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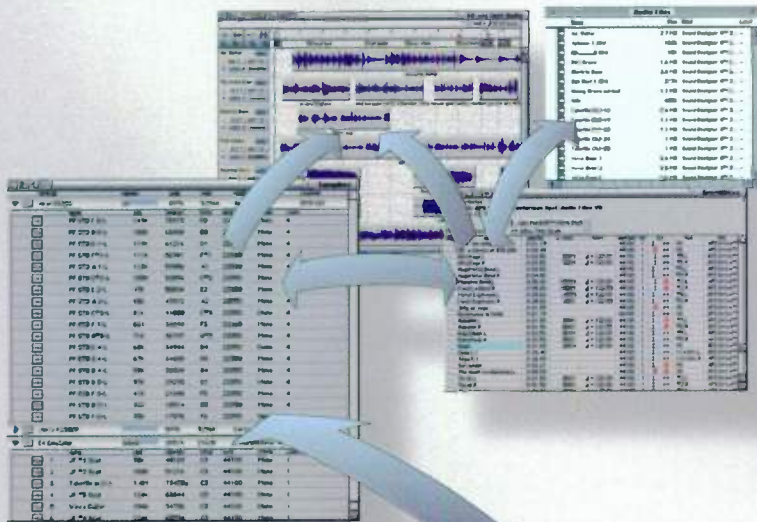
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I always enjoy writing these leaders, and never more so than when I can have a really good moan about something, but the theme of this month's SOS is physical modelling, and it's difficult to be negative about what is probably the most exciting development in electronic music since the 13-amp plug. However, I'll do my best not to disappoint!

Since synthesizers first appeared, musicians have constantly sought newer and more interesting sounds, but as soon as the love affair with the latest synth module or sample CD wears off, the search resumes — we rarely settle on anything that's entirely satisfying, even if it comes with 1000 presets and a free disk of 1000 more. The orchestral composer, on the other hand, is able to compose an infinite variety of music while drawing upon only a handful of different instrument types. Why is this? Sounds are important, it's true, but they're not as important as you might think. What is more important is that musical instruments should behave musically, and that applies as much to electronic instruments as it does in the traditional world.

The problem with conventional synths is that you can make them louder or softer, you can add vibrato, you can bend the notes, and you can even tweak the filter characteristics, but they don't really respond with anything like the flexibility or feel of a 'real' instrument. You just have to listen to a moodily played saxophone, then compare it with a sample, to see that no matter how good the sample, or how well played it is, it doesn't come close to the real thing.

Of course, this is where physical modelling is supposed to help out and, from my own experience of it, it's definitely a major step in the right direction. A few months ago, Yamaha were kind enough to loan me a VL70m, an affordable physical modelling module that majors on wind sounds, and it's taught me a lot — though not how to hang onto it indefinitely without getting an invoice! To get the best out of it, you have to use a breath controller (and put up with the ensuing pool of drool on your lap), but it really does go a long way towards putting the feel back into what is inherently an electronic caricature of the real thing. I dare say

that a static sax note played on the VL70m wouldn't be as convincing as a good sample, but that doesn't matter at all — what matters is that when you listen to a performance where the performer is truly interacting with the instrument via a breath controller, or other suitably tactile device, you can easily imagine that you're listening to a real person playing a real instrument. It's an emotive experience, not a polyphonic musical door-chime.

Now we have the promise of more affordable polyphonic modelling synths. Modelling is already being used to emulate old analogue machines, but it's my belief that the monophonic ones will always sound best, just as analogue monosynths sounded better than their polyphonic descendants. It's not that you can't get the same noises out of a polyphonic instrument, it's more that you can't control them as well as you can a single note. When you think about it, virtually every truly expressive instrument, other than the guitar, is monophonic, and even the symphony orchestra is composed mainly of monophonic instruments. Pianos, organs and harpsichords have very limited means of expression, which is why the MIDI imitations can be made so convincing, but how often have you heard a credible imitation of a solo violin, sax or flute, let alone the didgeridoo? No, the most expressive instruments demand that their player put far more effort into the 'performance and control' aspects of their instrument than simply hitting the right note, and if our electronic equivalents are to have as much feel, then we must be given the means to do the same.

I know that many people will disagree with me (what other point is there in writing leaders?), but I really believe that the introduction of the first commercial polysynth changed the analogue synthesizer from an expressive, exciting instrument to little more than an organ patched through an auto-wah. It would be tragic if polyphony were to do the same for physical modelling.

Paul White Editor



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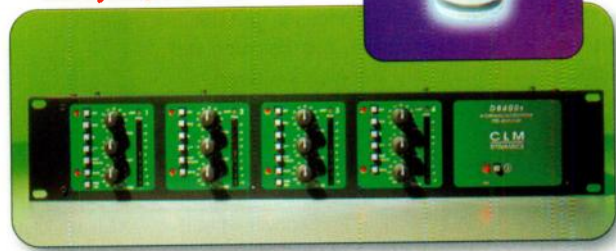
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Saved By The Mac

I have a Roland MC4 Microcomposer and have devised a quick and efficient method for saving the machine's data using my Apple Mac Centris 610 (I haven't tried any other Mac models). I simply connect the tape in and out sockets of the MC4 to the Centris's audio input and output, using quarter-inch jack to 3.5mm jack leads, as if the Centris were a tape recorder. Save, Load and Verify are then done using a Mac sound recording utility. These tasks still take the same amount of time as tape, but I now have a convenient way of cataloguing my MC4 programs. I can also associate text and graphic files for the extra info on MC4 CV/Gate/MPX channels, and any other helpful info for when I go back to programs.

Viewing the MC4's saved data on the Mac is interesting, too, using the spectral analysis tools supplied by many sound packages. I've found it best to limit the spectrum view to between 1.2kHz and 3kHz, which seems to be the frequency range of the data output. It is then quite easy to home in on the start and end of the actual data.

A short program on the MC4

doesn't take too long to save, anything from 10 seconds up to a minute or so, although for longer programs it's difficult to say. With the problems of large sound files in mind, I tried a few compression experiments — different sample rates and compression algorithms, always at 8-bit sample resolution. This was sufficient to compress an 884K file to 162K, and it still loaded fine.

I don't know if this would work for the MC8, as I don't have one. In fact, I picked up the MC4 after reading Chris Carter's retrospective of the MC8 in March's SOS. I spotted an MC4 for £100, plus shipping, in SOS's Readers' Ads; it arrived in mint condition, with manual. I hooked it up to my modular system and started ploughing through the manual. Yes, very cryptic and full of assembler language, but not unfathomable, and the command summary at the back is good. Flipping between text and summary enables decryption of the relevant information. I was particularly gratified by switching on a machine that knows what it does: within a second of power being applied, the machine functions as a sequencer, not a

personal computer with all its associated (mal)functions.

Dave Burraston
Woodbridge

Chris Carter replies: *Initially, I was both intrigued and a little sceptical about this technique, so I thought I would investigate. Using Dave's methods, I tried saving some ancient Roland MC8, Roland TR505 and*

recommended 8-bit, 22kHz, MACE 6:1 compression settings, and as either AIFF or QuickTime self-contained format audio files. Using the QuickTime format means that, in theory, anyone with QuickTime installed in their system can play back the files, be they Mac or PC users. The only hitch I came across was when RAM Doubler or virtual memory was enabled: it sometimes



The MC4 — no longer any need to tangle with tape archiving.

Akai MX73 programs into various Apple Macs — a Quadra 660AV, a Performa 6200, a PowerBook 145B and a PowerMac 7600 — and, with some slight adjustments, the process worked fine with all of them. As an example, an old monster MC8 program that took 10 minutes to save or load only took up 1.9Mb of disk space, while an 80-second MX73 save was 300K, and a 45-second TR505 dump occupied just 135K. I then tried compressing these files by another 70%-75%, and as compressed self-extracting archives, they became 612K, 70K and 43K respectively: all reloaded without a problem.

Regardless of which program the data is recorded in, shareware or commercial (I recorded with SoundEdit and Cubase VST), I got the most consistent results if the files were compressed and saved in QuickTime format, using Dave's

interrupted playback of the QuickTime audio signal, causing reload errors. As a precaution, make sure you 'verify' any data before you throw away those old cassettes!

Data files this small and manageable become the ideal size for sending over the Internet or archiving to floppy disk, and are certainly a lot easier to deal with than cassettes. Anyone still using this near-obsolete type of storage — and that includes old Spectrum and Commodore computers — should try this moderately straightforward and extremely useful technique.

In fact, it works so well that I spent a weekend transferring old and decaying cassette saves into my Mac for much safer and more reliable archiving. Dave should be congratulated for this brilliant example of lateral thinking. I only wish I'd thought of it myself years ago! □

MIDI & Audio Don't Mix

We read with interest Paul Lennon's letter, in July's SOS, about audio clicks resulting from MIDI data. We had — still have, to be honest — this problem in our studio. The clicks are leakage of MIDI data into an audio line. To solve a cabling problem we put MIDI down two separate unbalanced cores buried in a floor and simply connected them to the DIN plugs either end — yes, we know it's bad practice, but needs must. The clue is the mod and pitch-bend noise. As they are continuous controllers, they

send a series of clicks as you move them. The actual MIDI stream is also audible as a low-level buzz. What seems to happen is that the initial burst of setup data at the start of each sequenced track fires off very quickly and creates a loud 'zip' sound first, with the more gentle amounts of MIDI data used for the song being masked, to a certain degree, by the sounds themselves.

Moral of the tale — keep MIDI and audio very, very separate.
Paul Johnson
Great Yarmouth College □

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Crosstalk

Are You The Keymaster?

I've installed Steinberg's *Cubase v3.0* for Windows on my PC, including the copy protection key. My printer is plugged into this key. My problem is that when I go to open *Cubase*, I get a message that the protection key hasn't been detected. In the *Getting Started* booklet that comes with the software, it notes that the parallel port (used by my printer) is bi-directional, and that the computer has problems recognising the key,

and asks that the port be switched to its compatibility mode.

It will be obvious that I'm not terribly into PCs, but does this advice apply to me, and if so, how do I alter the port mode?

Gerry Feighan
Co Armagh

Derek Johnson replies: A quick call to Steinberg distributors Harman Audio reveals that there are two

potential issues here. The first has to do with the way *Cubase* is currently distributed: basically, when you buy the software, you get a CD-ROM, and it contains all versions of *Cubase* — Score, Audio and so on — but you can only install the version you paid for. Install the wrong one, and your key (or master disk for Mac users) won't work.

The second possibility might be a problem with your printer port; the actual specifics vary from machine to

machine, but basically, when you boot up your PC, you'll have a chance (during DOS boot-up) to press a key — it can be F1 — that takes you to a setup page. Details again vary, but this page should have an option for setting up your communication port: change its setting to 'standard' or 'compatibility' mode. Check your computer's documentation first, and of course you can contact the Steinberg team at Harman on 0181 207 5050. □

If Noise Annoys

I have a 486 DX2/100 PC with 24Mb of RAM, and a Turtle Beach Tahiti sound card with DB50XG daughterboard. There's a very annoying erratic problem with my system that sounds as if it's static, digital clipping or interference. I record a WAV file using Steinberg's *WaveLab Lite* or *Cubase Audio*, at the correct levels. When replaying the WAV file, it sometimes plays back cleanly, but at other times I get a sound like vinyl record scratches or worse. The problem doesn't seem

occurring in time with hard disk movements. Could you offer any advice?

Ben Makepeace
Dyfed

Martin Walker replies: Clicks and pops with soundcards are a recurring problem for some people. They may be caused by various things, but thankfully your letter is detailed enough to narrow this down a bit. The big clue is that the same WAV file sometimes plays back cleanly, and at other times displays rhythmic interference in time with the disk drive. I had exactly these symptoms on my previous 486 machine after I installed Windows 95, but they disappeared when I upgraded to a Pentium. Windows 3.1 is more tolerant of slower machines, but this is no consolation if you have already upgraded to Windows 95.

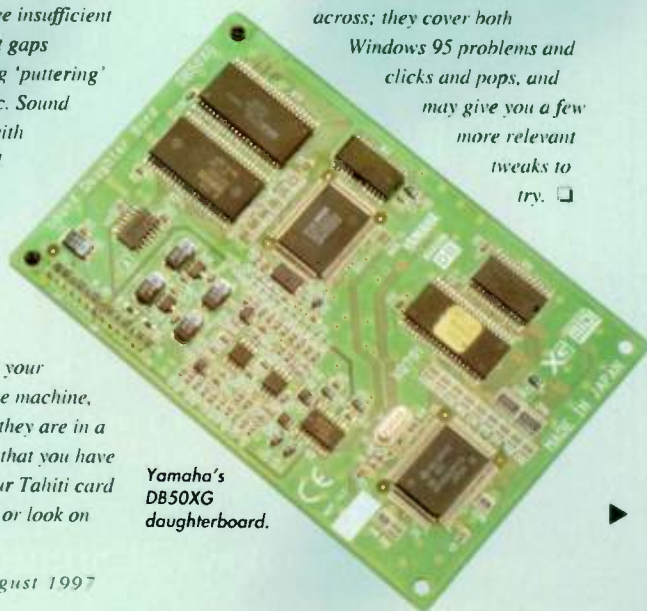
On my 486DX33 VL-Bus machine, *Cubase Score v2* needed 70% of the processor time just for running typical MIDI files, and when I got *Cubase Score v3*, this rose to 90%, making it incredibly sluggish. Your machine is a bit faster than mine was, but you probably get the picture — running audio as well will probably tip the balance, and the hard drive may have insufficient time to keep up. This results in slight gaps between each playback read, causing 'puttering' that can sound remarkably like static. Sound files which can sit in memory (and with 24Mb these might be quite long) will probably be fine, but you may get clicks as soon as the hard drive starts to load new sections of a longer sound. However, you may just scrape through if you can optimise your other settings.

First of all, regularly defragment your hard drive — if you have a borderline machine, it may only manage to replay files if they are in a single block on the drive. Make sure that you have the latest Windows 95 drivers for your Tahiti card (contact Et Cetera on 01706 228039 or look on

their website, <http://www.etcetera.co.uk>), since some manufacturer's early Windows 95 drivers were prone to recording clicks and pops. Try setting your Tahiti base address to E800 if this causes no conflicts with other hardware, as this apparently helps cure some noises with Turtle Beach cards.

Another area to look at is I/O buss speed. All ISA cards are designed to run with an 8.33MHz setting, but many will work at higher speeds. Better overall performance could be had from many 486 machines by increasing the I/O speed slightly, but often soundcards could not keep up. The setting to check can be found in your BIOS as something like 'AT I/O Bus Speed: CLK2/x', where 'x' can be changed. For your machine, the actual motherboard clock speed is 50MHz, so the buss speed should be set to 6, giving 50/6, or 8.33MHz. If you find it currently set to 5, for instance, the buss will be running at 10MHz — a boost to PC performance, but possibly causing problems for the Tahiti. Finally, if you have access to the web, try looking at the IQS (SAW) site (<http://www.iqsoft.com/>), since this has one of the most comprehensive sets of technical

documents that I have ever come across; they cover both Windows 95 problems and clicks and pops, and may give you a few more relevant tweaks to try. □



Yamaha's DB50XG daughterboard.



Turtle Beach's Tahiti card.

to be connected with amplitude — quiet, non-clipped files exhibit the problem as often as higher-amplitude files. Because the problem is erratic, using tools (such as 'invert' or 'snap to zero') have no effect.

I run the system off a stage 2 surge- and noise-protected socket; I've got Windows 95 and optimise all settings to run *Cubase* glitch-free, as per the manual's instructions. The card is separated from anything else by an empty slot, and there are no MIDI problems, so I'm sure the daughterboard is OK. Is it possible that my Tahiti has a fault? I've had it for a year. Someone suggested I re-install all my software, but since I have the same problem with *Cakewalk 5* I can't see how this would help. It sometimes feels like a static build-up, and occasionally there's a rhythmic interference



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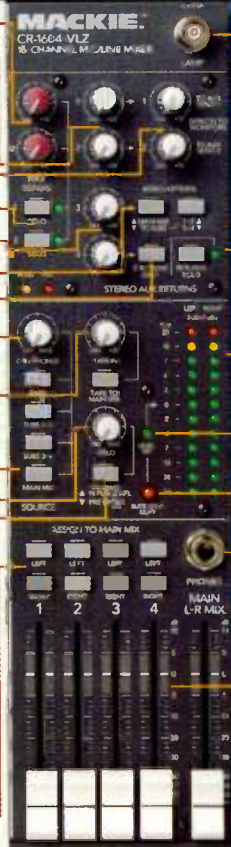
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Crosstalk

Stand By Your Store

I wonder how many people reading July's *SOS* can identify with Judy Lemon's *Sounding Off*? After several similar — though not quite so nerve-racking! — incidents, I decided to find a music retailer I could build a good relationship with and stick with them, in a similar way that I do with my current Macintosh retailer. No need to ring around all the adverts chasing your own tail, no "call us last, sir" statements so that everyone can beat everyone else's prices out of existence. The bottom line to the customer (us) is that lower margins invariably means lower quality of service, to a point where shops then become box-shifters to survive: once you're out of the door, they *have* to move on to other customers. Buying from the same place also has other advantages. They're more likely to give you the benefit of any special deals they might get from manufacturers, or bend over backwards to help with important rush orders you need. Also, if you have the right attitude, this relationship can run both ways — I occasionally receive technical queries regarding Mac systems from my retailer. Would the more 'well-known' retailers be bothered with this kind of relationship? I doubt it.

I can provide an example from the hi-fi world. The Cornflake Shop in London is regarded as one of the best hi-fi shops in the country, yet they openly tell new customers that they give no discounts but their service is exceptional, arguably second to none. With the level of complexity of some new musical equipment increasing from frightening to overwhelming, support for most customers is a must. Thankfully, over the past few years I've been buying from my supplier, I've had few problems, though any that I have had have been dealt with quickly and efficiently.

So, as Judy's last line suggests, it really is up to us. Is it worth paying slightly less for a piece of gear just so that you can buy a few extra pints down the pub? Or is peace of mind worth this additional expense? I know where my money will be going...

Mike Best
London ☐

They're Working On It...

I am pleased to see that *SOS* is getting bigger and better by the month. I have just received the July issue, in which you are covering PCI audio cards. We receive a lot of phone calls regarding Emagic's Audiowerk 8 and compatibility with *Cubase VST*, and I would like to make the following comment on the subject.

As part of the application, *Cubase VST* hosts a Steinberg technology called ASIO (Audio Stream Input and Output), which is a communication layer between the core application and any external hardware. Steinberg welcomes the development of ASIO drivers by different hardware manufacturers which allow their products to interface directly with VST. No license fees are involved in developing ASIO drivers for VST.

This technology is already supported by manufacturers such as Digidesign, Lexicon, Korg, Lucid Technology and more. A recent example is Korg's 1212 I/O PCI card, reviewed in July's issue, which provides VST with 12 simultaneous ins and outs via an ASIO driver developed jointly by Korg and Steinberg.

In this light, Steinberg would welcome an ASIO driver developed by Emagic, further extending the concept of open-ended technology already established by many other manufacturers. I understand that Emagic are writing a standard Windows driver which will allow *Cubase PC* users to at least use Audiowerk8 as a digital/analogue stereo I/O card. We have confirmation, however, that Event Electronics will be supporting *Cubase VST* with their new range of cards, giving *Cubase* users the same options as Emagic users at the same price.

I hope you find this information useful.
Niels Larsen
Steinberg department
Harman UK Ltd

Derek Johnson replies: *Thanks for your input, Neils. We at Sound On Sound have also been*



curious about this situation. Non-ADAT users, who may not be able to take full advantage of the Korg 1212 I/O's feature set without buying extra hardware, may be looking elsewhere for a PCI audio card for their PowerMac. Event Electronics' cards are, as of writing, not yet available in Europe, and many users would buy an Emagic Audiowerk8 right now if it were compatible with VST. We asked Sound Technology, Emagic's UK distributor, to comment. Dave Marshall of Sound Technology informs us that there will soon be a solution of sorts, especially for Mac users: new versions of the Audiowerk8 CD-ROM will include a new Sound Manager driver that allows two audio ins and eight audio outs for software (including Cubase VST) using AudioWerK8. PC users will have to make do with a new MME driver that provides a basic 2-in/2-out access to the card. ☐

Less Is More

I would like to comment on Paul White's June leader. Paul's said that timing could be badly affected by using sequencers, I'd say my timing has improved. This becomes particularly apparent when working with drummers with erratic time-keeping. Improved time-keeping may not always be beneficial, but it's made me appreciate tight drummers (who also seem to be the ones with restraint and 'taste').

I'd also like to comment on Ian Stewart's June *Sounding Off*. His description of a '70s keyboard

rig reminded me of early bands: dodgy electric pianos, cheap organs and early synths. But these limitations didn't stop us from making music. For example, I don't know anyone with a Rhodes, but I have many Rhodes synth patches. I have several favourites, and can easily waste 10 minutes choosing between them. The same problem occurs with effects: my Boss pedals allow me to be more creative than trying to choose between a small room reverb or a slightly larger small room.

We look back in awe at the achievements of

The Beatles, the Beach Boys and Phil Spector and ask how they managed with the limitations placed on them. I think those limitations forced them to be creative and focus on what they could achieve. Our problem is that we're not very good at limiting ourselves. I believe one manufacturer's slogan was "accept no limitations", but perhaps we should re-word the slogan as "define your own limitations".

Keep up the good work.

Graham Owen
via email ☐

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Crosstalk

Suppressed Excitement

I've been using a Behringer Ultrafex II in my setup for the last year and have been quite happy with the results, but know from all the articles I've read on mixing that I don't have it patched up as I should — the more of such articles I read, the more confused I become! To be able to treat every channel separately, I have the Ultrafex II patched into two aux sends and returns on my Mackie CR1604, rather than on inserts. Although, as I say, I'm quite happy with the results, I don't feel I'm getting the full effect of the stereo



enhancement. As I am essentially looking for enhancement over the whole mix, would you advise patching it between the desk's outputs and my mastering machine, or is there a better solution? Also, if I do this with one channel of the Ultrafex II, could I still use the other channel in an insert point as required?

Thanks, as ever, for a brilliantly informative mag.
Craig Alexander
London

Derek Johnson & Paul White reply: *The only way you'll get the full effect of stereo enhancement would be to patch both channels of the Ultrafex II into the CR1604's master stereo insert points; this has exactly the same effect as patching the unit in-line with the desk's audio out, except*

that the enhance process won't be compromised if you want to do a fade using the console's master faders. If you need more control over individual parts, why don't you add a little enhancement while you're recording each part? This isn't ideal, since you won't be able to remove any enhancement later, but it might provide an alternative to buying more enhancers!

