system called 'Selector', which scientifically programmes the order of a show; that same running order will be used on all stations nationwide.

It's also a sad fact that all local disc jockeys are not only told what records to play, but what to say as well. After every three-record sweep they must say who the artist was, in reverse order (they don't have to say what the track was called and are forbidden to make any comment on the artist or say what album a track was taken from, unless it's a movie soundtrack). It is a sackable offence to speak after an ad break and at least once an hour they must give a scripted station ident, usually something like "You're listening to the all-new FM 123 Bland, where we give you much more music and we've cut the chat".

What they don't tell you is that the records they're playing are probably the boss' wives favourite artists, and the rubbish jokes the DJs are contracted to find so amusing are faxed to all DJs simultaneously across the country. Independent Local Radio wants only one thing: advertising. They're not interested in quality output or local involvement, just more money in their coffers. In fact, apart from the barest minimum of local events being announced on-air free of charge, everything you hear, apart from the records, is paid for. So when you hear of a concert being sponsored by 'FM 123 Bland', it means that they have been paid thousands of pounds to promote it — even local festivals can cost the organiser £6000 for the privilege of a

few mentions on-air and a banner up at the event.

So why is it that people still listen to local radio? There's an organisation called RAJAR, who survey listening habits a couple of times a year. They are an opinion poll company who estimate the listening figures stations use to attract more advertising. These figures are the only source used to judge the number of people listening, and we all know how accurate opinion polls are. You'll know when the RAJAR people are in your area — it's at about the same time as your friendly local radio offers to give you money if someone asks you what station you listen to. To hammer that point home to the 'Plebs' (their term, not mine) who listen, they pledge to double the cash if you have the name of the station written down. Strangely, neither RAJAR nor the Radio Authority monitor whether money is actually being given away to ordinary members of the public. Of course, you'll hear lucky winners saying how great the station is, as they win money. Amazingly, the lucky winners always seem to be working at a private clinic or car showroom. Of course, this is only coincidental and not illegal product placement.

And obviously the fact that these instant prizes are completely unregulated never leads to a winner being a member of staff who doesn't speak on-air, or a DJ's partner — or does it? These are all devices to inflate the listening figures and attract more advertisers. As long as you can show the friendly advertisers that an ever-increasing number of the population is tuning to the most watered-down radio on the planet, you can charge more for the ads, whether the figures are accurate or not. There's no less than 10 minutes of advertising an hour, as well as station idents, news, travel and weather bulletins, and the meaningless banter of a DJ telling you that they've "cut the chat and given you more music..."

That's why local acts never get played on daytime radio any more, because there is no local responsibility to provide a service to the public. In fact, a good deal of the overnight and weekend output of most local stations is networked from head office, which can be over 400 miles away. Or as one company logo puts it: "Local Radio, Nationwide".

Personally, I could forgive them all of this if they did just two things. Firstly, give daytime airplay to local contemporary musical talent. Every town has at least half a dozen bands and singers who are every bit as good as the top bands of the day. Every hit band was a local band once.

The second thing is to bring back specialist evening shows. There was a time when local radio excelled in nightly 2-hour long shows dedicated to the likes of Reggae, Country, Rockabilly, and so on, presented by people who knew about the music they played and informed the listener.

Sadly, the more local radio becomes the preserve of a couple of major public companies, the less it has to do with music. As for what's wrong with BBC Radio 1 and 2, maybe some other time.

SOS

*If you'd like to air your views in this column, please send your ideas to: Sounding Off, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.*



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