In general, I (Paul) prefer to use a stereo enhancer in one of a multitrack console's subgroups, then route just the channels that need enhancing via that subgroup. This technique won't be

available to you (the CR1604 lacks real subgroups), but it would allow you to create contrast between various elements in the mix, rather than enhancing everything.

Using the enhancer the way you're using it at the moment is a bit hit and miss, because you're adding both dry and enhanced signal to the original dry signal. If there are any phase differences between the channel signal path and the aux send/return, or any phase shift of the dry signal within the enhancer, you'll compromise the sound.

Furthermore, it sounds as though you're only using half of the enhancer, so the enhancement is being added in mono, which will narrow your stereo image rather than widen it. Check out the manual that came with the Ultrafex II, as that should explain all these factors. □

Tine For A Change

I am the lucky owner of a classic Fender Rhodes 73 Mk1, which is pure sex on four legs. Unfortunately, because I'm a bit of a basher, a couple of tines have snapped off. To fix them, I've taken tines from the bottom keys and cut them to the right length to replace the more 'useful' notes, but I can't go on doing this forever, as I will soon have to start playing with my right hand only!

Is there a UK supplier of spares for Rhodes pianos who would sell me a bunch of tines that I could keep in reserve? Thanks for your help.
Daniel
via email

Derek Johnson replies: *As it happens, you've written at an opportune time: there have been a few false starts on the Rhodes front lately, but, apparently, an enthusiast has*

obtained and revamped the original tools used to make spares for the Rhodes. So, whether you need tines, hammers, hammer heads, dampers and so on, they will be available imminently. Thanks to Panic Music's Mike Swain for the info. Incidentally, Panic (01954 231348) will be able to obtain, sell and/or fit these spares, and Mike reports that he has a contact who can also supply coil rewinds. □

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BIRMINGHAM	Q Music	0121-643 4655
BIRMINGHAM	London Microphone Centre (LMC)	0121-359 4535
BLACKPOOL	Tower Music	01283-27359
BOURNEMOUTH	Eddie Moor's Music Ltd	01202-395135
BRIGHTON	Rainbow Sound	01273-624048
BRISTOL	X Music	0117-9734 734
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DOUGLAS	Ken Mitchell Music	01624-611919
DUBLIN	Control Techniques Ireland (CTI)	003531-4534400
DUNDEE	Sound Control	01382-225619
DUNFERMLINE	Sound Control	01383-732273
EASTBOURNE	Bonniers Ltd.	01323-639335
EDINBURGH	Sound Control	0131-557 3986
EDINBURGH	The Warehouse	0131-555 6900
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GLASGOW	The Warehouse	0141-950 1757
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KINGSTON	Earth Music	0181-546 9877
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LIVERPOOL	Ad Lib	0151-486 2214
LONDON	Turnkey	0171-379 5148
LONDON	London Microphone Centre (LMC)	0181-743 4680
LONDON	The Synthesizer Company (TSC)	0171-258 3454
LONDON	Grady Theatre Services	0181-886 1300
LONDON	Raper and Wayman	0181-800 8288
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LONDON	Studio Spares	0171-482 1692
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NEWCASTLE-UPON-TYNE	Sound Control	0191-232 4175
NORTHAMPTON	Willow Communications	01604-21525
NORWICH	Caribro Academy of Sound	01603-666891
NOTTINGHAM	Caribro	0115-9581888
PETERBOROUGH	B&H Sound Services	01733 223 535
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SOS

WRH

shape of things to come

by Derek Johnson



Korg Kustomers

Korg's Trinity family of workstations is proving popular with dance musicians. Andy Whitmore, the producer behind the Peter Andre's hit album *Natural*, is a confirmed Trinity Plus user. The workstation was used on that album, plus projects with Michelle Gayle and MN8. Andy says: "I was very excited when I first heard the Korg Trinity was coming out. It's a very refreshing synth, and its 24-bit processing ensures the clarity of the final mix is totally astounding. When I start a new track, I find that if I just flick through the presets on the Trinity, I can find a great sound. It's easy to tailor sounds and it's very quick."

Black Grape's Martin Slattery, already a Korg Prophecy user, has recently taken delivery of a Trinity for use in the studio with rapper, Kermit (also of Black Grape). Martin and Kermit, as part of the band Man Made, are currently recording an album; about the Trinity, Martin comments: "It really has been a very valuable tool in my work with Kermit, as his style is mainly sample based, and the Trinity sounds are ideal for his music. I'd recommend it to anyone who needs to demo quickly."

A Korg UK Ltd, 9 Newmarket Court, Kingston, Milton Keynes, MK10 0AU.
T 01908 857100
F 01908 857199.

See, Hear!

Vision, the UK video, film and broadcast equipment show, has combined with the APRS Audio show, and moved to London's Earls Court 2. The newly named Vision & Audio 97 takes place from November 4-6 this year, and will cover all aspects of broadcast, post-production and recording technology. The exhibition, which sees the APRS celebrate its 50th anniversary, will also feature a three-day seminar and masterclass program, "addressing today's critical issues and presenting visitors with the whole broadcast story in sound and picture".

A Vision Exhibitions Ltd, 23-24 George Street, Richmond, Surrey TW9 1HY.
T 0181 948 5522.
F 0181 332 9376.

caught in the net

SOUNDTRACS

This month's round-up of new web sites and email addresses starts off with Soundtracs, who can be visited at:

W <http://www.soundtracs.co.uk>

UNITY AUDIO

Unity's web site is now up and running, and

products from all the company's distributed lines, including Dynaudio Acoustics, Vac Rac, Earthworks, Antares, Arboretum, GRM Tools, Gallery, Intelligent Devices and Spatializer, will be featured in detail. User comments, reviews, application guides, and many free software demo downloads will also be available.

W <http://www.unityaudio.co.uk>

EVI

EVI Pro Audio Group sales and service are now contactable by email. Company divisions Midas, DDA and Klark Teknik are all separately obtainable: beam a message to the address below, putting the name of the company or section you wish to contact in the subject line (Midas Sales, DDA Service, and so on).

E 106761.3240@compuserve.com

SONIC STATE

Sonic State (the "music and pro audio theme park") has added user reports to its SynthSite section. If you want to read what users think about their instruments, or

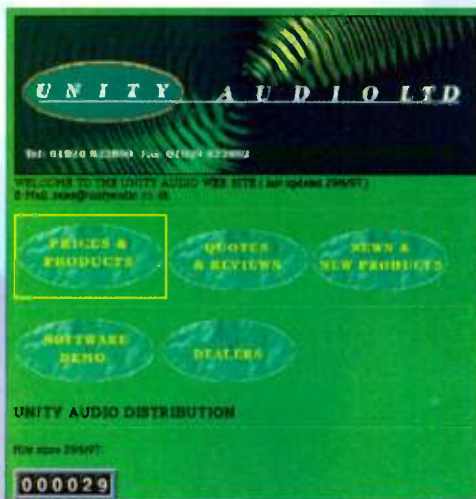
would like to contribute opinions, hints or tips of your own, give the site a visit. More than 500 synths, drum machines, samplers and workstations are listed.

W <http://www.sonicstate.com>

Huddersfield Contemporary Music Festival

This web site, which is about to be launched, will offer, in addition to background to the Huddersfield event, links to other contemporary music festivals. The site will also allow you to request a brochure or book tickets for the 60+ events at this year's festival, which is scheduled for November 19-30.

W <http://www.hud.ac.uk/events/hcmf/welcome.html>



P&R get Smart

P&R Audio, perhaps best known to the majority of us for their range of audio patchbays, have recently begun something of an expansion. The recent purchase of Smart Technology is the main catalyst for this change; Smart's core business is the manufacture of specialist computer systems, particularly in the fields of non-linear video and graphic workstations. P&R will soon be integrating an all-new Technology range into their existing product line. We'll pass on more details when we get them.

A P&R Audio Technology, Technology House, Swan Business Centre, Station Road, Hailsham, East Sussex BN27 2BY.

T 01323 849522.

F 01323 849533.

E praudio@btinternet.com



n... New epicureans p...ing a good break against the wall ...

EMI UK

Abbey Road Interactive have built a web site for EMI UK, in conjunction with London club and lifestyle mag *Sleaze Nation*. The site has been dubbed the new "alternative site aimed at music lovers". Artist profiles, interviews, news and "exclusive" information are all to be on offer.

W <http://www.emination.co.uk>

DANCE MUSIC RESOURCE PAGES

If you'd be interested in buying dance music via the Internet, take a peek at the Dance Music Resource Pages, which, in addition to offering a comprehensive weekly release listing of domestic and imported dance tracks, is now offering visitors the opportunity to order any of the week's new releases, as well as searching the site's archive of 16,000 releases.

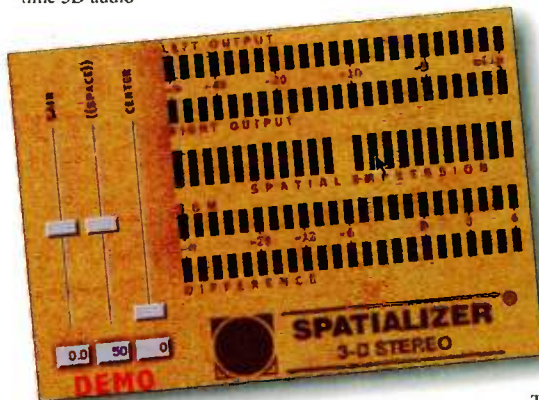
W <http://www.juno.co.uk>

Unity's Spatial Reasoning

Unity Audio, specialists in plug-ins for digital audio systems, have announced a range of new hardware and software products. First of all, Unity are to distribute the *Spatializer* plug-in for Pro Tools in the UK. The *Spatializer PT3D* 3D Audio Pro Tools TDM plug-in provides real-time 3D audio

also offering immediate access to 'hidden' functions, previously available only to experienced Pro Tools users via little-known key combinations.

The Production Palette control surfaces feature assignable zones, and Macintosh software which integrates with Pro Tools to offer remote access to all its menus, key-presses, and even MIDI-controlled functions. A single 'zone' on the Production Palette can fire off a complex sequence of Pro Tools operations, using a powerful Macro Engine which comes programmed with over 250 dedicated functions.

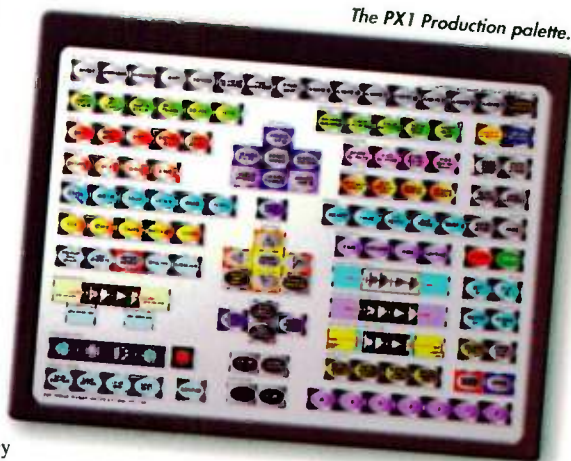


Spatializer's PT3D plug-in.

processing: the user has complete control over the amount of 'Spatialization', and the software provides level meters, sum/difference meters, and a 'Spatial Impression' Meter. According to the manufacturers, audio created using *Spatializer PT3D* seems to expand beyond the boundaries of two speakers, and the three-dimensional surround sound "envelopes the listener, adding an extraordinary sense of realism to otherwise ordinary sound". Any number of sounds may be positioned in space in real time, using familiar controls and a minimum of system resources. Famous users of *Spatializer* software include Aerosmith, The Eagles, En Vogue, Michael Jackson and Quincy Jones; film soundtracks featuring its particular brand of 3D treatment include *The Lion King*, *Crimson Tide* and *Broken Arrow*.

Gallery Software have announced no less than three editing control surfaces for Digidesign Pro Tools 4.0. Unlike other developers of hardware controllers for Pro Tools, who have focused on the mixing process, Gallery have targeted their devices clearly at Editors. The Production Palette is available as an A3- or A4-sized panel offering most of Pro Tools' functions on dedicated keys, grouped logically, colour-coded, and visually cued with icons. The A3 PX1 (£821 including VAT) adds a logically laid-out palette of tools which can speed up the editing process, while

The Zone Editor/Overlay Designer application allows you to define functional 'Zones' made up from multiple cells on the Production Palette. All you do is pick a Macro, and 'paint' it over the area where you want to assign that function. Each zone can be colour-coded and assigned text and an optional icon. The rest of the Production Palette range currently comprises the A4 PX5, at £640, and the A4 PX5i infra-red unit, at £734.



The PX1 Production palette.

Some of Unity Audio's plug-ins can be spotted on tours and open days that are happening over the summer, particularly Digidesign and Steinberg VST dates. Unity's plug-in range will also be featured on Syco's plug-in open day on August 22. Contact Unity, Digidesign (01753 653322), Steinberg (Harman, 0181 207 5050) or Syco (0171 625 6070) for details.

A Unity Audio, Upper Wheeler House, Herts SG11 1ET.

T 01920 822890.

F 01920 822892.

E sales@unityaudio.co.uk.

W <http://www.unityaudio.co.uk>

shape of things to come

E's a Synth

If you're looking for Emu's E4-series sampling quality without the hassle of sampling, check out the new E-Synth 64-voice sample playback module (price yet to be set). As standard, the E-Synth comes with 16Mb of samples in ROM, plus 4Mb of RAM; adding a CD-ROM drive lets you load in extra samples via the SCSI port, essentially turning the playback module into a sampler. Features include 16-part multitimbrality, eight balanced outs and digital I/O, and other expansion options can

take the unit to a maximum of 128Mb of internal RAM and 128 voices of polyphony.

And, if you're an existing EIV, E64, E6400, E4X, E4XT or E4K owner, the E-Synth ROM upgrade can easily add 16Mb of playback sounds to your sampler; the only proviso is that E4K owners will require a factory installation of the upgrade.

A Emu Systems, Unit 6, Adam Ferguson House, Eskmills Industrial Park, Musselburgh EH21 7PQ.

T 0131 653 6556.

F 0131 665 0473.

W <http://www.emu.com>

price cut corner



Roland

have announced a new low price of £1199 for their JP8000 analogue modelling synth (reviewed in February and March of this year), which takes effect immediately. That's an amazing saving of £300 on the original launch price. And if you actually bought a JP8000 at the old price, be prepared to take advantage of a decent offer: as an act of goodwill, Roland are offering existing JP8000 owners £100 cashback. In order to benefit from this offer, send a photocopy of your shop receipt, JP8000 serial number, and your name and address to Paul McWilliams, Customer Sales Support at Roland. Such nice people!

A Roland UK Ltd, Atlantic Close, Swansea Enterprise Park, Swansea SA7 9FJ.

T Brochure line 01792 515020.

F 01792 799644.

News now of another price cut, this time from Joemeek distributor Sound Valley. The VC3 Pro Channel (reviewed in October of last year), which originally retailed for £299, has now been slashed to £199. While this is probably a little frustrating if

you've just bought a VC3 at the old price, for everyone else the price cut provides an ideal opportunity to sample the Joemeek sound for less cash.

A Sound Valley Distribution Ltd, The Briars, North Road, Amersham,

Bucks HP6 5NA.

T 01494 434738.

F 01494 727896.

HW International have announced price reductions of between 15% and 20% for Shure dynamic mics (including the SM58), a situation brought about by, amongst other things, favourable exchange rates.



Example price drops are: SM58, £128 down to £103; Beta 56, £175 down to £150; and Beta 58A, £195 down to £165. Check out the Shure range, and HW's other lines, in their new glossy catalogue.

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

T 0181 808 2222.

F 0181 808 5599.

E hwinternational@dial.pipex.com



Virtue rewarded with Vice

Noted producer Alan Parsons, featured in *SOS* in May 1986 and November 1993, has been appointed Vice President of EMI Studios Group, UK. The most famous studio in the group is, of course, Abbey Road, but Parsons will also be responsible for Olympic, The Town House and the Manor Mobiles. This is a bit of a homecoming for Alan: he recorded most of Pink Floyd's *Dark Side of the Moon* at Abbey Road back in 1973.

Alan will also be making a personal appearance at Rose-Morris's Pro Audio Department — that's in Denmark Street, London — on July 23, at 2pm. Arranged in conjunction with Audio Technica, the appearance will see Alan answering questions about recording techniques and Audio Technica mics. Contact Rose-Morris on 0171 836 0991 (or email info@rose-morris.co.uk).

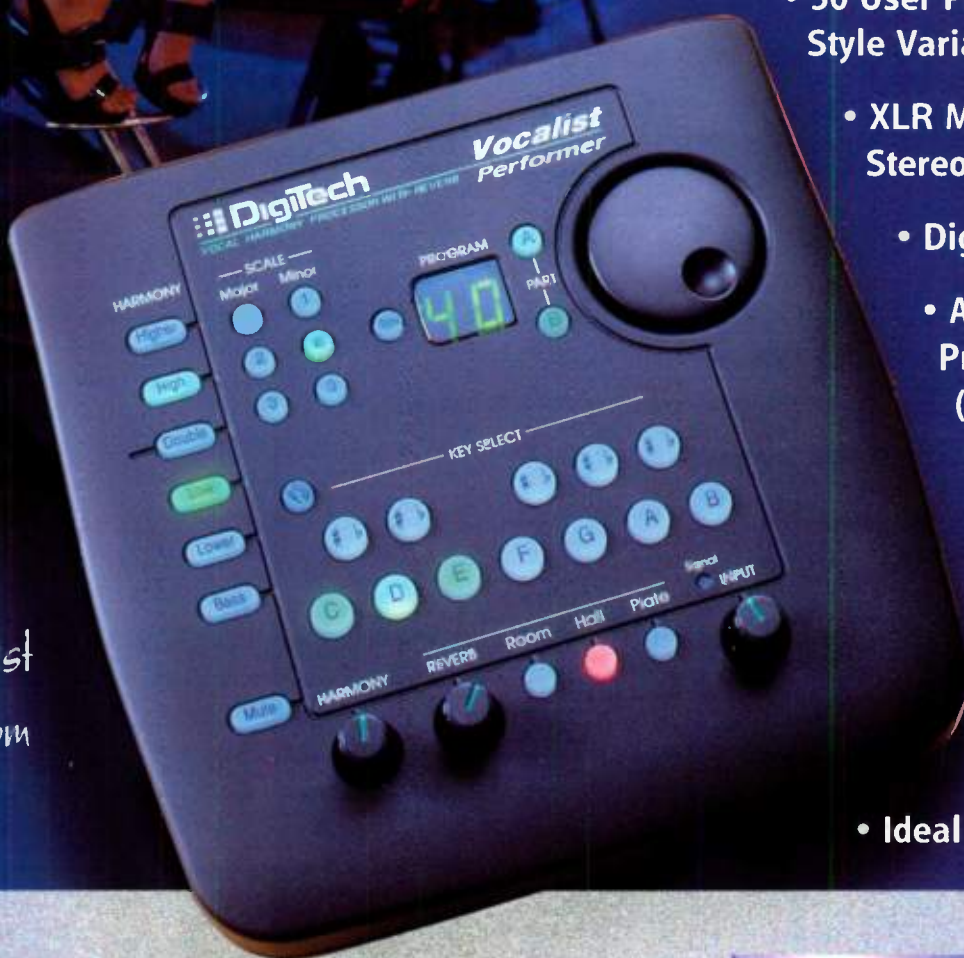
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Our full Internet address is 100517.1113@compuserve.com.

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shape of things to come



Deltron Components have released a pair of new connectors. The new Delline XLR connectors incorporate an anti-vibration collar and use a nifty colour-coded identification system. In conjunction with A&R Cambridge, they have also developed a new Camcon loudspeaker connector, which conforms to the new EN60065 European safety standard; familiar 4mm and smaller banana plugs have the potential to be inserted into European mains sockets, so have been banned. The new connector has a 6mm outer diameter, plus many safety features.

T Deltron Components
0181 965 4222.

World Control have announced a price cut on their K2000/K2500 sound sets. The sets, which offer jungle sounds, TB303 emulations, Waldorf and Nord Lead emulators, now cost £29.95 each in the UK (£35 outside the UK, or US\$60). Demos are available at <http://www.u-net.com/~wcontrol>.

T 0113 246 9254.

Interactive Light's Dimension Beam, reviewed in SOS's June Issue, has been taken up by Roni Size, of drums 'n bass outfit Represent Is. Roni enthuses: "I've been waiting for something like this to happen — our music is an expression, a vibe, and the Dimension Beam offers the real-time control we need to help keep the vibe going."

T X Music 0117 973 5128.

Lindos Electronics, manufacturer of the LA100 audio analyser, have released *LinPsi*, remote operation software for the Psion 3 series of personal organisers, allowing results to be stored for later detailed analysis without needing access to a bulky laptop. *LinPsi* is fully compatible with *Lin4Win*, the LA100's PC-based control software.

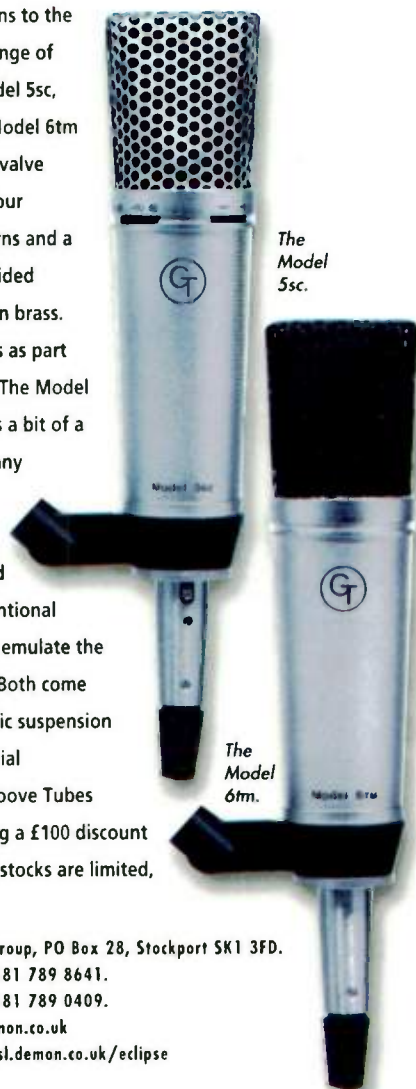
T 01394 380307.

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100517.1113@compuserve.com.**

Feelin' Groovier

The latest additions to the Groove Tubes range of mics are the Model 5sc, and Model 6tm. The Model 6tm (£999) is a high-grade valve condenser mic, with four selectable polar patterns and a large-diameter, dual-sided capsule, hand-tooled in brass. A power supply comes as part of the 6tm's package. The Model 5sc (£499), however, is a bit of a departure for a company with valve designs as its reason for existence: this cardioid condenser uses conventional solid-state circuitry to emulate the Groove Tubes sound. Both come supplied with an elastic suspension and mic clip. As a special introductory offer, Groove Tubes dealers will be offering a £100 discount on retail prices — but stocks are limited, so move fast!



The Model 5sc.

The Model 6tm.

A Eclipse Marketing Group, PO Box 28, Stockport SK1 3FD.
T 0161 612 8186/0181 789 8641.
F 0161 612 8186/0181 789 0409.
E eclipse@axisasl.demon.co.uk
W <http://www.axisasl.demon.co.uk/eclipse>

CD-ROM strikes a Chord

CD-ROM *Guitar Chord Finder* is a new book/CD-ROM combination which offers a straightforward way to hear and learn chords. The book contains 350 common chords, with hints on how to read and play them. The CD-ROM provides a tuning reference, and displays chords on



screen as well as playing them as a block or arpeggiated. A virtual neck shows chords as mirror image or tablature, and chords are also shown in 'home' and 'movable' positions. This package costs just £9.95, and at present is only available for PC users. You need a 386 with Windows 3.1 or better, a CD-ROM drive, and a SoundBlaster or compatible soundcard. It's available at all good music stores.



It's FAT, it's round, it makes a squelchy sound...

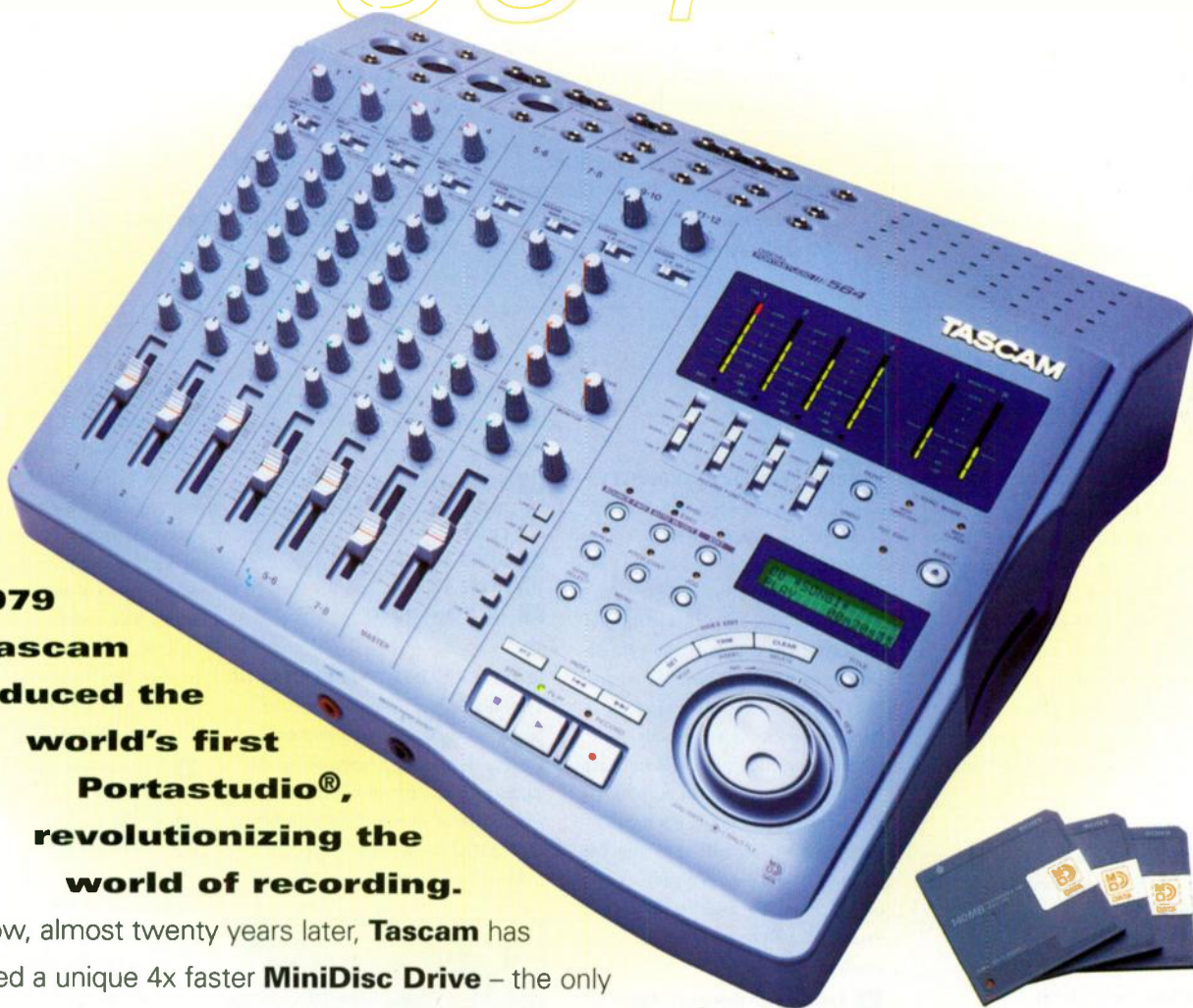
The latest addition to the Freeform Analog Technologies range is the THC00 Resinator, a 1U, rackmounting, triple-band, LFO-modulated filter bank and stereo signal modulator. It features three separate band-pass filters, each of which has an individual frequency mid-point control. resonance depth for each of the bands can be increased or decreased via a separate control. The three filters are then swept by either the internal LFO, which features controls for rate, depth and modulation type, or via an external signal. The signal can then be further processed through a

dedicated envelope follower with controls for depth, decay and polarity, and then treated via a stereo panner. Inputs are duplicated on both front and back panels, avoiding the accessibility problem found with so many rack units of this type. The Resinator is priced at £199 including VAT.

A Turnkey, 114-116 Charing Cross Road, London WC2H 0DT.
T 0171 379 5148.
F 0171 379 0093.
E sales@turnkey.demon.co.uk
W <http://www.turnkey.uk.com>

inspired
TASCAM

The digital portastudio[®] 564



**In 1979
Tascam
introduced the
world's first
Portastudio[®],
revolutionizing the
world of recording.**

Now, almost twenty years later, **Tascam** has invented a unique 4x faster **MiniDisc Drive** – the only drive powerful enough for the world's first **Digital Portastudio[®]**.

The **Tascam 564** has all the simplicity and ease of use of a traditional cassette Portastudio but with digital sound quality and unique new features like **sequencer-style editing** and **"non-destructive" track bouncing**. The Tascam 564 uses **MD Data Disc** – a new removable digital recording format – to give **37 minutes** of digital 4-track recording on a single disc.

The **564 Mixer Section** is equipped with all the superior features you'd expect to find on a top Tascam Portastudio: **balanced XLR and jack mic/line connectors; 3-band sweepable mid EQ; 4 additional stereo inputs and 2 effects sends** on each channel; flexible monitoring; individual track outs, 2 stereo outs and a stereo **S/PDIF digital out**.

A **Looping and "Best Take" Function** continuously loops any section of a song and records and stores up to **five different takes** of a solo or drop-in before you Select and Save the

best one! **Powerful Digital Editing** functions allow you to cut and paste recordings like a **sequencer**; moving, erasing and copying different song parts and programming them to repeat and play-back in any order you choose. And up to **five levels of full 4-track bounce** can be achieved before any tracks are erased.

The Tascam 564 also features advanced synchronization capabilities, with both **MIDI Time Code and MIDI Clock** output, as well as all the usual varispeed, auto punch-in/out and rehearse mode features.



564

Z1: Now it's personal...

If, after reading this month's exclusive preview of Korg's forthcoming Z1 physical modelling synth, you get the entirely

understandable urge to find out more, truck on down to your nearest Digital Village or Music Village to check out the Korg Digital Domain Roadshow. Along with the first UK in-store showing of this new flagship synth, you'll see demos of the SoundLink 168RC digital mixer, Trinity workstation and upgrader, and the new 12/12 I/O PCI card, reviewed in last month's SOS.

The dates, venues and contact numbers are as follows:

- July 26, Digital Village, Croydon, 0181 407 8444.
- August 2, Digital Village, Barnet, 0181 440 3440.
- August 9, Music Village, Chadwell Heath, 0181 598 9506.
- August 16, Music Village, Cambridge, 01223 324536.

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education corner

ISLINGTON MUSIC WORKSHOP

Islington Music Workshop have recently added more gear to their SSL G+ based training facility, namely three Apple Power Macs running Emagic's Logic Audio and Digidesign Pro Tools: four Akai S3000XL samplers; a Roland JV 1080 synth module; an Alesis ADAT XT digital 8-track tape recorder; an SPL Classic Vitalizer enhancer; and an AMS 1580S delay. The school is enrolling now for September courses.

- A** Islington Music Workshop, 44 Peartree Street, London EC1V 3SB.
- T** 0171 608 0231.
- F** 0171 490 0120.

SCHOOL OF SOUND RECORDING

Manchester's School of Sound Recording is holding an open day on Saturday, August 2. The day will run from 12pm to 4pm, and there's no need to book: just show up between those times. You'll get a chance to meet staff and students, with practical demos and seminars throughout the day. The last year has seen the school expand both its curriculum and equipment: an Amek Big By Langley desk plus three Alesis ADATs have been added recently.

- A** School of Sound Recording, 10 Tariff Street, Manchester M1 2FF.
- T** 0161 228 1830.

BOURNEMOUTH UNIVERSITY

Bournemouth University's School of Media Arts & Communication is launching a "unique" new course this autumn: an MA in Sound Design for the Moving Image, the first of its kind in Europe. The course, which joins the University's MA in Music Design for Film & Television, will be split into three levels: Certificate (practical), Diploma (practical plus academic) and MA (practical and academic, plus project and dissertation). For the most part, the university will be looking for candidates with post-graduate qualifications, but relevant life experience will be taken into consideration.

- A** Bournemouth University, Talbot Campus, Fern Barrow, Poole, Dorset BH12 5BB.
- T** 01202 595114.
- F** 01202 595287.

THE MUSIC IT PACK

If you're a teacher who's baffled by music technology and the equipment needed to meet the statutory requirement of the National Curriculum (that "all pupils should be given opportunities, where appropriate, to develop and apply their information technology capability in their study of music"). *The Music IT Pack* (£7.50) is made for you. The pack, which has been produced by the Music IT Support project, funded by the Department for Education and Employment, and managed by the National Council for Educational Technology, contains a set of "choosing and using" guides. These form the core documentation produced for teachers at Key Stage 3 (the curriculum point where pupils should use IT to "explore, create and record sounds"). The guides aim to provide

practical advice on selection and application of currently available music technology resources.

- A** NCET Bookshop (MUS), Milburn High Road, Science Park, Coventry CV4 7JJ.
- T** 01203 416669.
- F** 01203 411418.
- E** sales@ncet.org.uk

ESTOVER COMMUNITY COLLEGE

The Soundhouse community music project, based at Estover Community College, is offering a range of one-day studio production courses aimed specifically at women. Under the banner of WOMAT — Women's Opportunities in Music and Technology — the courses



Above: Real Steel, and (right) their album Bounce.



aim to provide everyone with the opportunity to check out career possibilities in music and technology.

Other Soundhouse news is that *Bounce*, the album by Real Steel, an all-female steel band that was recorded by Soundhouse students, has been released. It can be obtained for £7.99 from Tim Gilbert at the Soundhouse.

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

PERTH COLLEGE

Scotland's Perth College are enhancing their HND rock music course — one of the UK's first full time courses in the subject, started back in 1985 — with specialist trumpet, trombone and sax tutors. The instruments will be taught alongside vocal and rhythm section, with a wide variety of styles being covered. The school's facilities include rehearsal and practice suites, a performance area with full PA, and a new 24-track digital studio.

- A** Perth College, Crieff Road, Perth PH1 2NX.
- T** 01738 621171.
- F** 01738 631364.

CITY COLLEGE, MANCHESTER

Raw Fish Records is the new label launched by City College, Manchester. The debut releases will be a 22-track promo CD compilation and a 12-inch dance sampler of unsigned artists. The first release, sponsored by pressing company MPO (UK), was released at the one-day music industry seminar Showcase 97 on June 30, which featured an evening of performances by artists appearing on the CD. The label aims to release at least two unsigned artist compilations a year, and is looking for a "major licensee" for its records.

- A** Raw Fish, Phil Ellis, Room M5, City College Manchester, Sale Road, Manchester M23 0DD.
- T** 0161 957 1736.
- F** 01625 617981.
- W** <http://www.manchester-city-coll.ac.uk/showcase/>

LEWISHAM COLLEGE

The M Corporation have recently supplied equipment to Lewisham College for their new BTEC in Media Studies. The new facility centres around a Yamaha 02R desk and two Alesis ADAT XTs, with links both to a soundproof live room and to the



The School of Sound Recording.

Heavenly see the (Fair) Light

Heavenly Music are about to release a new CD-ROM: *Fairlight Series II* contains hundreds of AWE32/64/64 Gold SoundFont banks, including all of the sounds from this classic machine's library. The next CD-ROM in Heavenly's range will be *Analogue Mania*, a huge collection of classic and contemporary analogue synth basses,



Above: the 02R room and (left) the radio room at Lewisham.



college's theatre via 60-metre tie lines. Paul Speare, course co-ordinator comments: "The great advantage of this digital system for live recording is that you can record everything with no EQ and loads of headroom, because you know there'll be no noise problems when mixing later on — we've been totally amazed by how clean tracks are. If it wasn't for the audience, you'd think the recordings were made in a very expensive studio. Another feature that has saved us hours of workshop time is the ability to store and recall different students' mixes, including all the internal dynamics and effects processors, at the push of a button. The next phase is to use the 02R to send mixes up to the TV vision mixer for live audio-visual productions."

For radio presentation, Lewisham were recommended to invest in the Soundcraft Series 5 broadcast desk, a compact desk suited to the constraints on college room space. Paul Speare explains: "It's very easy to grasp the basic functions, which is essential to get the students interested from the word go, but it's packed with features they'll need to learn about later." The M Corporation's Tim Robertson arranged for the College to try out some of the gear prior to purchase, and

Peter Dale, M Corporation's Senior Engineer, installed the equipment and provided hands-on training.

A The M Corporation, The Market Place, Ringwood, Hants BH24 1AP.

T 01425 470007.

F 01425 480569.

A Paul Speare, Lewisham College, Lewisham Way, London SE4 1UT.

T 0181 692 0353.

THAMES VALLEY UNIVERSITY

Thames Valley University will be running a series of short courses this summer at Ealing Film Studios. Each subject lasts 20 hours, over two nights a week; topics include Music Studio Techniques (two parts), Introduction to Synthesis, The Modern Music Industry, Creative Radio (two parts) and Radio for DJs. Other courses covering MIDI and sequencing, sampling and multimedia may also be available.

A UCCL Programmes Office, Thames Valley University, Wellington Street, Slough, Berkshire SL1 1YG.

T 01753 697719.

F 01753 697691.

GUILDHALL SCHOOL OF MUSIC & DRAMA

In September, the Guildhall School of Music & Drama will be starting their first BMus with music technology available as a 'principal study'. The syllabus will include creative tuition, theory, history and analysis, plus practical workshops. Students will also be able to concentrate on performance, studio production or composition.

A Guildhall School of Music & Drama, Barbican, London EC2Y 8DT.

T 0171 628 2571.

F 0171 256 9438.

E info@www.gsmd1.demon.co.uk

W http://www.gsmd1.demon.co.uk

pads, keyboards, swells, filters, pops, clicks and other sounds of the type now featuring on almost every dance record. Most of the files will load into a standard 512K AWE, although 2Mb is recommended for the larger files. As a bonus, both sets contain an awesome collection of WAV sound files, including drum and percussion loops. Prices are just £42.99 for each CD-ROM, plus £3.60 UK postage, or £5.60 world postage.

The latest in Heavenly's respected 28-strong 'building block' series of MIDI file disks is *Extreme Reggae*. The disk contains enough beats, basslines, keyboard and guitar riffs to allow users to build up a track from scratch, or add some spice to an existing sequence. *Extreme Reggae* is available for an introductory price of £14.99 plus p&p.

A Heavenly Music, PO Box 3175, Clacton, Essex CO15 2RP.

T 01255 821039.

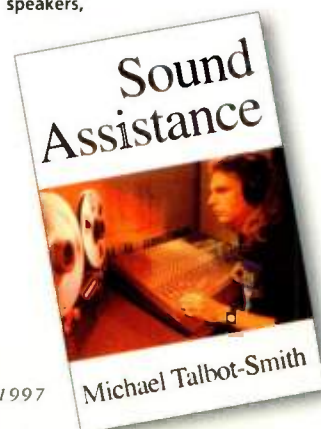
F 01255 821039.

E heavenly@ortiz.demon.co.uk

W http://www.ortiz.demon.co.uk

Audio Assistance

Sound Assistance, by Michael Talbot-Smith, has been designed as a "readable and easy to understand" book aimed at anyone wishing to work as a sound assistant, but who lacks a thorough grounding in maths and physics. The book is claimed to be particularly relevant for anyone considering taking an NVQ Sound Assistance Level 2 or Sound Operation Level 3 course. It starts from basic electrical principles, going on to cover electronic devices, sound and hearing, basic acoustics, mics, speakers,



Hire specialists Hilton Sound have recently augmented their hire stock; a comprehensive list of new items includes API 550B 4-band EQs, a Neumann M149 mic, TC Electronics Finalizer, Telefunken V76S mic, Otari Radar, Manley stereo compressor/limiter, Summit TPA200B, Roland SRV330 space reverb and SDE330 space delay, plus much more. Ask for a full list of gear and hire prices.

T 0181 459 1001.

Shure have been named the official mic supplier for the 1997 Montreux Jazz Festival. Apparently, a gang of famous Shure endorsees will be available on the stand of Audio System AG, the company's Swiss distributor, should you happen to be in the vicinity!

T HW International 0181 808 2222.

Three new expansion options are now available for Quasimidi's 309 Rave-O-Lution. The output expander (£149) offers two extra audio outs, plus a pair of audio ins, allowing external sounds to be treated by the 309's filter and modulation options. The two ROM expansion boards (£99 each) — one each for Synth and Drums — are also now available; both add all new waveforms and patches, and both can be added to the 309, since it has two expansion slots.

T Turnkey 0171 379 5148.

Music 100 — The History of Recorded Sound, is an interactive exhibition of the British music industry in this century. All forms of music, from popular to classical, will be featured, from the days before recorded sound up to 1997. The venue is Gallery West, Cabot Place West, Canary Wharf, London E14, and the exhibition runs until January 12 of next year. Admission is £6 (£4.50 concessions).

Following the acquisition by Akai of International Music Corporation, the US manufacturer of Jackson and Charvel guitars, Akai UK will now distribute those instruments in the UK. This is a new area for Akai, known by hi-tech musicians for their ubiquitous samplers, and a new team has been employed to handle sales and customer support.

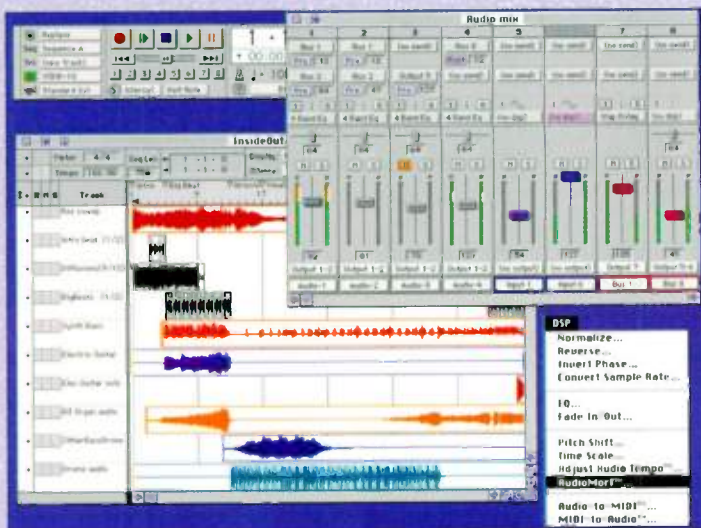
T 0181 897 6388.

analogue and digital recording, TV sound and PA. There's even a section on safety, plus a glossary and a further reading list. The author is a former trainer of audio engineers at the BBC's Wood Norton facility. *Sound Assistance* is available from SOS mail order, priced £14.99, order code B354 (plus postage, UK £2.50, Europe £5.50, ROW £8.50).

A SOS Publications Ltd, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.

T 01954 789888.

F 01954 789895.



Opcode move House

Following SCV London's move into software, with the formation of their new Software Division, the company have announced their appointment as exclusive UK distributors for Opcode software and hardware products. As many readers will know, Opcode's range consists of the *Vision* family, which includes the newly released *Studio Vision Pro v3.5.2* MIDI + Audio sequencer, the deluxe CD edition of which includes a handful of free

plug-ins and demos from the likes of Waves and Arboretum, plus the *Cyburban OMS* arpeggiator. Opcode also have a useful range of Mac MIDI interface/patchbay products (most of which were covered in last month's round-up of Mac MIDI interfaces and this month's partner feature on PC MIDI interfaces, elsewhere in this issue).

A SCV London, 6-24 Southgate Road, London N1 3JJ.
T 0171 923 1892.
F 0171 241 3644.

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

Our full Internet address is 100517.1113 @compuserve.com.

Orange Book

should push all the right buttons, and costs just £9.95. The book runs to 160 pages, is illustrated, and includes a discography of all band and solo recordings. The bulk of the book is given over to a discussion of the band's core releases, which number between 50 and 60, and the shifting personnel and musical focus of an amazingly long-lived, and undeniably influential, recording and performing unit.

A SAF Publishing, 12 Conway Gardens, Wembley, Middlesex HA9 8TR.
T 0181 904 6263.
F 0181 930 8565.

Miles more Midiman

The Midiman range of PC MIDI interfaces and compact, handy mixers just keeps on growing. As you might guess from the name, the

departure, another new product from Midiman is the DigiPatch 12X6 digital audio patchbay (£379), which offers six co-axial and six optical inputs, routable to



Midiman DigiPatch 12X6.

Portman 4X4/S (£249) is a 4-in/4-out MIDI interface for PCs: the S indicates that it reads, writes and regenerates SMPTE timecode. When not connected to a PC, the interface functions as a MIDI patchbay. In a bit of a

six pairs of co-axial and optical outputs. The unit is under MIDI control, and multiple DigiPatches can be cascaded together for even more flexibility; program the unit from its front panel or by Mac or PC software, available from Midiman.



Multimixer 10.



Mixim 10.

On the audio mixer front, there's the Mixim 10 (£169), a quiet 10-input mixer with three-band EQ, an effects send and two mic channels with XLR connectors and independently switchable phantom power. Finally, the ultra-simple Multimixer 10 (£89) offers six pannable mono inputs plus two stereo channels — ideal for the desktop musician.

A Midiman UK, Hubberts Bridge House, Hubberts Bridge, Boston, Lincs PE20 3QU.
T 01205 290680.
F 01205 290671.
E 106133.2372@compuserve.com

If Tangerine Dream are in any way important to you, then share your feelings with Paul Stump. His *Digital Gothic — A Critical Discography of Tangerine Dream*, published by the excellent SAF Publishing,



Monitoring Quality

From The Orb & the Finnish National Opera....



BM5

£395 Per Pair

inc VAT

Introducing the BM Series

It took 15 years, 100 Danes, a few million Kroner and an englishman with attitude to come up with the BM Series. Fortunately it was all wort while! We wanted to make a monitor which not only reproduced sound balances accurately but also enabled anyone to hear the difference between good and bad sources. Many low to mid priced systems simply do not reveal the subtle distortions and resonance's which creep into a multitrack recording because they are hidden by the coloration of the speaker itself.



BM10

£595 Per Pair

inc VAT



BM15

£799 Per Pair

inc VAT

So how do we do it?

Dynaudio Acoustics has produced monitor systems for some of the worlds finest studios and they have used the same uncompromising engineering standards in the BM Series High volume cabinet production and the automation of component manufacture has produced massive cost reductions without compromising quality at all. In fact the BM Series could sell for twice the price, but don't worry, that's a job for our competitors.



BM6A

£1386 Per Pair

inc VAT

New active model now available

....To The Chemical Brothers & Metallica

Main Dealers:

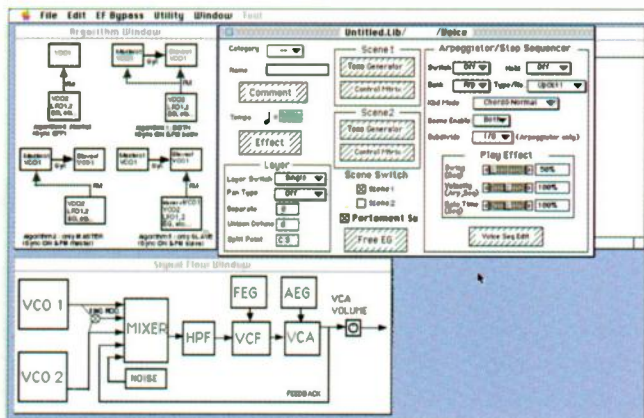
Academy of Sound • Andertons • Blue Systems • CTS • Digital Village • Dawsons • Funky Junk • HHB • Intersound • KGM Larking Audio • M Corporation • Project Music • Raper & Wayman • Rose Morris • Sutekina • Stirling Audio • Systems Workshop • X-Music

Dynaudio Acoustics is distributed in the UK by:
Unity Audio. Tel: 01920 822890 Fax: 01920 822892

UNITY AUDIO LTD

Dynaudio Acoustics, Unit 21 Riverside Workshops, 28 Park Street, London SE1 9EQ UK
Tel: +44 (0)171 403 3808 Fax: +44 (0)171 403 0957 Compuserve: 100072,2302

shape of things
to come



Yamaha's Free for All

Yamaha's commendable and customer-friendly habit of releasing free software editors and sounds for their products is being continued for the AN1x physical modelling synth, reviewed in full in this issue. Currently available for the Mac (with the PC version due imminently), the editor offers full control over all parameters, including some which are normally hidden. Naturally, the editor will also enable you to archive your sounds to disk. It can

be downloaded from Yamaha's web site (<http://www.yamaha.co.uk>), which will also contain additional, free, AN1x voice data; alternatively, contact any Yamaha dealer, who should be able to supply the software or the sounds.

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

Ready to Ware

System Solutions have been appointed the new UK and Eire distributors for the Creamware range of products. One of the first results of this new arrangement is a relaunch of, and a price cut for, Creamware's MasterPort high-end, ISA-format, 16-bit soundcard/software package. Although the MasterPort card is essentially that provided with Creamware's top-of-the-line TripleDAT system (to which MasterPort can be upgraded), the new package is designed to turn your PC into a digital audio workstation without needing to add any extra hardware or software. Let's run down MasterPort's spec:

- Up to 16 stereo tracks.
- Real-time non-destructive edit.
- Volume automation.
- Real-time 4-band parametric EQ.

• Effects and processors, including room simulator, delay, pitch-shifter, compressor, limiter and noise gate. The card itself provides a range of analogue and digital ins and outs — three S/PDIF (an optical and two co-ax) stereo ins and optical and co-ax stereo outs — plus MIDI In and Out, with an option for AES/EBU digital interfacing.

Creamware's range also includes, or will shortly include, the TDAT16, a multiple input/output box, the A8 and A16 8-channel and 16-channel AD/DA units, the *Osiris* denoiser, declicker and enhancer plug-in and the *FireWalker* real-time DSP plug-in suite (which offers chorus, flanging, transposition, and more).

- A** System Solutions, 17-18 Blackwater Street, London SE22 8RS.
- T** 0181 693 3355.
- F** 0181 693 6936.
- E** sales@system-solutions.co.uk

TURNKEY

dynaudio

EMTEON

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



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

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

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.

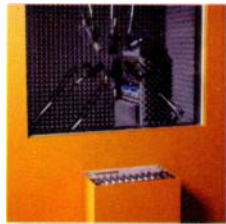
Take 8 bus consoles - hundreds are bought each year on recommendation. Bearing in mind the sums involved it's hard to believe that the opportunity to properly compare the various brands for EQ and noise has not previously been offered.

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.



Compare 6 mics. by recording simultaneously to ADAT.



Pro-Tools III and Soundcraft DC2020 in Studio 1.



Huge range across Mac, PC and Acorn platforms.

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

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Fax: 0171 379 0093 114 Charing Cross Road London WC2H 0DT

KORG

SOUNDLINK 168RC



ALL DIGITAL EIGHT BUSS MIXER

Over the last few years, Korg's SoundLink digital recording and editing system has gained wide respect in the post production and broadcast areas, with its combination of flexibility and excellent sound quality. Using the experience they have gained with this product, they have now produced the SoundLink 168RC digital mixing console, which offers unprecedented facilities in an amazingly compact format.

There are 16 digital inputs and outputs in the ADAT optical format, allowing connection not only to ADAT's themselves, but also to the vast range of other equipment now supporting the format, as well as eight analogue mic / line inputs, two of which have phantom power. The master outputs are also available as coaxial SPDIF. For those of you who would prefer more analogue connections, Korg are also producing high quality external 8 channel A/D and D/A converters, again using the ADAT format. And if all this isn't enough, you can cascade multiple 168RC's together for as many channels as you like, also leaving plenty of room for future expansion.

- Internally, the 168RC has 8 subgroups, 3 band EQ, each of which is sweepable, and with 'Q' on the mid band, two external and two internal auxiliary sends. The internal aux sends are routed to two high quality effects processors with some of the finest algorithms around, including reverb, delay, distortion, pitch shift, dynamics processing and even speaker simulation. For automation, up to 100 'scenes' can be stored internally, taking a snapshot of every single parameter of the desk, which can then be recalled at the touch of the button, and in addition to this all parameters can be dynamically controlled in real time via MIDI. All in all, a tour de force product with far too many features to detail here. Call now for a demo!
- 24 Input 8 Buss Digital Mixer
- Snapshot & Full Dynamic Automation
- 2 Built In Effects Processors
- 16 Channels of Digital Ins & Outs
- Optional Outboard A/D & D/A Convertors

NEW PRODUCT
£1899
CALL FOR DETAILS
turnkey
Tel 0171 240 4036



ProTools v4.0 Package

- 7300/166 32/1.2/CD & Keyboard
- Apple 1705 17" MS Display
- ProTools Core & 882 Interface
- 2 Gbyte Approved HD

NEW MAC
£7995
INCLUDING INSTALLATION
£9394.13 INC VAT

ProTools Project Package

- 7300/166 32/1.2/CD & Keyboard
- Apple 1705 17" MS Display
- 2 Gbyte Approved HD
- ProTools Project Core
- 882 VO Interface

NEW MAC
£4625
INCLUDING INSTALLATION
£5434.38 INC VAT

AudioMedia III Package

- Performa 6400/180 32/1.6/CD 28.8 modem & Keyboard
- Apple 15" AV MS Display
- AudioMedia III card
- ProTools PowerMix Software

NEW MAC
£1995
INCLUDING INSTALLATION
£2344.13 INC VAT

digideSIGN

ProTools Plug-ins

t.c. tools

Arguably the best envorb plug-in available. TC Tools uses algorithms developed from the M580 mainframe reverb. Great user interface allows you to visualise the effects via the graphics, making it intuitive and easy to use.

£775

Dolby Surround Tools

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

£1339

Focusrite D2

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

£880

Antares Auto-Tune

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

£580

BIG by Langley



As Amek dealers we 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 Auxillaries
- SuperTrue V3.1 VCA Automation
- Virtual Dynamics on-screen editing
- Unique Rupert Neve Voice Recall
- 12 bus, 24 output
- Frame sizes from 28 to 44 Inputs

INCREDIBLE VALUE
£POA
CALL FOR A DEMONSTRATION
turnkey
Tel 0171 240 4036

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

*We will beat any genuine price from a UK or European dealer. We must be able to substantiate the quote and the goods must be available and in stock. Prices include 17.5% VAT except DigideSIGN bundles. E & O E. UK mainland only. From £199

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EUROPE'S LOWEST

KORG

12 CHANNELS FOR UNDER A GRAND?

The card that everyone's been waiting for! Now you can use Cubase VST (amongst others), and have multiple inputs and outputs, without spending a fortune!

But the PCI 12121/O is far more than just a soundcard - it can become the very heart of your studio. There are stereo analogue ins and outs featuring 20 bit delta-sigma ADC's and 18 bit linear DAC's, SPDIF in and out, and 8 more digital ins and outs in standard ADAT format. The best part is that all these connections can be used independently giving you a total of 12 inputs and outputs! What's more, word clock and ADAT 9 pin connectors are provided, allowing sample accurate synchronisation with ADAT's and many other digital devices.

If you're not a MIDI user, the highly capable Deck II is an ideal choice. Fully featured with multitrack recording and extensive cut and paste editing facilities, Deck can sync to almost anything, including Quick Time movies and standard MIDI files, does file format conversion and supports plug ins.



Call for more details or to arrange a demo - this card could change your whole way of working!

- 12 Ins, 12 Outs and Digital Sync on 1 Card
- ADAT Format Ins & Outs
- Compatible With Cubase VST
- Optional Deck II Software bundled for £249

NEW PRODUCT
£599

THE UK 4 TRACK CENTRE

Our famous 4 track pack includes everything you need to start making music. Mixall headphones, a dynamic microphone, a chrome tape, cables, head cleaning kit and the best book we've yet seen on multitrack recording, taking you through basic track laying, mix-down etc... with sections on everything from mic placement to synchronisation and MIDI. We've obtained some great 4 track pricing and for a limited period, we will give you the 4 track pack (normal price £38.95) absolutely free when you purchase any of these multitrack recorders.

PORTASTUDIOS

PORTA 03 MkII

New version of a classic portastudio. Improved lighting and metering.



NEW
£349

TASCAM

414

All new Portastudio from Tascam! Records to all 4 tracks at once using DDX noise reduction. Double speed recording for better punchiness. 3 band EQ, 4 mic inputs with full LED monitoring make it great value for money. Includes first class track pack!

RRP £229
£149

ALL INC '4 TRACK PACK'
RRP £499
£469

XR SERIES ALL INC '4 TRACK PACK' FOSTEX MULTITRACK RECORDERS

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

XR5 Stunning new double speed Fostex machine with individual EQ up to 3 aux sends and 2 stereo returns. 2 inserts & 4 separate tape outs allowing use with an external mixer.

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

D5 DAT RECORDER

Exclusive cheap 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. 19' rackmount, 44.1kHz analog recording, SCMS free operation, error detection indicators, balanced ins and outs on XLR, AES/EBU professional digital connections as well as all the usual DAT features from the makers of the industry standard D208 (variable master), Hype reduction.

RRP £420
£335
RRP £499
£449
RRP £1299
£769

DA20 DAT MACHINE

If you need a 19" rack mount DAT machine, they don't come any cheaper than this! But that's not at the expense of a quality machine; reliable tray-loading mechanism, SCMS is switchable in or out, both analog and digital recording at all 3 sample rates and coaxial SPDIF in and out. High sound quality is guaranteed by 1-bit DAC playback, and there is a special 'Table-of-Contents' feature.

TASCAM



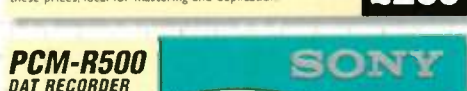
RRP £799
£639

DA30 MkII DAT RECORDER

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

102MkII & 202MkII TAPE DECKS

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



RRP £249
£199

RRP £349
£269

PCM-R500 DAT RECORDER

Sony lead the way in the DAT market, once again with the new PCM-R500. A professional machine through and through, it features a true stereo direct drive transport, jog shuttle wheel for fast precise transport control, balanced ins and outs, AES/EBU digital connections, and Sony's proprietary Super Bit Mapping system to get the maximum possible quality out of the unit's ADC's. Unbeatable price only from Turnkey!

SONY



RRP £1175
£999

DTC-ZE700 DAT RECORDER

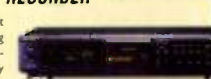
We have exclusively secured a small supply of the Sony DTCZE700 to bring you the cheapest full size DAT machine on the market, but this is not at the expense of features. SPDIF coaxial input and optical in and out, digital and analog recording at all three sampling rates (32 kHz, 44.1 kHz, 48 kHz), as well as all the usual ID functions and a full function infra red remote control. Also features Sony's exclusive Super Bit Mapping technology for incredible recording quality. Another DAT exclusive from Turnkey!



RRP £729
£449

MDS-JE500 MINIDISC RECORDER

Although DCC looks to have died as a format now, Minidisc is thriving, and rapidly becoming a standard in radio stations and other institutions around the world. With sound quality almost as good as DAT, and a range of editing features like Combine, Move, and Auto Cut, it makes an ideal choice for mastering on a budget. If Minidisc is for you, there's no better value on the market than the MDS-JE500, with digital input, jog dial and full function remote control as standard.



NEW PRODUCT
£269

MZ-R30 PORTABLE MINIDISC RECORDER

Now available in this compact portable version of the MDS-JE500 as featured above. This must be the nearest walkman you've ever seen!



RRP £399
£249

SV3800

INDUSTRY STANDARD DAT RECORDER

The Panasonic SV3700 has been the industry standard mastering DAT recorder, and is now superseded by the SV3800. Using 1 bit, 64x oversampled (equivalent to 20 bit), you can be sure of the highest possible analog quality. Records and plays back at all 3 sample rates via analog and digital inputs. Highly sensitive frequency wheel, AES/EBU and SPDIF digital connections, error counting and many other software features. In stock, now!



RRP £1291
£900

MT50

MULTI-TRACKER

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



RRP £389
£279

MT4X MULTI-TRACKER

The MT4X is Yamaha's top of the line machine and has a specialisation to go with it! It's logic controlled transport means that as well as two auxiliary sends and return to all 4 function, you also get a special 'release' mode so that you can practice drumming in and out as many times as you like, without rising, setting your groove in recording. Other great features include three band EQ on each channel, two auxiliary sends, LCD monitoring, double or single speed operation, and individual track outputs for use with an external mixer.



RRP £569
£379

*We will beat any genuine quote from a UK or European dealer. DPs may be able to substantiate the quote and the goods must be available and in stock. Prices include 17.5% VAT. UK mainland carriage. © 99 E & O E

EUROPE'S LOWEST

Zoom A JOURNEY TO THE MOON!

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



1202 TRUE STEREO FX PROCESSOR The 1202 is a full 19" rack unit, featuring true stereo 16 bit processing at 44.1kHz. The quality of the reverb alone would make it worth the price, but there's lots more: two simultaneous effects are offered, including delay, chorus, flanging, tremolo and pitch shifting, as well as various reverb types including reverse. If one of the 512 presets doesn't suit exactly then using the two parameter knobs will allow you to tweak the program until it does, and the addition of 2 band EQ will further tailor the sound to your mix.

- 16 Bit 44.1kHz True Stereo FX Units
- Great Quality Reverb & Multi FX
- Vocoder Effect and Mic Input on 1204

- Over 500 Different Presets
- Free Rack Unit & Cables Only at Turnkey!

RRP £149
£99



1204 TRUE STEREO FX PROCESSOR The 1204 builds on the success of the 1202 by adding MIDI control, 100 extra user presets for storing your own edits, and a two digit LED display. On top of this, there is also a rotary speaker effect, and a vocoder - a front panel mic input is even provided for quick and easy setup.

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

RRP
£199

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

XR300 SYNCHRONISER **TURNKEY EXCLUSIVE**

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

RRP £299
£159

STEREO VITALIZER ENHANCER/EXCITER PROCESSOR

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

RRP £569
£299

MIDIVERB 4 PRO QUALITY FX UNIT

The MidVerb 4's excellent Alesis effects algorithms produce dense, natural reverb-ation, rich Chorus and Flange, Delay and Pitch effects that are designed for professional use. There are thirty-two effects algorithms, and 128 Presets and 128 User Programs to choose from. Large backlit LCD, online help, MIDI control, trailer routing and programmable face-switch give you complete creative control. Choose £50 worth of cables absolutely free - only at Turnkey!

RRP £329
£289

INC £50 WORTH OF CABLES FREE

G4 ROTARY SPEAKER SIMULATOR **OVER 75% REDUCTION IN PRICE**

Ever wondered why you can't quite get your organ sounds to sound like a real Hammond? That's because half the secret of the sound lay in the special rotating Leslie speakers used to give the characteristic vibrato effect. The G4 allows you to control acceleration, speed, rotor / horn balance and even mic placement, giving a superb reproduction, complete with overdrive. Loads of creative uses including loop processing, guitars etc, as well as organs.

This incredible end of line clearance deal with a 75% reduction means they will sell out fast. Buy now to avoid disappointment!

RRP £399
£99

G5 SYNTH BASS PROCESSOR **OVER 80% REDUCTION IN PRICE**

The amazing G5 gives you instant access to all those classic analogue synth sounds also giving you the ability to create your own sounds from it's large tonal palette. Using special waveform characteristics it will also become a distortion/fuzz, octave divider or auto wah - making the G5 the most versatile bass processor ever!

This incredible end of line clearance deal with over an 80% reduction means they will sell out fast. Buy now to avoid disappointment!

RRP £349
£69

COMPOSER WORKHORSE COMPRESSOR

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

RRP £349
£199

dbx 1066 DUAL COMPRESSOR LIMITER GATE

DBX build on the success of their highly acclaimed dynamics processing range with the flexible new 1066. In addition to all the professional features expected from this respected brand, the 1066 offers switching between their patented "Overeasy" soft-knee and hard-knee modes, sidechain switching, ultra low distortion "Peak Stop Plus" limiting and meticulous US hand-built quality. A/B this product at Turnkey to hear why DBX remains an industry standard in signal processing.

NEW BOXED £479

266 DUAL COMPRESSOR GATE

Two channels of classic dbx compression with new Auto-Dynamic™ Attack and Release controls, program-adaptive expander gates, balanced inputs, precision LED metering and sidechain insert. Front panel selection of stereo or dual mono operation, all in a standard 1U rack design. Entire dbx range on demo at Turnkey!

RRP £229
£199

286A 'CHANNEL STRIP'

These days, in the age of MIDI and hard disc recording, most people tend to only record one audio track at a time, and have seen the value in investing in a good quality microphone. However, a mic is only as good as the circuitry you pass it through afterwards, and for some time, high end manufacturers have produced 'channel strip' style boxes which include all the essential acoustic recording processes in one device. Now the DBX 286A brings you a high quality mic pre amp, Over Easy compressor / de-esser, enhancer and expander / gate all in one device, offering you a premium quality signal path at a budget price. The ideal enhancement to any project studio!

RRP £229
£199

163A COMPRESSOR/LIMITER

Compressors and de-essers are an essential part of the recording process, but the previous models that many of them are fitted with can often lead to distortion and ending up with a worse result than you started with. The DBX 63A and 263A are designed to give you high quality results with total simplicity - a single control gives you 'more' or 'less', and the rest is all taken care of for you. The units are also ideal for portastudio and budget master owners, as they sport a front panel mic input, so no insert points are required. Buy one of each and get a free universal rack tray. Limited stocks only - order now to avoid disappointment!

RRP £109
£99

RRP £109
£99

263A DE-ESSER/COMPRESSOR

BUY THE 163A & 263A AND GET A FREE UNIVERSAL RACK TRAY

VTP-1 DIGITAL MIC PRE

The all new 2 channel VTP1 tube mic amp / EQ looks set to take the market by storm. It contains four bands of semi-parametric EQ with a high definition mic amp based around a proprietary valve design. Phase reversal, high pass filter, 20dB pad (five inputs also available) and 40v phantom power are provided, together with high quality balanced analog outputs, and AES/EBU and SPDIF outputs at 44.1 or 48 kHz. Ideal front end for any digital system.

NEW BOXED £999

VCS1 COMPRESSOR

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

NEW PRODUCT £799

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

STUDIO QUAD 4 CH. STUDIO FX PROCESSOR

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

RRP £529
£POA

PCP330 VOCODER

Freeform Analog Technologies FreeBass is already one of the most successful sound modules of the year, and now following hot on its heels comes the PCP330 ProCoder.

One of the most asked questions in the industry must be "Why doesn't anyone make a vocoder anymore?" - well here it is, with a fantastic feature list, great sound quality and a down to earth price. The carrier can be either an internal VCO or external line input, whilst both line and mic inputs are given for the modulator signal. Eleven filter bands each have their own level knob on the front panel giving true hands on control of your sound, and the sibilance (unvoiced) control also has an external input if required. The final output can contain any mix of modulator, carrier, vocoded signal and a special filtered version of the signal. Remember, this doesn't only create robot voices, there are thousands of creative uses, and it's also ideal for processing drum loops.

NEW PRODUCT £299

Order now and own an instant classic!

*We will beat any genuine quote from a UK or European dealer. RRP must be able to substantiate this quote and the goods must be available at the time. Prices include 17.5% VAT. E. & O. E. UK mainland delivery from £9.99

PRICES GUARANTEED



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

PREMIUM QUALITY VALVE OUTBOARD EQUIPMENT



The **RP583 Studio Tube Compressor / Limiter** has become an instant hit, offering as it does two channels (stereo linkable) of some of the finest sounding compression money can buy, with a smooth and natural compression characteristic. Ratio is continuously variable from 2:1 to infinity, and there are separate controls for attack, release, threshold and make-up gain. Dual VU metering is provided, as well as jack and balanced XLR ins and outs, and sidechain access is fully catered for. Ideal for a variety of instruments, vocals and complete mixes.

Processor. The all tube 2u box, features a premium quality transformer balanced mic pre amp with switchable 30dB pad, phase reverse and true 48V phantom power. The compressor has all the features of the RP583, and the exciter section adds a wonderful sheen to virtually any sound, as well as beefing up the bottom end. Each stage has it's own bypass switch, sidechain access is provided, and the large VU meter can monitor input, output, or gain reduction. No serious recordist should be without one!



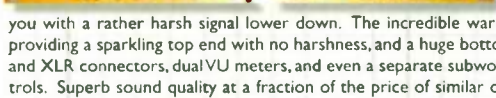
RP533 Studio Tube Multi-Processor
Whilst mixers these days are of a better quality than they used to be, to get the best possible signal to tape or disk, you can't beat a dedicated unit - and for value for money, you can't beat the Bellari RP533 Studio Tube Multi-Processor. The all tube 2u box, features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

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RP520 Studio Mic Pre Amp
A true dual tube mic pre amp at a bargain price, with tubes used at all the crucial gain stages, not just strapped across the outputs. Features include phase reverse, input and output pads, separate gain and output level controls, true 48V phantom power, jack and XLR outputs and dual VU meters. Bypass your desks mic amps and feel the quality!

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



RP562 Stereo Exciter
Traditional exciters usually do a good job of brightening up the extreme top end, but can often leave you with a rather harsh signal lower down. The incredible warmth of the Bellari Sonic Exciter ends all that, providing a sparkling top end with no harshness, and a huge bottom end to boot. The stereo unit has both Jack and XLR connectors, dual VU meters, and even a separate subwoofer output with it's own cutoff and level controls. Superb sound quality at a fraction of the price of similar devices.



MP110 Direct Drive Mic Pre Amp
Stand alone single channel tube mic pre amp.

PME4 PARAMETRIC EQ
Buy a pair for only £149
Not on the heels of last month's hugely successful PMEB deal, an opportunity to obtain the single channel version of the same, for a fraction of it's original price. The PME4 is a 1U rack featuring a single channel of fully parametric (cut / boost, frequency and 'Q') 4 band EQ, clearly laid out, and each control with its own knob. A second output is also provided with a 40Hz high pass filter for removing unwanted rumble etc.
Very limited stocks - first come, first served!

RRP £109
£79

362 SONIC MAXIMIZER
The 362 series delivers the sound-improving benefits of "Sonic Maximizer" technology with the convenience of ganged-stereo operation.
362NR SONIC MAXIMIZER & NOISE REDUCTION only £199
362SW SONIC MAXIMIZER & SUB WOOFER CONTROL only £169

RRP £199
£169

4 POLE FILTER
The 4 Pole is the legendary Microwave / Wave 24 dB lowpass filter. You are free to apply this filter to any audio signal that you patch into the Filter. So if your favourite sampler or sample player lacks that special quality, you can give it a sonic boost via the 4 Pole Filter.
It is the most powerful (and quite possibly the only) analog filter available today.

NEW BOXED
£269

MODEL 316 SEMI-PARAMETRIC EQ
Speak Electronics are pleased to announce for the ultra high quality broadcast mixers that they manufacture.
The Model 316 is a 3U rack offering 16 channels of 3 band semi parametric EQ and was originally designed for their high end sub mixer the EXtreme CX. Each band features up to 15dB of boost or cut and frequencies of 50Hz, 500Hz (low), 500Hz-5kHz (mid), and 5kHz-15kHz (high). This is a unique opportunity to upgrade the EQ on your mixer to a standard that is not found on many professional consoles. Ideal for Mackie's CR1604, Samsun's MPL2242 etc.

RRP £799
£349

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

NEW PRODUCT
£439

OUTBOARD NEW, USED & EX DEMO

Alesis 3630	£149	BBE 462	£279	Lexicon ALEX	£249
Alesis MICROVERB4	£198	Behringer Composer	£199	Lexicon LXP15II	£699
Alesis MIDIVERB4	£100	Behringer Duallex	£119	Lexicon REFLEX	£289
Alesis Nanoverb	£99	Behringer Intelligate	£219	SPL MIKEMAN	£389
Alesis QUAD2	£499	Behringer Multicom	£219	SPL Vitaliser Stereo	£299
APHEX-104	£199	Behringer Ultraflex	£189	Yamaha REV100	£179
APHEX-108	£219	BOSS RV70	£189	Yamaha REV500	£299
APHEX-109	£367	BOSS VT1	£199	Yamaha SPX900	£549
BBE 362	£175	LA GCX2	£155		

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 5 products are:

The Focus - 4 band parametric EQ with filters.

The Dual Mic Pre - an audiophile quality dual channel mic preamp.

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!

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

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

All 5 are on permanent demo at Turnkey.

RRP
£819
DUAL MIC PRE

RRP £999
£POA
FOCUS EQ

RRP
£989
VOICE-BOX

RRP
£1049
COMPRESSOR

RRP
£1029
CHANNEL STRIP

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

EQ1 TL Audio Parametric EQ

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

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

RRP £821
£499

MPX 1 Lexicon

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 MPX1. Featuring the famous 'Lex' chip for reverb and separate DSP processor for multi FX, the MPX-1 brings you all that is good in signal processing for under £1200 inc VAT! Up to 5 simultaneous effects are available including pristine quality stereo pitch shifting, and effects can be "morphed" from one algorithm to another, as pioneered in the Vortex. All new operating system includes on-line help and database for storing presets. Achieving quality results is as stress free as possible.

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

RRP £1499
£999

PCM80 EFFECTS PROCESSOR

The PCM80 effects processor has state of the art audio quality with true stereo processing, amazingly detailed editing including MIDI clock control and a card slot. Cards include: Dual FX, Pitch FX and the Martin Garshin card.

CALL TURNKEY PROFESSIONAL ON 0171 240 4036 FOR DETAILS

RRP £2199
£1899

ALEX EFFECTS PROCESSOR

If you're looking for a straight reverb unit, Lexicon have a reputation that's hard to beat! These are the cheapest units to offer the famous 'Lex' sound - The Reflex has the additional benefit of dynamic MFX, allowing real time control of multiple effects parameters. Huge discount only at Turnkey!

REFLEX ALSO AVAILABLE WITH MIDI CONTROL only £299

RRP £399
£249

We will beat any genuine quote from a UK or European dealer. We must be able to supply the quote and the goods must be available and in stock. 17.5% VAT E & O E. UK mainland carriage from £9.99

EUROPE'S LOWEST



A DIGITAL HURRICANE IN YOUR PC?

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

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

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

Other upgrade options include a synth daughter-board (eg DB50XG), cable for MIDI interface, and S/PDIF daughter board allowing direct digital transfer to/from DAT, CD player, MiniDisk etc... (£99 for either card). The Pinnacle is bundled with Voyetra's D.O.P. sequencer which gives up to 16 audio tracks with digital effects (eg reverb, delay...) depending on hardware specification.

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



FREE DIGITAL ORCHESTRATOR PLUS WITH PINNACLE (WORTH £129)



ZIP REMOVABLE DRIVE

INC. DISK & 25 PIN SCSI CABLE

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

RRP £219
£149

SIBELIUS-7 TOP-END NOTATION V3.0

Why do so many music academies use a program which doesn't work on the PC or Mac? Because for professional notation typesetting, nothing else comes close. In a totally different league from anything else - Paul Patterson, Royal Academy of Music, Future Music Platinum award. We are now an Acorn Authorised Dealer, we stock and demonstrate the exciting new RiscPC computer, running Sibelius-7 powered by the 200 MHz ARM Processor, and with optional 486 or 586 board for running Microsoft Windows software.

Call Geoff for DEMO. One to one tuition also available upon request.

FROM ONLY
£499

TURNKEY PENTIUM PC

Two things we've noticed over the last year is the enormous growth of the PC hardware market (as more and more people become PC owners), and the unfortunate proliferation of sub-standard hardware. Our response to this is the launch of the new Turnkey PC. Based on carefully chosen components, this works-a-machine will not let you down, and offers a specification which will not restrict your options, either now or in the future.

Turnkey PC + MIDI/Midi D/Plan + Digital Orch £1,549
Turnkey PC + Pinnacle + Digital Orch £1,859
Turnkey PC + Fiji + Cubase 3.0 £1,899
Turnkey PC + Pinnacle + Cubase 3.0 £1,999
Turnkey PC + Audio/Midi + Logic Audio £2,199

Intel P166mmx
512k cache
32 MB RAM
2 Gb HD
12x CD

Optional upgrade to P166mmx chip, 1" and 17" displays, SCSI cards and CD-R drive

CAKEWALK PRO 5
WHEN PURCHASED WITH FIJI OR PINNACLE
£149

Logic AUDIO
WHEN PURCHASED WITH FIJI OR PINNACLE
£349

CUBASE version 3.0
WHEN PURCHASED WITH FIJI OR PINNACLE
£239

PINNACLE

INC. FREE DIGITAL ORCHESTRATOR PLUS

£479

FIJI

A PINNACLE BUT WITHOUT SYNTH & SAMPLESTORE

£349

MUSICTIME NOTATION ARRANGER

MusicTime has been our best selling music package for 4 years. Based around the industry leading "Enigma" software (as used by Disney, and many film & TV producers), it allows you to perform all editing functions without leaving the notation environment, making it simple and clear to use, especially for those with some classical music training.

Keyboard Reverb - Overall I find MusicTime an extremely well thought out program as well as being versatile, user friendly and very good value for money. As a music type-setting package I have no hesitation in giving it the highest recommendation. (rated 9/10, Diamond Award).

With MusicTime Deluxe, you get both CD-ROM and floppy versions in the box, and many more features including part extraction, cross-staff beaming, correct playback of samples (e.g. DC Code etc), and automatic part extraction. Also includes a free SoundMaster™ type MIDI interface cable.

RRP £99
£79

RRP £129
£99

CAKEWALK v6.0 GREAT NEW VERSION IN STOCK

The 16 bit sequencer races ahead with new version packed with killer features: 10 or more audio tracks (processor dependent), Realtime effects (reverb, flange, EQ, chorus, delay, up to 4 at once), Time compression, pitch-to-midi conversion, support for Microsoft DirectX Audio Plug-in, 16 bit VST, CW Pro 6 can completely control a Yamaha, PreSonus or M-Audio 60/series, or you can design your own mixer screen.

RRP £349
£329

BAND-IN-A-BOX INTELLIGENT ARRANGER v7.0

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

#1 SELLER
£89

DIGITAL ORCHESTRATOR PLUS DIGITAL AUDIO SEQUENCER

D.O.P. allows recording or playing of independent digital audio tracks synchronized with MIDI tracks. The number of digital tracks is limited only by a user's hardware. Full drag and drop digital audio editing features are provided, as well as unlimited bouncing of tracks and support for multiple sample rates import & export of WAV files. Audio Transforms include digital delay, chorus and flange to tighten up tracks; noise gate, limiter and compressor options to remove unwanted noise and alter dynamics; and echo, reverb, reverse and filter/eq-endo.

NEW
£129

SOUND STUDIO GOLD AUDIO SEQUENCER + EFFECTS

As £149 Sound Studio Gold is the cheapest hard-disk recording sequencer with extensive digital effects. Based on the popular "Tambora" digital audio engine, Sound Studio Gold adds reverb, echo and other real-time effects, plus a heap of useful features like loop-in-recording, AVI support for Video playback, and notation printers. Features: 16 Audio Tracks (mono or stereo) • Audio Record while playback • Audio Track Bouncing • Realtime Reverb • 256 MIDI Tracks • Large Time display • AVI Support • Lull and Right Master Level Indicators • VU meters for audio input/output.

NEW ONLY
£149

16 BIT DUPLEX DIGITAL AUDIO RECORDING

This 16 bit card has much lower noise levels than similarly priced cards, and allows full duplex recording/play on fast 486 or Pentium computers. Also with Cubase 3.0 Digital Orchestrator, Sound Studio Gold etc... Built-in MIDI interface (cable included in the price), and connector for optional 4-pin/5-pin daughterboard. Really really easy installation with Win95 (Plug 'n' Play). After putting the card in, switch the PC on, and insert the disk, when prompted. Takes about 90 seconds (a bit longer if you already have a sound card). Buy with Cubase - £399, with Digital Orchestrator - £275.

RRP £249
£189

CUBASE 3.0 PC

The industry standard PRO sequencer is now even better value than ever! Version 3 now includes hard disk recording (but that work was virtually any standard). Score version only £449. Fine upgrade to VST PC version when available.

CUBASE VST MAC

As well as all the great sequencing and audio recording facilities you've come to expect from Cubase, Power PC owners can now take advantage of up to 32 audio tracks, complete with built in digital EQ, DSP, reverb and FX! **Score version only £449**

EACH
£329

MIDIQUEST 6.0 UNIVERSAL PC EDITOR LIBRARIAN

MIDIQuest is the most powerful, flexible and comprehensive editor/librarian around with support for the widest range of MIDI devices including XP50, JV1080 series, Morphosis, UltraProbes, MUSO, MUBO, Quest/verb Plus, GT, Classic Keys, TD-7, KT76, KT88, Korg X5, DPM3 and many others. Driver upgrades are generally free of charge, so MIDI-Quest will last for as long as MIDI is around! It's a really great investment. New version comes on CD-ROM and is fully Windows 95 (ie 32 bit).

RRP £295
£199

MIDI INTERFACES FOR PC COMPATIBLES

Gameport Cable	fits any Soundblaster™ type card	£25
MIDI Link	1 in, 1 out serial interface for notebooks	£69
MPC401-II	1 in, 1 out MIDI card with Waveblaster	£65
Winman 3a2	2 in, 2 out MIDI card for Windows only	£79
Portman 2a4	2 in, 4 out parallel interface for notebooks	£119
MIDI Edge 1x4	1 in, 4 out MIDI card with Waveblaster	£129
WinMan 4x4	4 in, 4 out MIDI / SMPTE card for Windows	£219
PortMan 4x4	4 in, 4 out MIDI / SMPTE for Parallel port	£219

REBIRTH RB-338 SOFTWARE SYNTHESIZER

If you're into techno, trance, ambient, hardcore, you simply must have the sound of a 193 in your arsenal of sonic weapons. As it's been out of production for well over a decade, these still so essential are collector's items. They'll cost you an arm and a leg which has opened a market for clone products. The Rebirth RB-338 is a CD-ROM which gives you two 303s and one 808 - a software recreation of these two classic pieces of analog hardware. All the quirks and subtle qualities of the real thing are there, with full MIDI and sync capabilities. No cables, no boxes, all you need is a Mac or a PC.

NEW PRODUCT
£149

PRICES GUARANTEED*



Audiowerk8

- 2 Ins, 8 Outs and Digital I/O on 1 Card
- Use 2 Cards in the Same Computer
- Optional Multichannel Digital Interfaces
- Comes with VMR Software Bundled Free

Every now and again products like Tascam's first portastudio and the Alesis ADAT come along and revolutionise the recording market. Emagic's new Audiowerk 8 is now set to bring multichannel computer hard disk recording within reach of everyone.

For an incredible £499 including VAT, you can now buy a PCI card for Mac or PC, which gives 2 analog inputs, 8 analog outputs, and SPDIF digi I/O as standard! You even get Emagic's new Virtual Multitrack Recorder software thrown in!



Audiowerk8
A Channel Digital Hard-Disk Recorder

Virtual Multitrack Recorder

The bundled VMR software gives a clear virtual representation of an 8 track tape recorder, making operation incredibly straightforward. Multiple takes can be recorded per drop, and your favourite version selected afterwards. The large smooth scrolling waveform display makes editing a doddle!

This is just the start of the good news though - the Audiowerk 8 integrates seamlessly with Logic Audio on either platform, you can use 2 cards in the same computer to give 24 track recording with 16 outputs, and a daughter board socket will allow future options like an ADAT 8 channel optical digital i/o, or 4 extra stereo SPDIF outs! The card is only 7" long, so it fits in virtually any machine, and uses state of the art bitstream converters for pristine sound quality. The card is on permanent demonstration at Turnkey, and the first 50 purchasers will receive a free loom for connection to your mixing desk. Call us now!

HARD DISK RECORDING BREAK-THROUGH

NEW PRODUCT
£499
INC FREE 8 WAY LOOM

S3000XL INC FREE ZIP DRIVE & 16 MEG AKAI WORKHORSE SAMPLER

AKAI continues its tradition of supplying workhorse samplers to the studio market with this sturdy offering. The compact 2U rackmount machine features 32 note polyphony, 10 outputs, 2 meg expandable to 32 with SIMMS, SCSI as standard, MESA editing software, and a whole range of expansion abilities including digital i/o and an extra filter board. Buy from us and get 16 meg and a ZIP drive free!

NEW BOXED
£1799

S2000 ENTRY LEVEL SAMPLER

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

RRP £989
£899

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

- IB208P 8 outputs & dig i/o for S2000 £399
- IB304F 2nd filter board for S2000/S3000XL £349
- EB18 multi FX board for S2000/S3000XL £349
- EXM3008 8 meg expansion for S2000/S3000/S2000/CD3000 £549
- EXM008 8 meg expansion for S1000/1100 £499
- IBM208P 8 outputs & dig i/o for MPC2000 £249
- IBM07V monitor output board for DR8/DR16 £499
- IB804EX 8 in 16 out ADAT interface for DR16 £399
- IB803M MIDI interface for DR8/DR16/DR16 £199
- IB802T SMPTE board for DR8/DR16/DR16 £249

MPC 2000 SAMPLING DRUM MACHINE

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

RRP £1499
£1175

REMIX 16 SAMPLING UNIT

AKAI are world leaders in sampling - just try finding a 16 channel rigid without one of their machines - and now they have brought that expertise to the DJ market. 16 pads trigger fully utilised sample lines while the removable mixer fader (with transform buttons) fades between the deckline mixer and the sampler. There are far too many features to list here - but if you want to take your mixing to a higher level, this is the tool to do it.

RRP £999
£599

DJ-70 MkII UNDER HALF PRICE! ROLAND SAMPLING WORKSTATION

With the introduction of the DJ-70MkII, Roland have finally made sampling DJ friendly. A complete sampling workstation, the DJ-70MkII features top quality sampling as in their professional studio models, powerful processing, including excellent resonant filters for great analog style sounds, 8 track sequencer, 3 octave music keyboard, play pads for drums and loops, and a scratch dial. The basic memory of 2 meg is expandable up to 32 meg and up to 24 samples can be played simultaneously. Any DJ-70MkII bought from Turnkey comes with free access to our extensive Roland sound libraries. Call in for a demo today!

RRP £1699
£799

MU10 GM SOUND MODULE

The Yamaha D850XG daughter-board took the market by storm. Yamaha release the MU-10 essential sound-card! No more sound-drivers, no I/O conflicts, no DMA problems... just connect to the serial-port (cable included) and install the software. This beats even the best plug-in-play cards FOR SOFTWARE. Yamaha wouldn't settle for the "loading files" programs often thrown in with lesser products. Yamaha's brand-famous Cubasis (not Cubase Lite). Also you can route any sound through MU10 effects!

RRP £199
£189

CLUBMAC EIGHT SPEED CD-ROM DRIVE

If you want access to large amounts of sample library in a library, then there's no better way to do it than via CD-ROM. Hundreds of discs are now available full of everything from orchestral instruments to hip hop loops, all ready prepared to load into your sampler. In theory SCSI is SCSI, but in practice it's just not the case, particularly when it comes to samplers. Drives that function perfectly with one machine will often flatter badly to work with another. So we've taken the guesswork out, and come up with a bargain priced CD-ROM drive that works with all current Akai, Emu and Roland machines, and what's more, it runs at the normal speed, for ultra quick loading. Guaranteed to work! (Please specify which sampler when ordering)

RRP £329
£189

E6400 SAMPLER

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

RRP £2499
£2299

AUDIOMEDIA II STEREO HD RECORDING CARD

Turn your Mac into a Hard-Disk recording system with the AudioMedia II which comes with Sound Designer II non-destructive editor software. Features stereo in and out (both digital and analog), out SMPTE sync, as well as real-time compression. Parametric EQ 1 Pitch Shift and Time Stretch.

RRP £999
£299

SAMPLE LIBRARIES

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

Check one out today!
PRICES FROM
£19

ESI32 + SCSI SAMPLER WITH V2.0 SOFTWARE

Featuring 32 note polyphony, 4x polyphonic G clip resonant filter, huge quality library (Akai and Emu's) (optional) Time-stretch doppler FX, parametric EQ, exciter, etc. All Emu samplers come with free access to our smart out sample library (we have all the EMI library on CD-ROM) and excellent tech support (many staff are owners).

RRP £1199
£899

NEW SAMPLER WITH 32bit interface, 16 speed 120MB drive, 24pins and 16MB of Main Bus & CD for the installation are in only
£1199

CALABARI MULTI-OUTPUT BOARD NOW AVAILABLE only £385

CDR400 NEW CD RECORDER

With recent advances in computer technology, your computer can now be your mixer, multitrack and effects unit all in one. The Yamaha CDR-400 is the next step, letting you write your CD-RW disk without hitting the computer's desktop. It's also internally well connects via SCSI. Includes free WinCD-Pro 3.0. Also works well with Steinberg WaveLab 1.6. Is your CD fast enough? Give us a call!

NEW! NEW!
£599

Ask about Adaptec SCSI cards, 1542, 2920, 2940

COMPUTER NEW USED & EX DEMO

Calabark Home Str	£78	Steinberg Cubase 3	£289	Turtle Beach Tropex	£269
Cubase Score Mac	£478	Turtle Beach Fiji	£369	Yamaha D850XG	£99
Audiowerk	£499	Turtle Beach Pinnacle	£479	Yamaha MDF2	£249
MOTU MIDIEXP XT	£399	Turtle Beach TBS2000	£169	Yamaha MU10XG	£189

SAMPLER NEW, USED & EX DEMO

Akai CD3000H	£1599	Akai S3000XL	£1637	Emu E532 SCSI	£799
Akai MPC 600	£399	Emu E64	£1899	Kurzweil K2500	£2499
Akai S20	£454	Emu E6400	£1985	Roland OP760 1P	£149
Akai S2000	£700	Emu E542	£750	Roland S760	£899

SU10 SAMPLING UNIT

Yamaha's SU10 is a ground breaking unit, mixing professional quality stereo sampling available to everyone. Up to 34 seconds of sampling is available and 48 samples can be held in memory at any one time. Samples can be filtered, reversed, scaled, crossfaded, pitchbent and even scratched using the ribbon sampler. The built in sequencer means you can produce your own music using just this unit! The SU10 comes bundled with 2 free Time & Space CDs containing almost 800 samples.

RRP £299
£269

ALSO AVAILABLE WITH 3 OCTAVE MIDI KEYBOARD only £324

*We will beat any genuine prices from a UK or European dealer. We may be able to discount the price and the goods must be available and in stock. Prices include 17.5% VAT. E & O E. UK mainland carriage from £9.99

EUROPE'S LOWEST



A3000 SAMPLER



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

- 64 Note Polyphony as Standard
- 4 Outputs Expandable to 10 + digi i/o
- Reads Akai and .WAV Format Files
- Memory Expandable to 128 meg

AN1x VIRTUAL ANALOGUE SYNTH



The analogue emulation market is hotting up with this exciting new release from Yamaha. Building on the incredible success of the CS1x, the AN1x is built on the same design principles, but uses technology from the groundbreaking VL range to produce stunning virtual analogue sounds. With a 5 octave aftertouch sensitive keyboard, 10 note polyphony, 8 knobs and a ribbon controller, and built in effects, the AN1x is sure to be an instant hit. Demand will far outstrip supply - get your order in early!

- Amazing Low Price for Polyphonic Modelling
- 10 Note Polyphony
- Front Panel Knobs all Send MIDI Controllers
- 5 Octave Velocity & Aftertouch Keyboard

BLUE MEANIE INVASION!

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

NEW PRODUCT
£1299

TECHNOX SOUND MODULE

If you need to get your hands on some top quality dance sounds on a budget, look no further than Quasimidi's Technox. All sounds can be edited via the LCD display and two front panel dials, which are also used for sound selection - sounds are divided into groups to make it easy to find the one you want. 16 part multitrack and always 24 note polyphonic with built in effects, it makes a perfect addition to an existing MIDI setup, but is comprehensive enough to use on its own, and the superb arpeggiator means you'll never get bored! Call for a free demo CD. Money back within 7 days if not satisfied (ask for conditions).

NEW LOW PRICE
£399

RAVE-O-LUTION 309 DANCE WORKSTATION

The Rave-O-Lution 309 is undoubtedly Quasimidi's best and most innovative product to date. Imagine the raw powerful sound quality of Roland's TR909 and TB303, give them 50 times as many sounds, add resonant filters to the drums, and you're still only got half the instrument that is the Quasimidi 309! Knobs for all functions all send out MIDI controllers, built in real-time and step-time sequencer, 2 on board effects processors & EQ, optional rack ears, typical German build quality - far too many features to mention here! The ultimate dance production workstation, must be heard to be believed. "superb bass synth... excellent drum sounds... one of the most immediately useable products on the market" - Sound On Sound

Call for a free demo CD. Money back within 7 days if not satisfied (ask for conditions).

RACK EAR? ALSO AVAILABLE only £35
NEW PRODUCT
£649

QUASAR SOUND MODULE

Quasar's first ground-breaking product, and still a stormer! The simultaneous use of multiple types of synthesis including Analog Emulation and FM, give this module a huge range of sounds from standard General MIDI tones through their famous dance sounds (including 909 etc) to incredible special effects. Huge LCD and dual digit LED displays in conjunction with a plethora of front panel knobs and buttons make use of the comprehensive editing facilities chime's play. 2 MIDI inputs, 6 audio outputs, always 28 note polyphonic, and superb onboard effects and arpeggiators. Two sound expansions are also available to turn it into the ultimate dancefloor machine - Hardcore and Techno, both only £169. Sorry, no demo CD available of this one, but take our word for it, it sounds the business! Money back within 7 days if not satisfied (ask for conditions).

JV1080 SYNTH MODULE

In the same way as the S1000 became the industry standard sampler, Roland's JV1080 has become the industry standard synth module. It's not hard to see the reason why - straightforward operation combined with top flight sound quality and a huge range of usable sounds. But expandability of the machine is where it really comes into its own. There are over 10 different expansion boards which can be fitted (up to 4 at once), each one with as much ROM as the original machine, covering sounds from Vintage to Orchestral and Dance to World. At Turnkey we have the full range in stock, as well as an unbeatable price on the machine itself. Buy with any four expansion boards for only £499 extra!

NEW PRODUCT
£899

JV2080 SYNTH MODULE

The Roland JV1080 has become the industry standard sound source for home studios and professional use. It's superb sound quality, 64 note polyphony and expandability were a winning combination. Now the new JV2080 builds on that success by offering a giant editing screen, three independent effects processors as well as reverb / delay and chorus, and 8 of Roland's renowned expansion boards - the potential is virtually limitless! Judging by the success of the JV1080, these will be in strong demand - call us now! Buy with any four expansion boards for only £499 extra!

RRP £1109
£869

NEW PRODUCT
£799

SYNTH MODULES EMU



EMU have taken their wealth of experience in making modules such as the Proteus, Vintage Keys and Morphus, combined it with the filters from the incredible Emulator 4, and with their usual innovation, come up with the Orbit, Planet Phatt and Carnaval. The Orbit is a treasure trove of classic drum sounds, pulsating rhythms, arpeggiated beats, as well as a huge variety of hits and effects. Planet Phatt brings a new dimension to swing, and the Carnaval is filled for dance grooves as well as Latin specialties. The inclusion of the E4's 16 different types of 6 pole filters mean that these modules have more power to filter than any other synth. Finally the BEATS MODE includes a wide selection of tempo and groove effects which can filter them from changed - instead tempo change and vice versa, and even their sounds too! V2 software now gives improved bass notes and other enhancements. Orbit upgrade available for only £69.

RRP £869
£749

MATRIX 1000 SYNTH MODULE Oberheim

New almost 10 years old, and still sounding as fresh as the day it was released. The Matrix 1000 is essentially a Matrix 6 in a rack with 8 modules. Matrix 6 is a 6 note polyphonic, 2 oscillators per note, live mixing VCF filters with 8 modcs. Matrix 6 modification with 30 sources and 32 destinations, raw gritty analog sounds. Why 1000? The 1000 presets were generated by Matrix 6 owners worldwide in response to a competition to find the best and best 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 master! Fully editable via MIDI, Mac, PC or Atari editor (available for only £49).

RRP £599
£399

PROGRAMMER FOR MATRIX 1000 OR MICROWAVE ACCESS

There's no doubt that the Oberheim Matrix 1000 and Waldorf MicroWave deliver powerful, exciting sounds. However, when it comes to programming your own sounds, top producers find it a bit of a pain. Because each module and filter has its own controls, it's very difficult to create new sounds. The Access programmer gives you the best of both worlds - now you can create impressive and new sounds using your own ideas, and still have the Matrix 1000 or MicroWave to play with.

EXCLUSIVE
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PMA-5 HAND HELD COMPOSER Roland

This incredible Palm Top computer allows you to compose while you travel with the benefits of Roland sounds. The infinity user interface can be manipulated with the individual touch pen giving you control over all 100 individual sounds and 16 drum kits. Compose up to 30 songs with 21,000 notes in the synthesizer, on the drum or during each Four Mixes. Tracks, Four Bedding Tracks, 100 preset styles with 16 patterns. Chordoline and store 200 of your own patterns. Up to 400 Presets total to work with. Great for practice or live performance accompaniment. A great portable partner for your Laptop.

RRP £445
£369

MSE1 & MVS1 SOUND MODULES

Scrumptious and of live drummers that on these superb Roland quality sound modules - have a standalone module for less than the price of a JV1080 expansion card! Both are 8 part multitrack, 28 note polyphonic, and have dual 20 bit FX processors. The MVE1 has all the classic analog sounds from Japan's ARP to Phog, and the MSE1 has the tubular string patch and classic solo sounds you're likely to hear anywhere and everywhere. Sides will not last long - get your order in now!

RRP £469
RRP £469
£199
£239
MSE1 MVE1

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Alai SGO1P	£149	Korg ISOR	£289	Roland MS21	£189
Alai SGO1V	£149	Kurzweil K2000B	£1149	Roland MYS1	£239
Alai SR18	£189	Kurzweil K2000R	£1299	Roland PMA5	£315
Boas DR5	£249	Kurzweil KMP1	£349	Roland SC80VL	£399
Boas DR60	£249	Novation BaseStation	£299	Yamaha M101	£149
Emu Carnaval	£725	Roland 1080 Expansion Boards		Yamaha M200	£399
Emu SCMPHEUS	£799	Emu S99	£199	Yamaha M300	£349
Emu Orb1	£725	Roland JV1080	£899	Yamaha P50	£269
Emu Planet Phatt	£725	Roland MC303	£449	Yamaha OY225	£249
Emu UltraProteus	£329	Roland MOC1	£199	Yamaha OY700	£799

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Analog Modelling not only produces superb emulations of the great synths of the 60's and 70's, but also totally unique timbres never before heard. Realtime control is excellent, and all knobs, sliders, buttons and the ribbon controller send out Continuous Controller messages. For instant creativity, a powerful arpeggiator and real time phrase synthesiser are included, which can be easily synchronised to an external MIDI clock. This is very likely to be the hottest synth of '97 - order now!

- Superb New Analog Modelling Synthesis
- Unrivalled Realtime Control
- Highest knob Count Around for Easy Programming
- Built in Arpeggiator and Realtime Phrase Synth

RRP £1499
£1199

XM1 & XMc1 ORGAN MODULES

 HAMMOND
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£999

BASS STATION BUDGET MONO SYNTH

 novation
END OF LINE CLEARANCE EXCLUSIVE TO TURNKEY
 If you need to get into analog synths on a budget, then the Bass Station keyboard is for you. But this is no mere toy! Two oscillators, pulse width modulation, two 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. An ideal addition to any MIDI setup!
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£219

PULSE MONO SYNTH

 waldorf
 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 produce some of the finest sounds around, and a modulation matrix allows a far higher degree of programming complexity than anything else in its class. Add to this the fact that adding any parameter sends out a MIDI controller and you have a fantastic all round performer.
 RRP £499
£499

DR-660 DR. RHYTHM DRUM MACHINE

 BOSS
 BOSS have been making Dr. Rhythm drum machines since the early eighties, combining efficacy for entry and ease-of-use with the basic drum and percussion sounds. The DR-660 builds on the success of the DR-550 MK2, but offers 16-bit velocity and uttermost versatility: 4 separate out-boards (at this price), and 255 drum sounds including the best of TR808 / 909. The 660 also boasts the human feel control first introduced on the RB which allows velocity to control a real-time relationship between several velocities. From your snare, with on-board digital reverb and chorus, fully editable, with individual effect send control for each drum sound.
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£299

SUPER BASS STATION NEW MONO SYNTH

 novation
 Novation's Bass Station Solo has been one of the most successful monosynths ever, and now they take the concept one further. Three oscillators give extra fat sounds, whilst ring modulation and oscillator sync along with noise and distortion generators give it a hard edge when required. Even the MIDI spec benefits from LFO to MIDI clock sync, and there's an arpeggiator. Initial stocks very limited - get your order in now.
 NEW PRODUCT
£499

PULSE PLUS MONO SYNTH

 waldorf
STOP PRESS! NEW LOW PRICE
 The Pulse Plus has all the features of the Pulse but with audio input, CV and gate control! You can even use your guitar through it! The same sounding monosynth around that got better - check one out today!
 NEW
£699

SR-16 DRUM MACHINE

 ALESIS
 The SR-16™ Stereo Drum Machine is an excellent tool for experimenting and performance. It features a great selection of 233 sounds, offered both in dry level and with reverb. Alesis's exclusive Dynamic Articulation™ feature enables a drum sound to change its timbre as it's played harder for truly realistic performance. The SR-16 has over 200 preset patterns that were actually played in by top studio drummers - just tap programmed the drumset. Of course, the SR-16 also provides complete MIDI implementation, a fast-scan LCD, flexible programming and editing features and velocity-sensitive pad buttons.
 RRP £299
£189

SC88-VL SOUND MODULE

 Roland
 Based on the original Sound Canvas module but with much more of everything, the SC88 is 32 part multi-amping with two independent MIDI ins, also 44 note polyphony for handling virtually any MIDI stream at its. Having twice as much sample ROM too, the SC88 is really like two SC55s, except with 18 bit D/A conversion, offering the same audio quality as the JV-1080 synth. Choose from a CS3 GH compatible sound palette of 454 individual sounds, and 24 drum kits. The built-in interface for Mac or fast PC provides further value for money.
 RRP £649
£369

MICRO PIANO PIANO MODULE

 KURZWEIL
 The MicroPiano is the most highly regarded piano module on the market, featuring Kurzweil's breathtakingly realistic true stereo samples - 32 note polyphony means you won't suffer from interesting and the wide range of other keyboard sounds will surely make it useful in many other situations. Built in effects including very high quality reverb mean there's no need to tie up another effects unit. Surprisingly limited quantities at this price mean that stocks won't last long. Order today - you won't be disappointed!
 RRP £599
£349

FAT FREEBASS TB303 CLONE

If you need the unique sound of an original Bass Line™, but can't afford the inflated prices that go with it, then Freeform Analog Technologies' Freebass is the product for you!

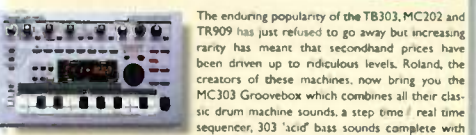


It's the only authentic sounding TB303™ clone on the market, and it's got MIDI! 1U rack with 1 knob per function, all the sound controls of the 303 are duplicated, Cutoff, Resonance, Envelope Mod, Accent, Tune and Decay. Waveform is continuously variable from square wave to sawtooth, and an auto tune button is included to retune the oscillator - no more continual drifting!

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

- Superb Sounding TB303™ Clone
 - Fraction of the Price of an Original
 - External Input to the Filter
 - Exclusively Available at Turnkey
- NEW PRODUCT
£199
FACTORY DIRECT

MC-303 GROOVEBOX DANCE WORKSTATION



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

ALSO AVAILABLE WITH MK149 MIDI KEYBOARD only £599

MICROWAVE II WAVETABLE SYNTHESISER



The Microwave II combines all the famous features of the original Microwave together with today's requirements for user interface, signal to noise ratio and sonic purity. It's simplicity of use is obvious with the use of just 5 rotary dials and a 2x40 character back lit LCD. On the back the Microwave II has 2 fully modulatable stereo outputs (configurable as 4 monos with panning). Tone generation comes from a powerful DSP generating wavetables, the 10 voices each feature two oscillators, 2 wave generators, a mixer, two filters in series, a stereo amplifier, four envelopes, 2 LFO's, a modulation matrix with 16 slots and several 'modifiers', more than enough to keep even the most demanding programmer satisfied!

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WK-1500 76 NOTE MIDI WORKSTATION KEYBOARD

INC FREE STAND, HEADPHONES & PSU

This TOP OF THE RANGE Casio has 128 sounds, 100 auto accompaniments and a 76 note keyboard. It is also fully General MIDI compatible and all 16 MIDI channels can be controlled from the keyboard. With an onboard six track sequencer all your songs can even be recorded on the instrument itself. This is unbelievably good value for such a great instrument.

RRP £549 £299

MASSIVE DISCOUNT SAVE OVER 45% ON PRICE

K5000s ADDITIVE SYNTH

In this age of many 'soundlike' sample + synth keyboards, it's not often you get something coming along with a completely fresh approach. Kawai have dared to be different though with the K5000s and reintroduced additive synthesis. This has been tried in the past, but the limited DSP power has severely curtailed the possible results. The only method of synthesis that can theoretically produce any possible sound, additive has a palette which ranges from superb acoustic simulation, to timbres quite unlike those offered by any other synth. The inclusion of a traditional synthesis section complete with an incredibly powerful filter means it's also a cinch to create fantastic analogue style sounds, and a generous complement of knobs which all send MIDI controllers add to the ease of use. Far too many features to mention here - call for more information or for a demo.

NEW PRODUCT! £1299

RACK VERSION ALSO AVAILABLE only £999

XP-10 MULTITIMBRAL SYNTH

INC FREE STAND, 'PHONES & CABLES

Fantastic dial music this is the most affordable pro keyboard on the market. Take Roland's legendary sound via, add a ducist live octave keyboard an arpeggiator and innovative arpeggiator features like sound morphing and you have the XP10. Fully General MIDI compatible for all your synths the XP10 comes bundled with a free stand, headphones and cables only at Turnkey.

RRP £499 £399

THE RAVEN KEYBOARD DANCE WORKSTATION

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

NEW PRODUCT £999

QS6 EXPANDABLE SYNTH

The QS6 64 Voice Expandable Synthesiser starts with a powerful 64 Voice synth engine, powered by BMB of sound ROM which is expandable to 16MB, either through the large range of Alesis QuadraCards, or blank Flash RAM cards for use with the free Alesis Sound Bridge sample transfer software. There are 640 programs and 500'memes', including a complete GM bank. Built-in serial port for direct interface to a computer, and free CD-ROM filled with sequencers, editors, song files, and samples which turn the QS6 into a complete music work station. Call now for more details, and find out about one of the most underrated synths on the market.

RRP £999 £649

QS7 ALSO AVAILABLE only £899

XP-50 WORKSTATION KEYBOARD

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

RRP £1499 £POA

XP-80 WORKSTATION KEYBOARD

RRP £1799 £POA

PROPHECY VIRTUAL MONOSYNTH

The Prophecy is already a legend in its own lifetime, and this incredible new low price makes it better value for money than ever. Virtual synthesis not only gives some great acoustic simulations, but also superb analog sounds, from Moogs through ARP's to some of the classic Rolands. The keyboard that revived the arpeggiator still has one of the best around today, and the ribbon controller and knobs galore make for a highly expressive instrument. Limited stocks only at this price - buy now or forever hold your peace!

RRP £999 £699

CALL SOHO SOUNDHOUSE ON 0171 379 6766 FOR DETAILS

DTR-1 RACK-MOUNT DIGITAL TUNER

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

RRP £249 £169

DTR-2 RACK-MOUNT DIGITAL TUNER

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

RRP £149 £99

JV SERIES EXPANSION BOARDS

Roland's JV modules and XP keyboards are superb units in their own rights, but expandability of the machines is where they really come into their own. There are over 10 different expansion boards which can be fitted (up to 4 at once, or 8 in the JV2080), 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 this unbeatable offer - buy any compatible machine from us and get any four boards for only £499! Check them out today!

RRP £1076 £499

TRINITY KEYBOARD WORKSTATION

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

RRP £2345 £1399

TRINITY PLUS £1799
TRINITY PRO - £1999
TRINITY PROX £2199

PACIFICA 112 ELECTRIC GUITAR

Available in Natural, Satin, Black or Antique stain with maple or burlings fingerboard. All with FREE Pro set-up.

RRP £199 £169

PACIFICA LEFT HOOKER ALSO AVAILABLE only £179

PC-160 MIDI CONTROLLER KEYBOARD

The PC160 has fullsize keys with touch-sensitive in an aggressive 'bender' lower flexing pitch glide, vibrato etc... 12 octave switcher lets you play over a 6 1/2 octave range. There's also a touch for optional sustain pedal (£14.95) and setting of GM/IGS parameters for sound modules (to save big Yamaha DRS50).

RRP £139 £69

CS1x SYNTHESISER

Here's another fantastic addition to this year's line 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 £POA

SANSAMP RANGE

TECH 21 - NYC

The Tech 21 range of hand built American pedals emulates every tube amplifier sound ever desired, giving you the classic Fender, Marshall, Boogie, HiWatt, Vox sounds etc - all in one versatile unit at a fraction of the cost of the original!

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PC-200 MkII MIDI CONTROLLER KEYBOARD

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

RRP £199 £149

Check out our unique package prices with these modules:

DSW + PS55	£49
MOD1 + PC200	£34
MU18 + PC200	£34
SC7 + PS55	£21

MK149 MIDI CONTROLLER KEYBOARD

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

RRP £199 £119

Check out our unique package prices with these modules:

DSW + MK149	£39
MOD1 + MK149	£34
MU18 + MK149	£34
SC7 + MK149	£19

DM01 GUITAR RADIO SYSTEM

OVER HALF PRICE

The DM01 by Soundcraft is a single channel diversity guitar radio system. This end-of-line clearance deal represents the last opportunity to acquire one of these superb systems at a fraction of their original asking price.

Hurry - Limited quantity available, as always first come, first served!

RRP £327 £149

KX88 MASTER KEYBOARD

The KX88 has been the luxury master keyboard of choice in top studios, and with the death of the Synthesizer, has probably the best section available. 63-note wooden weighted keyboard, 88 keys for 2 sustain pedals, 2 continuous controller pedals (one of each is included), breath controller, 2 wheels, 4 sliders, 3 momentary switches, 3 toggle switches and aftertouch. Apart from taking pride of place in your studio, the KX88 can be considered a collector's item, and with no sounds to go out of date, it will last your whole musical career.

RRP £1649 £849

KEYBOARDS NEW, USED & EX DEMO

Alesis OS6	£379	Korg Trinity Hard Disk Option £289	Roland A8EX	£1499	
Alesis OS7	£379	Korg Trinity PLUS	£1999	Roland E16	£341
Alesis OS8	£379	Korg Trinity PRO	£1999	Roland E26	£369
Casio CTK530	£159	Korg Trinity Prophecy Option £299	Roland E96	£1298	
Casio GZ500	£169	Korg Trinity PROX	£1995	Roland PC200GS	£79
Casio GZ500	£179	Korg Trinity Sample Option £429	Roland RD500	£1295	
Hammond GM1000	£249	Korg Trinity Scal Option £249	Roland XP10	£369	
Korg K5	£29	Korg K5	£29	Roland XP50	£99
Korg PROPHECY	£549	Korg K5D	£349	Roland XP80	£1149
Korg Trinity	£999	Roland A33	£346	Roland XP90	£799
Korg Trinity	£999	Roland A20	£1999	YAMAHA PF150	£1195

MULTI-FX PROCESSOR ZOOM 505 & 506 - IN STOCK

The 24 built-in Digital and Analogue Effects, 9 of which can be used simultaneously and stored in any one of 24 fully programmable memory locations, alongside the integral Auto-Chromatic Tuner and Amp Simulation, make the New Zoom 505 Guitar a mouth watering prospect.

Full Zoom range in Stock

1016	GA	6446	CALL
508	1169	6086	CALL

NEW £99

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*We will best price genuine items from a UK or European dealer. We must be able to show you the original, and the price must be 10% and in stock. Prices are £17.5% VAT E & O E UK mainland carriage from £9.99

Rode NT1

Cardioid Capacitor Vocal Mic

PAUL WHITE comes to the end of the Rode, and finds it pretty good to sing into!

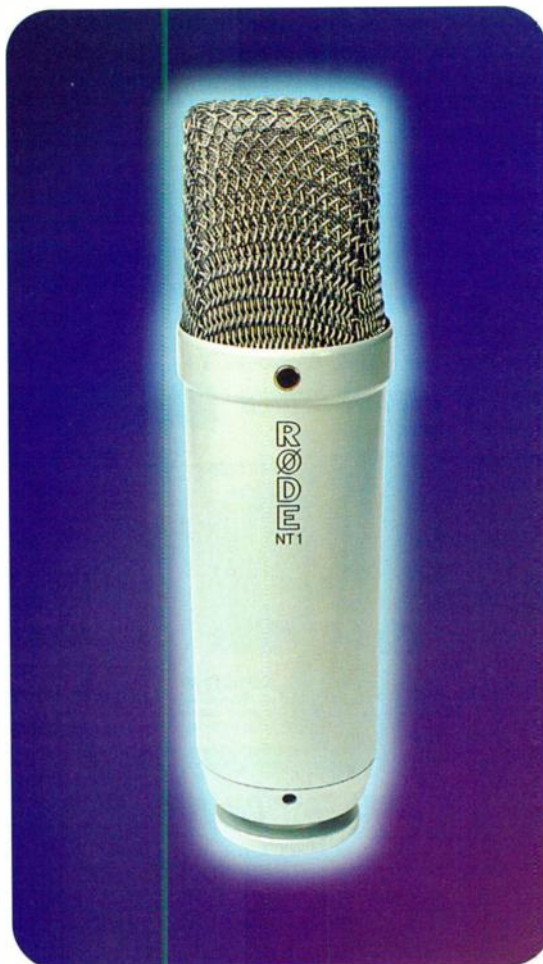
With digital equipment sounding more anonymous all the time, choosing the right mic to give you the sound you're after at source is probably more important now than it ever was. A good studio mic must be quiet; it has to sound good on vocals; and in most cases a flattering quality doesn't go amiss either. If it's the only good mic you can afford, it must also double as an instrument mic, at least for acoustic instruments. It also doesn't hurt to have a good-looking mic that will impress the clients!

Rode's NT2 was a breath of fresh air in a mic market dominated by relatively few big names, and when their tube Classic turned up for review at the *SOS* offices, everyone who tried it proclaimed their undying love for it. Sadly HHB wanted it back anyway — but now they have a new vocal microphone with a price tag that puts it within reach of just about anyone who wants to have at least one good capacitor mic in their studio. Like the NT2, the NT1 bears more than a passing resemblance to Neumann's classic U87 but, rather than adopting the metal finish of the earlier models, this one has a creamy grey enamel coating that gives it a reassuringly vintage look. As far as I can see, no corners have been cut on quality and the standard of engineering is excellent. What's enabled Rode to cut back on the price is that this model has a fixed-pattern cardioid capsule using a single large-diameter diaphragm. This is obviously much cheaper to build than the dual-diaphragm capsules used in Rode's switchable-pattern mics, though it features the same one-inch gold-sputtered diaphragm construction as the other mics in the range. The capsule sits in a specially developed shock-mount system and feeds an integral FET

preamp that has an electronically balanced output stage rather than a balancing transformer. Again, this saves on price, but if done properly it can also sharpen up the transient response. All the electronics are mounted on a monocoque sub-assembly, and the internal standard of design and construction is as high as that on the outside.

A stand clip fastens onto the bottom of the mic via a locking ring, and a simple thumbwheel effectively locks the assembly at any desired angle, unlike some mounts which insist on slipping even if you've just tightened them with mole grips. I'd buy an elasticated shock mount for this mic if it were mine, simply because it deserves one, but the mount that's included is functional enough providing the mic stand is resting on a solid floor.

The wire basket protecting the capsule has a fairly open weave, and a secondary layer of fine mesh is bonded to the inside of the basket via a



pros & cons

RODE NT1 £329

pros

- Detailed sound with a rich, warm character.
- Very nicely made.
- Comes with plastic carry case and stand mount.

cons

- No shock mount, pad switch or LF filter, but at this low price, I can live with that!

summary

This is one of the nicest sub-£1000 mics I've heard to date, and at £329 it must qualify as one of the best bargains around at the moment.

SOUND ON SOUND

high-pressure press, resulting in a very tough but acoustically transparent structure. The open outer basket helps deliver a more natural open sound, but at the expense of sacrificing some pop shielding — as I've said before many times in these pages, vocal mics should always be used with an external pop shield, simply because any mic basket is too close to the capsule to be fully effective on its own. The NT1 comes with its stand mount in a padded, rigid plastic carry case.

RODE TEST

The frequency-response graph of the NT1 is very similar to that of the NT2 and, in common with most large-diaphragm capacitor mics, it adds a little subtle colour to the sound by introducing a hint of frequency-response tailoring. Nominally flat up to around 10kHz, the response shows a gentle presence hump centred at around 15kHz, and the overall useful response extends from 20Hz-20kHz. Such spectral trickery as is built in isn't enough to create an unnatural sound, but helps enhance the detail and sense of air at the top end of the spectrum. Quoted noise is 17dB and the sensitivity is 18mV/Pa, which is slightly higher than the other two models in the range; in a direct subjective comparison with Audio Technica's very excellent ATM4033, the sensitivity appeared roughly similar. In a loud environment, the maximum SPL handling is 135dB, but there's no pad switch, so if you're planning to work at such punishing levels, you'll probably need to bring in the pad switch on your mixer. There's also no LF rolloff switch either but, again, these are commonly found on mixers, and if missing these things out has helped keep the quality up and the price down, that's OK by me.

Some of the lower-cost capacitor cardioid mics, especially those with cast grilles rather than wire baskets, can sound slightly nasal, but this one has a lovely open character, along with a hint

“With digital equipment sounding more anonymous all the time, choosing the right mic to give you the sound you’re after at source is probably more important now than it ever was.”

more warmth than you might expect from a non-tube, transformerless mic. This works particularly well on vocals, accentuating the chest and throat resonances without boominess or boxiness. The tube Classic does have a rather more mellifluous quality, but the NT1 is able to hold its own as a quality vocal mic in any company. Tested using my faithful acoustic guitar, the NT1 managed to inject more depth into the sound than my wimpy light-gauge strings normally allow; in comparison, some of the other low-cost capacitor mics I tried alongside sounded decidedly thin. The mic that sounded most like the NT1 was probably the ATM4033,

though there were slight differences: the NT1 had a marginally thicker sound, and the 4033 seemed a hint more ‘airy’ at the top end.

SUMMARY

Though this is a very straightforward mic with no pattern switching, no pads, and no filters, it has classic looks, a build quality that can’t be faulted, and a warm, flattering sound that doesn’t go so far as to introduce unnatural coloration. Most sales will probably go to project studio owners, though the performance is well up to the level of big-league studio work, so I wouldn’t be surprised to see a number of these mics appearing in mic lockers

alongside the more established names. As an acoustic instrument mic, the NT1 also does extremely well: and, though I wouldn’t let a drummer get within a stick’s length of one, a pair would also make great drum overheads.

Possibly the best news is the price, which allows the NT1 to qualify as a credit-card impulse purchase — and in the presence of a mic like this, who wouldn’t feel impulsive? With few exceptions, if you want a low-cost capacitor mic, you have to settle for imports that may fall well short of the constructional standards enjoyed by the top names, but from what I’ve seen (and heard), of the NT1, the only thing that’s been compromised is the price.

SOS

£ £329 including VAT.
A HHB Communications,
 73-75 Scrubs Lane,
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PreSonus Blue Max

Smart Compressor

PAUL WHITE finds out about compression by numbers.

Compressors are an integral part of studio recording, but some users are still not entirely confident about setting them up, especially when it comes to selecting the best ratio, attack and release times for specific material. PreSonus have their own solution to this problem in the Blue Max compressor: it not only includes all the standard compressor controls, but also a rotary switch that selects from 15 presets designed to suit specific source material. It's an idea that's been bandied about by more than one manufacturer, but this is the first budget product I've seen that has put the plan into practice.

The Blue Max is a half-width processor, and that in itself will alienate some users, but at least it does run from the mains, not one of those infuriating external PSUs. Rear-panel

the leftmost 8-segment meter from input to output. A second 8-segment LED meter monitors gain reduction up to a maximum of 28dB.

THE PRESETS

When a preset is selected, only the Input and Output gain controls are active, and the degree of compression is determined by the Input setting. Everything else is looked after by the preset. There are three vocal presets: Soft, Medium, and Screamer (for loud vocalists who need firm control). For percussion, there's Snare/Kick, designed to emphasise the attack of the sound, and L/R overhead. For fretted instruments, there are settings for Electric Bass, Acoustic Guitar and Electric Guitar, the last two again emphasising the attack of the instrument. The keyboards section includes a setting for keeping pianos even and a fast setting for synth stabs. A third setting, *Orchestral*, is designed to decrease the dynamic range of string and pad parts.

For handling stereo mixes, you have Stereo



switching can be used to optimise the operating level for -10dBV or +10dBu, and there's a side-chain insert for de-essing. Signal connection is via unbalanced jack, which is ideal for most consoles (as insert points tend to be unbalanced on project studio equipment). And why is the unit so small? Because the Blue Max is designed as a stereo compressor, so all the controls affect both channels.

LAYOUT

Ranged across the front panel are six knobs, the first of which is the Presets rotary switch, offering 15 presets plus manual operation. Rather than a conventional Threshold control, the compressor uses a variable Input control, which has enough range to accommodate DI'd guitars and basses, though some may feel that the 100kΩ input impedance is a little on the low side for DI'ing guitars. Ratio goes from 1:1 up to a steep 20:1, and Attack is variable from 0.01-100ms; Release covers 10-500ms, and there's an Output gain control with up to 20dB of gain in hand. One button switches the compressor in or out, while another switches

limiter, which is a simple hard limiter, and Contour, a gentler setting useful for fattening up mixes. The last group of settings is for creating special effects: Squeeze is suggested for electric guitar when you want that 'glassy' sound; Pump does just what it says on the tin — it's great for big drum sounds.

IN USE

Because the Blue Max has no Threshold control, the amount of compression has to be set by increasing the Input gain control until the desired amount of compression is showing on the gain reduction meter. For mono use, only a single channel can be used, as the side-chain always operates in a linked mode; if you want to set your own compression parameters, the Preset switch must be set to the Manual position. In general, everything works as expected, but the lack of a marker line down the side of the Preset switch had me sighting down the knob every time I changed settings. This really is thoughtless design — unless the box is set up at eye level, you're almost bound to select the wrong position.

The quality of compression treads a nice line

pros & cons

PRESONUS BLUE MAX £189

pros

- Easy to use.
- The presets seem well chosen.
- Mains power.

cons

- Dedicated stereo configuration means you can only use one channel of the unit for mono use.
- Preset knob not clearly marked.
- Half-width format isn't popular with everyone.

summary

A well-behaved, nicely designed compressor which provides presets for most popular applications as well as full manual control.

SOUND ON SOUND

between transparency and the use of compression as an effect, but if you want pumping, you can get it, as the Pump preset aptly demonstrates. There's nothing overwhelmingly clever about the compression, but the choice of preset values is, on the whole, good, and should really help out those who don't feel entirely at home juggling their own compressor parameters. You still have to use the Input control to determine the amount of compression, but that much can be done by ear. I was also pleased to see that the Output control doesn't affect the bypass level, so you can get your treated and untreated sounds at the same level for comparison.

SUMMARY

This is a relatively inexpensive compressor, but it performs well, and the presets really do work well for their designated applications. What's more, the manual tells you what the settings are, so you can learn a lot about what's going on. The only poor design point is the lack of a marker line down the side of the Preset switch knob, and of course the inherent limitation of a stereo compressor is that you can't use it as two mono units. Whether or not you like the half-width format is a personal decision, but, with the Blue Max, PreSonus have proved that the concept of preset compression settings is valid, and that it doesn't have to cost a lot. If you're looking for an easy life, this might be your ideal compressor.

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Emu Orbit V2

Sound Module

The Orbit was the first in Emu's growing line of themed sound modules, and since the other units in the range have moved on somewhat in terms of spec, Emu have decided to give the Orbit the benefit of the new goodies. MARTIN RUSS gets a second helping.

When I looked at the original Emu Orbit about a year ago (June 1996), it was the first in what's turned out to be a series of modules providing themed sounds, plus a rather clever Beats mode which turns a sound module into something like a drum machine. As usual, Emu have been busy refining and improving, so the V2 Orbit adds new features, as well as significantly expanding

the whole concept — in fact, the Orbit now matches the functionality of the recently-released Planet Phatt and Carnival modules.

I'll start with the recap: the Emu Orbit is a 32-voice polyphonic, 16-part multitimbral synthesizer with six audio outputs. It's General MIDI-compatible only as far as one of its drum kits, and features 640 patches — 256 in RAM for your own edits, and 384 more permanently stored in ROM. There are more than 600 sound samples: audio sound-bites which attempt to include most of those noises that inhabit dance-orientated music: scratches, hits, chord stabs, drums, more drums, and even more drums. Actually, the selection also includes lots of very nice synthesizer pads, lead-line sounds and some very unusual effects, which opens up the Orbit to programmers — although the use of sampled chords does restrict the usage of some of the samples.

WHAT'S NEW?

There are 128 new presets, which show off some of the programming possibilities opened up by the Orbit's synchronised LFOs. Being able to sync the LFOs to the tempo clock (actually to a range of note values, from double whole notes, via triplets, all the way to 32nd notes) means that you can change the Beats tempo and the relative timing of anything using

pros & cons

EMU ORBIT V2 £999

pros

- Large number of samples, suited to almost any music genre which has a strong dance content.
- Beats mode and Song mode make it almost a drum machine.
- Useful new enhancements.

cons

- Beats and Song Mode stretch the user interface close to its limit.

summary

The enhanced MIDI control now makes this module a powerful addition to a sequencer. The sounds, ease of experimentation, Beats/Song capture and control via MIDI add up to lots of useful capability in a single box.

SOUND ON SOUND

the LFOs follows this tempo. Neat and very effective.

The Beats mode provides 100 (an extra 40) preset sequences which produce drum patterns when played back using the special patches. In fact, there's nothing to stop you using any patch for the Beats pattern — it's just that pitched sounds tend to sound pretty weird.



ON THE UP: V2 ENHANCEMENTS

Here's a quick comparison of the old and the new.

	ORBIT V1	ORBIT V2
PRESETS	512	640
RAM	256	256
ROM	256	384
PRESET NUMBERING	0-511	5 banks of 128
BEATS	60	100
SONGS (USER)	0	28
SONGS (FACTORY)	0	28
MIDI NOTE START	Yes	Yes, now assignable to any note number
MIDI NOTE STOP	Yes	Yes, now assignable to any note number
MIDI NOTE MUTE	No	Yes, now assignable to any note number
X-FACTOR CONTROL VIA MIDI	No	Yes
TEMPO CONTROL VIA MIDI	No	Yes
BEATS TRANSMIT MIDI OUT	No	Yes
EXIT BEATS MODE AND IT KEEPS PLAYING	No	Yes

Providing control over the transposition (Emu call it the X-Factor) of the Beats mode sequencer means that instrumentation changes, which can be very effective. In the original Orbit, this innovation was effectively ruined because the patterns did not appear at the MIDI Out socket, so you couldn't record a Beat that you liked and tweak it by adding or removing beats or changing the instrumentation. Orbit V2 now provides Beat patterns via MIDI. It also allows control over transposition via MIDI SysEx messages, and, in fact, lets you send a single SysEx message which can set the beat number, tempo, transpose and patch number. It is also possible to exit Beats mode and leave the pattern playing, so that you can (for example) select a

SPECIFICATIONS

- Up to 32-note polyphonic.
- 16-part multitimbral.
- 640 preset sounds.
- 256 user RAM memories.
- 384 permanent ROM memories.
- 8Mb sample memory.
- 384 'samples' (many multisampled).
- 18-bit DACs.
- 16-bit linear audio encoding.
- Three sets of two stereo outputs, incorporating four submix inputs.

UPGRADE

With all these goodies, there's an obvious question: is it possible to upgrade from a V1 to a V2 Orbit? The answer is yes, of course. Option kit model number 9095 (£83) consists of two (easy-to-install) EPROMs, a manual and a V2 sticker for the front panel.

new patch for accompanying the beats. 'Comprehensive' is the word that I'm groping for here.

Whilst Beats mode went some of the way towards providing drum machine functionality in the original Orbit, V2 provides a Song mode, which enables the phrase-based build-up of complete songs by allowing chains of repeated Beats (or Songs) to be assembled. With 100 Beats and 28 Songs you might get a clue about how you can use MIDI Song Select messages to control Beats or Songs: 0-99 select Beats, while 100-127 select Songs. Song mode stretches the user interface of the Orbit (especially the backlit 2-line x 16-character LCD) to its limits, and I found that I needed to keep notes on a piece of paper about

“The V2 Orbit adds new features

— in fact, it now matches the functionality of the recently-released Planet Phatt and Carnival modules.”

how songs were constructed, otherwise editing was difficult to get my head around. But once programmed up, the actual recall and playback is very easy, and that can be controlled via MIDI as well — you can start, stop and mute playback using three assignable keys on your master keyboard.

There's one small problem, though. The manual is beginning to show its ancestry. The same text has been cut and pasted into Emu manuals for some time now, and although the reference section is excellent, the rest of it needs a re-organisation and a re-think.

Since I contacted the factory in the States for advice whilst putting this brief review together, it's worth mentioning that Sean Wilhelmsen of Emu was very helpful to me, which is exactly how I've always found Emu people, and which explains why I use three of their products almost every day.

POLISHED

This was my second time with an Orbit, and it gets harder each time to send it back. Emu's changes have taken the potential of the original Orbit and polished it considerably. Developing beats and then capturing them in a MIDI sequencer and reworking them is fun and quick, and there are all those patches to play as well. This is one of those instruments where trying it out in a shop is very dangerous for your wallet.



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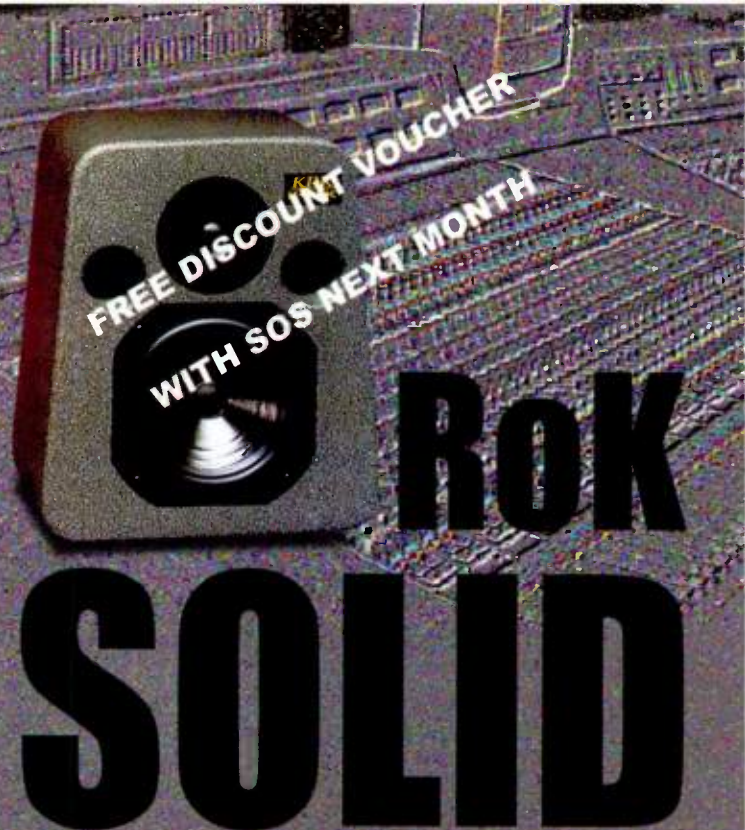
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Joe Meek VC4

Enhancer

PAUL WHITE checks out Joe Meek's first stand-alone enhancer.

It's human nature to want to make everything look or sound better than it really is, which is why special effects and enhancers are the audio industry's equivalent of cosmetics. (They're also, to the best of my knowledge, not tested on animals, though I have my cats lined up for a listening test later in the day...) Ted Fletcher's Joe Meek range has included enhancement sections in some models before now, but this is the first stand-alone enhancer from the company, and at first glance it looks deceptively simple — just five control knobs per channel. The VC4 is a 2-channel device with completely independent control over both channels, so it's equally at home processing two different mono signals or a stereo mix. Its self-confessed purpose in life is

Two paralleled output sockets are fitted to each channel, providing a convenient way of splitting the signal. Mains power comes in via an EC connector, and there's provision to change the mains voltage from 230V to 115V should the need arise.

CONTROLS

In order to enable it to work with pretty much any signal, the VC4 is fitted with an Input Gain control that matches signals levels of between -20dBu and +10dBu, and this is accompanied by a five-LED level meter with a red clip LED in the highest position. The first green LED remains on to show that the unit is powered up, and the aim is to set as high a signal level as possible with the clip LED coming on only very occasionally, if at all. A further gain control is used at the output so that the enhanced signal can be brought up to any required level.

Three controls relate to the enhancement effects, the first being the Drive control, which regulates the level of the high-frequency side-chain signal fed to the internal compressor. As far as I can see, the frequency of the side-chain signal is set, but the Q control may be used to vary the bandwidth of the affected

pros & cons

JOE MEEK VC4 £399

pros

- Easy to use.
- Effective on a wide range of source material.
- May be used as a dual-channel unit, or to process stereo mixes.

cons

- Addresses only high-frequency enhancement with no facility for adjusting the bass end.

summary

A simple and reasonably versatile enhancer which can be used to add definition and clarity to most types of source material.

SOUND ON SOUND

OPERATION

Fed from a stereo mix, the unit is quick and easy to set up, though there's quite a lot of leeway in how you set the Drive control, so you may need to experiment to get the best results. A medium Q setting is a good starting point, after which you simply advance the



to add that elusive sonic 'glitter' to music, and it does this by extracting a portion of the high-frequency end of the spectrum, compressing it, and then adding it to the original signal. In this respect, the circuit is more akin to a dynamic equaliser than to a traditional harmonic exciter, though I wouldn't be surprised if some harmonic generation was also taking place. No bass-end processing takes place, but the circuit goes down to 20Hz so as not to introduce any unwanted phase shifts into the signal.

Housed in the familiar green rack box, the VC4 connects to the rest of the audio world via balanced jacks, though these may be used unbalanced without any loss of signal level.

region from very narrow — in its anti-clockwise position — to quite broad, in its clockwise position. The Enhance control then sets the level of compressed high end added back into the main signal, and a bi-colour LED below the Drive control helps the user set the optimum drive level. When sufficient signal is available, the LED flashes green and turns orange on the signal peaks, though at narrower Q settings I found it impossible to get to the orange stage. This is understandable, as the narrower the filter, the less signal passes through it, and it didn't seem to compromise the process in any way. Each channel has its own Bypass button, though these are positioned between the knobs and are not as easy to operate as they could be.

Enhance knob until the right amount of brightness has been added. The aim is to emphasise high frequencies in such a way that the mix sounds clearer and brighter. Interestingly, the subjective nature of the VC4's enhancement isn't radically different to what you'd expect from a basic Aphex model, though the ability to vary the Q makes the process quite flexible if you want to pick out drum or cymbal sounds. On the down side, higher Q settings used over a complete mix will help lift out the hi-hats, but vocals can tend to become sibilant, so you have to be sparing in your application.

On individual instruments, you can afford to be a little more heavy-handed, and you'll

find that drum sounds, both real and electronic, will take on a new edge with much improved definition. Acoustic guitar tracks can be given that 'new strings' gloss: wider Q settings help breath new life into vocals by giving them more air and space. However, if you listen to the enhanced portion of the signal turned full up, some sounds, such as acoustic guitar, can get quite nasty on the widest Q setting, so I'd recommend that you check the sound this way before backing off the enhance level to a more realistic value. As with other exciters and enhancers, instruments tend to sound better separated in the mix, but over-use can cause harshness, so it's wise to use the Bypass buttons on a regular basis to see exactly how much processing you've added.

SUMMARY

I have to confess to a liking for Joe Meek products, and this one is both effective and simple to operate, though I don't think the results that can be achieved are radically different from what you might expect from, say, a basic Aphex or BBE enhancer. Turn any enhancer up full and it'll probably sound quite different to the competition — but use it properly and the amount of enhancement involved will be fairly small, which is why the various types tend to sound more similar than you might imagine. The VC4's adjustable Q control provides a little extra

“Used with care, the VC4 can make a dramatic improvement to sounds or mixes that are lacking definition.”

flexibility in one area, but not having control over the filter's frequency detracts in another, so the overall flexibility is probably about the same as you'd get from an Aphex Type B or C.

Used with care, the VC4 can make a dramatic improvement to sounds or mixes that are lacking definition, and medium Q settings are relatively gentle on delicate sounds such as voices or acoustic instruments. The enhancer market is a tough one to break into, with the likes of Behringer dominating the low-cost end and SPL's Vitalizer still taking all the prizes at the higher end, but Joe Meek products have a good reputation and a high profile, which puts the company in as good a position as anyone to stake a claim in the middle ground. Like cosmetics, all enhancers have to be used carefully if the the results are to be artistically pleasing, but I've heard enough to recommend that you listen to the green alternative before deciding which one is right for you.

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TL Audio Crimson

Parametric Equaliser

PAUL WHITE raises the tone of his studio by plugging in TL Audio's latest Crimson series parametric EQ.

TL Audio's Crimson range of products has now grown to include seven different units, all using the same basic circuitry as the Indigo tube series, but with solid-state gain stages replacing the valves. While the valves add a certain character to the sound, the fundamental designs stand up perfectly well in their all solid-state form, and save the end user a significant amount of money into the bargain. The 3013 reviewed here is a dual-channel parametric equaliser in a 2U package but, unlike the 3012 (which we looked at in February 1997's *SOS*), it has four bands of fully parametric equalisation on each channel, plus a pair of very useful high- and low-pass variable-frequency shelving filters. To extend the flexibility of the unit further, a pair of balanced mic preamps is included, complete with switchable phantom power, and there's also an insert point between the mic amp and the equaliser for connecting additional signal processing.

Like the other Crimson models, the 3013 is powered via the mains, not an adaptor, and both balanced XLR and unbalanced jack audio connectors are provided on the rear panel. There's also an unbalanced auxiliary jack input for each channel, conveniently located on the front panel, and this may be switched to accept line or high-Z instrument- or mic-level signals. The impedance is high enough to use directly with passive electric guitars or basses.

Stereo linking is available via a push-button switch to the right of the front panel, allowing both channels to be controlled simultaneously from the lower channel controls.

FEATURES

A continuously variable front-panel gain control (affecting all inputs) provides between 10 and 60dB of gain for the mic input, though there's no mic level metering other than the clip LED on the unit's Master output section. Mic or line operation is selected via a button adjacent to the jack input, and each channel has a 48V phantom power button with a red warning LED.

There are continually variable LF and HF frequencies for the 12dB/octave shelving filters covering the ranges 30Hz-1kHz and 1-25kHz, and each of these has its own bypass button with an amber status LED. Such controls are immensely useful for trimming away unwanted high or low frequencies without affecting the frequency range you do want too significantly, and are a welcome inclusion in any serious equaliser.

The parametric EQ comprises four sections which are identical in all respects except the frequency ranges they cover. Bands 1 and 2 have a range from 30Hz-3kHz; bands 3 and 4

pros & cons

TL AUDIO CRIMSON 3013 £1169

pros

- Good build quality and cosmetic design.
- High-quality EQ with additional shelving filters.

cons

- Mic metering would be nice.

summary

Like the other Crimson units, the 3013 delivers an excellent combination of value, performance and flexibility at a significantly lower cost than the tube version.

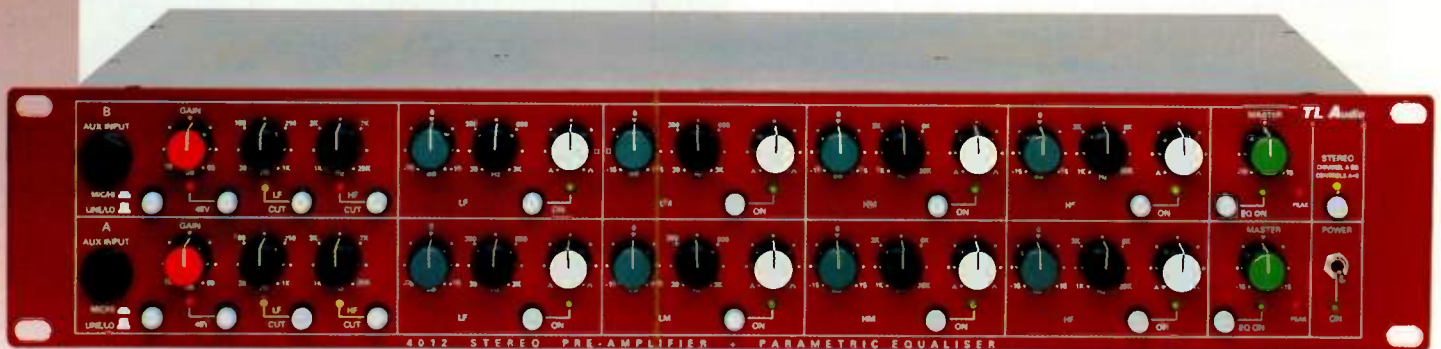
SOUND ON SOUND

are fully variable from 1-20kHz. All have a ± 15 dB gain range, and the filter's Q can be varied from 0-.5, which is more than adequate for most practical purposes. Each section has its own bypass button with a green LED to show when it's on, and the gain controls are centre-detented. The master section includes an overall channel EQ bypass button, again with status LED, and a Master level control. A red peak LED warns of clipping at the equaliser output, before the master gain control.

PERFORMANCE

Over the past few months, I've tried out quite a few TL Audio products, from both the

"This equaliser lets you add air and detail to the top end and as much depth and punch as you need to the low end, but it manages this without 'smearing' the sound in the way that lesser equalisers so often do."



son 3013

Indigo and the Crimson ranges, so I wasn't the least bit surprised when this particular model turned out to be a strong performer. You get the same high-quality mic amps as are found in the other units, and though these don't have the same qualities as some top-end esoteric mic preamps, they are noticeably better than most of those that come built into mid-priced mixing consoles. I particularly appreciated the shelving filters, which are wonderful for taming flabby bass, or for taking the rough edge off guitar tracks, but of course the main thrust of this particular unit is the 4-band parametric equaliser.

Equalisers vary enormously in quality, and I rarely find desk EQ satisfactory except on really top-end consoles. Used on a stereo mix, this equaliser lets you add air and detail to the top end and as much depth and punch as you need to the low end, but it manages this without 'smearing' the sound in the way that lesser equalisers so often do. It isn't as transparent as the high-end Focusrite gear, but

on the other hand some users will probably say it has more character. If you have a peak to deal with, set up a high Q and apply cut — the 3013 has the capability to deal with such problems quite easily. Using a broad Q setting results in a musical, well-behaved equalisation that can help shape voices or polish mixes without changing the fundamental timbre of the sound being processed.

While two bands of parametric EQ are usually fine for overall timbral shaping, it's useful to have the two extra bands for notching out peaks or for focusing on something like a hi-hat to help lift it out of the mix. Admittedly, the tube magic isn't there, but then again, in some ways I think of tube coloration as an effect, so it makes more sense to keep it separate and in a more controllable form.

SUMMARY

Not only is the 3013 an extremely flexible and well-designed parametric equaliser, but the provision of such a versatile front end means

that it can also be used as a direct-to-tape mic channel or as the ultimate guitar/bass DI box. Mechanically and cosmetically the unit inspires confidence, and the controls are set out clearly and logically, making it easy to navigate. All the relevant buttons have bright status LEDs and unbalanced jack connections are present for the majority of people with unbalanced desk insert points — yet fully professional, transformerless balanced connections are also included, along with insert points. These insert points are far from a luxury, as patching in a compressor between the EQ and mic pre turns this box into a powerful voice channel. And, of course, there are two channels, so you get two of everything, including stereo linking. Given the price, this is a powerful and very versatile box that does far more than just provide EQ. **505**

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Spendor QT100

Nearfield Monitors

The minute he walked in the joint, HUGH ROBJOHNS could see they were real small Spendors. He decides whether he'd like to spend a little time with them...

Spendor are one of the oldest and best-known manufacturers of professional monitor loudspeakers in the UK. The company was named after its founders, Spencer and Dorothy Hughes, and was set up in 1969 to bring Spencer's experience of helping to design the BBC's own in-house monitoring loudspeakers to a wider audience.

The key words that define any monitoring speaker are neutrality, consistency and accuracy, and Spendor's speakers have always embodied these qualities fully. The newest member of the family is the diminutive QT100, a powered two-way monitor intended for nearfield applications such as project studios and video or audio editing suites.

THE GUBBINS

The QT100 is very compact, measuring 305 x 192 x 212mm and weighing 7.5kg. Overall, it's a little smaller than the company's SA200

powered system, but retains the chamfered top and side edges of the latter design to minimise diffraction. Like its elder sibling, the QT100 is a two-way reflex design, the ports ending in a pair of small triangular openings at the bottom corners of the front edge. The port openings are filled with a very open-celled plastic foam, presumably to prevent 'chuffing' from the ports.

The cabinet is constructed from high-grade MDF which is well braced, and damped internally with copious amounts of foam rubber to minimise vibrations and resonances. The amplifier/crossover pack is very similar in appearance to that of the SA200 and is mounted within a recess on the rear panel. But, unlike the SA200, the QT100 has a single 60W amplifier chip and employs a passive crossover to split the frequency bands to the two drivers. The speakers have been designed for freefield use and, in any case, a sensible gap must be left behind the units to allow air to cool the large heatsink on the rear panel.

Spendor have designed their own bass unit for this model. Called the 2000 series, it is a 6Ω unit with a peculiar 100mm elliptical polymer cone incorporating a solid centre-dome plug. The unit has a very large motor assembly and should be able to withstand a moderate amount of abuse without too much trouble. It is also fully magnetically shielded and can be placed right next to a TV or computer monitor without problems.

The tweeter is a stock unit, a Morel MD112



pros & cons

SPENDOR QT100 £704

pros

- Very compact package delivering a professional sound quality.
- Ideally suited to use in project studios as well as many other (equally critical) applications.

cons

- Limited bass extension means that you may not be aware of all that rumbles in the deep.
- Perhaps a tad on the bright side of accurate.

summary

Well-designed mini-monitor for the cost-conscious quality freak. Excellent imaging and transient response, with well-balanced and well-extended frequency ranges (for the size) and a credibly accurate and neutral sound. Hard to break, easy to install and portable to boot.

SOUND ON SOUND

28mm soft-dome tweeter with a neodymium magnet. It has been mounted in a bespoke plastic collar which provides the front mounting plate; two LEDs show when the unit is powered and when the protection circuitry has been activated. The only potential problem is the absence of any protection for the exposed tweeter dome, which is proud of its surround. These monitors would make a great portable reference system if you could be sure the tweeters would still be dome-shaped after they had bounced about in the back of the car.

PLUGGING IN

Connecting the QT100 up is child's play. The rear panel has an IEC mains connector, a power switch, a 3-pole XLR socket and a gain trimmer. The mains socket has an integral fuse holder which also doubles as the voltage selector, and the amplifier will happily accept balanced or unbalanced connections, provided the XLR plug is suitably wired.

Once the unit is plugged in and powered, a small green LED just above the tweeter illuminates and the unit is ready to go. The gain trimmer on the rear panel alters the input sensitivity of the amplifier between -6dBu and +14dBu — a range of 20dB. As set up at the factory, from an input of -6dBu the unit can generate 100dB SPL at one metre and tolerate brief peaks of 103dB SPL. I found the QT100s excessively sensitive with the line-level monitoring feeds from my mixer, so I tweaked the sensitivity down, but a stereo pair of these speakers can produce an impressive wall of sound should the need arise. The specifications

claim a frequency response of 70Hz-20kHz, ± 3 dB, and each pair is matched to within 0.75dB across the full range. The crossover is set to a remarkably high 5kHz, so the bulk of the effort is very definitely coming from the bass unit. Most two-way designs are forced to cross over at about 3kHz, which is slap-bang in the middle of the most critical region for our hearing. The Spondor avoids this troublesome area completely, which is probably a major aid in getting the neutrality and sound quality it has. The amplifier and drivers are equipped with a pretty comprehensive protection circuit. This provides a switch-on delay of five seconds and a switch-off muting of 100ms, to prevent damage to the drivers from the potentially very large switch-on and switch-off transients when an entire room of equipment is powered up at once (as is the norm in professional video-editing suites, for example). During use, the circuitry also monitors the drive levels to each of the loudspeakers, and mutes the input if it senses impending overload. When the protection circuitry is activated, the red LED mounted above the tweeter lights up.

LISTENING

The QT100s really are cute. I worked my way through my usual test material from CD as well as live guitar, piano and vocals, and was

left feeling mightily impressed. After years of listening to soft, floppy BBC monitors, I found the QTs a tad bright for my tastes — but it really was only a tad, and careful positioning did a lot to correct the situation. Ideally, there would be a tweaker to trim the HF sensitivity (as there is on, for example, the SA200) but, since this model uses a passive crossover, that is unfortunately not possible.

The QT100s provide very finely etched stereo images which remain stable over a sensible listening area. Transients are projected well and with plenty of attack. Decent piano recordings sounded nicely balanced, and natural perspectives came over as exactly that. On voice and vocals they are remarkably accurate, although with perhaps a slight tendency to over-emphasise sibilance. The bottom end has a damn good go at letting you know what is going on in the lower octaves too and the overall balance is very credible.

If you like a lot of level, these monitors won't disappoint. I was astounded at how loud a minuscule 60W amplifier could make these things go! And without getting the heatsink into meltdown or sounding excessively strained into the bargain.

Putting the QT100s in a head-to-head with the little Genelec 1029s (and matching sub-woofer), I felt that the 1029s had the edge, but this was mainly due to the added presence and

weight of their lower octaves. In terms of accuracy, transients and neutrality, the Spondors were very comparable indeed. Perhaps Spondor should consider adding a matching sub-woofer system, which could turn a good mini-monitor into a very powerful one.

Overall, these little monitors share all the attributes of which Spondor are so rightly proud. Although a small monitor has its inevitable limitations, the QT100s — like the other smaller members of the Spondor active monitor family — do a very fine job of presenting a full and well-balanced sound stage. Accuracy, neutrality and fine imaging are the main strengths here. There are more accurate and more neutral speakers around, of course, but most of them are bigger and more expensive than the QT. So this is another speaker to add to the audition list, I'm afraid — decisions, decisions...

SOS

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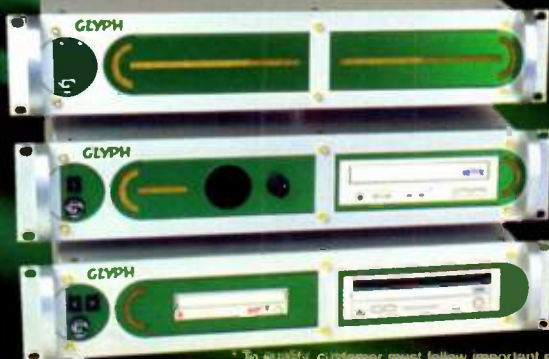
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* To qualify, customer must follow important procedural steps to determine "dead drive" status

Korg Z1

Polyphonic Physical Modelling Synthesizer

Korg's mission to bring musicians the benefits of physical modelling synthesis at an affordable price continues; you can now have a polyphonic, multitimbral Prophecy for well under twice the price of the original. The synth is called the Z1, and GORDON REID is the man with the exclusive technical preview...

When Korg demonstrated the Z1 prototype at its launch in the Lloyds Building last month, presenter Paul Wiffen claimed that the new synth was born in the company's 'More' department... the one that satisfies the dealers' and customers' incessant demands for more of this, more of that and, most probably, more of the other too. This must be one of Korg's busiest divisions, because over the past nine years it has added more voices, more effects and more sequencing capabilities to every PCM-based workstation since the M1. Similarly, it has expanded the Wavestation from its earliest incarnations through the EX, the AD, and finally the SR. Now the department has evidently got its hands on Korg's first physical modelling synthesizer, the Prophecy, and this has suffered more than most... The result is more voices, more physical models, and more performance options.

BASICS

The Z1 is, in its basic configuration, five octaves wide and 12-voice polyphonic, with each voice derived from a pair of physically modelled oscillators plus a sub-oscillator and a noise source. Voices can

be spread multitimbrally across six MIDI channels, making the Z1 the world's first multitimbral physical modelling synthesizer. Furthermore, you can derive each part from a different model and map it to a different zone on the keyboard.

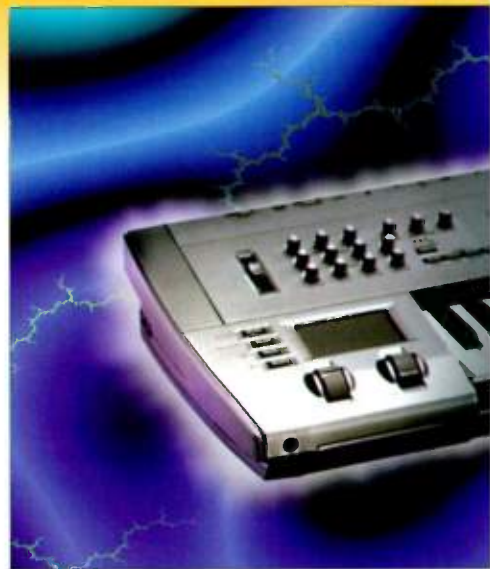
Fortunately, Korg haven't limited their new baby to (and I quote) the "slavish imitation of analogue": the Z1 offers more than double the number of models found in the Prophecy. There are now 13 of these, each derived from the much-touted but as yet unheard OASYS (Open Architecture SYNthesis System). Korg have never made this \$10,000 mega-synth available to the public, and it now looks more like a development platform for the company's affordable instruments than a product in its own right.

The Z1 offers 256 program memories, and these should be enough for most requirements. The 32 multitimbral memories are, however, firmly on the mean side, and I expect frustration to set in quickly. Fortunately, you can save Programs, Multis, Global settings and Arpeggiator patterns to PCMCIA cards. These, while expensive in the summer of '97, should become more affordable as the technology becomes more widely used. A 256K card will hold two complete dumps from the instrument, so a 2Mb card will hold 16 — more than enough for any requirement.

The Z1's keyboard is sensitive to both velocity and aftertouch, and this is complemented by 12 dedicated controls (four filter knobs and eight envelope knobs),



Paul Wiffen demonstrating the Z1 at its launch last month.



pitch-bend and modulation wheels, and four foot-pedal inputs. Unfortunately, a dedicated input for a breath controller is missing. This is a shame, especially when you consider how many wind instruments the Z1 seeks to emulate. By way of redress, the Z1 is the first keyboard to offer a touch-sensitive X-Y pad, as found on latter-day PowerBooks and some laptop PCs. You can assign a wide range of parameters to this pad and, since it's bi-directional, control two of them at a time. Once you've decided the amount by which you wish to alter them, you simply touch the pad at the appropriate point, and then latch the result with a dedicated button. You create dynamic effects by moving your finger over the pad as you play. Even a few moments' experimentation proves that this system has impressive potential, making the Z1 much more expressive than it would be with just the conventional wheels and pedals.

MODELS & EFFECTS

The Z1 retains all the Prophecy's physical models, including, of course, its analogue model. Based upon two DSP-generated oscillators, two resonant filters, and two envelope generators per voice, the model echoes many classic monosynths of the 1970s. But, whereas the Prophecy was monophonic and was, therefore, comparable to a Minimoog or Korg 700S, the Z1's polyphony makes it more like a Prophet 10 or Oberheim Matrix 12. The Z1 even offers a Unison mode that allows you to assign two, three or six detuned voices to each note. Since the Z1 remains multitimbral in this mode, even the most revered analogue synths of yesteryear may soon find their over-inflated reputations and excessive values threatened.

The analogue model also produces a limited range of percussion sounds. Moreover, you can edit these, so you're not restricted to the same old TR808 and TR909 noises — although if you are into these sounds, the Z1 will provide them for you.

The Z1 retains the Prophecy's string, reed

and brass models, but Korg have modified them to take advantage of the X-Y pad. The launch demonstration showed how you can manipulate a single sound — a bass guitar — using the touch-pad to vary the timbre from muted strings to plucked harmonics. The pad appears equally adept at allowing you to control the expression on, for example, violins, trumpets and saxophone sounds, and it will be interesting to test these more critically in the full SOS review later this year.

Of course, the Z1's polyphony considerably extends the use of the Prophecy's models, allowing you (for example) to program a cracking harpsichord using the plucked string model. But what of the new, specifically polyphonic models? The first of these is the electric piano, and this offers imitations of the Wurlitzer EP200 and Fender Rhodes Stage 73, among others. Unlike sample-based synths (which are limited by the nature and timbre of their source PCMs), the Z1 allows you to adjust parameters that relate to the physical nature of the original instruments. One example of this is the position of the 'pick-up' with respect to the 'tine'. Changing this relationship creates a wide range of timbres and responses that conventional filters and ADSR-type envelopes cannot imitate. This is because the complex harmonic structures and time-domain responses of the sounds are significantly influenced by such factors. The Z1's electric piano model emulates these changes, making possible a far wider and more representative range of piano sounds.

Similarly, the Z1 incorporates an organ model that steps beyond conventional Sample + Synthesis methods. This allows you progressively to introduce or remove virtual tonewheel generators, just like pulling and pushing the drawbars of a genuine Hammond. There are limitations, but my first impression was one of 'grit' and considerable authenticity. This may, of course, be a consequence of Korg's Leslie effect algorithms (as found in the G4 and Trinity), so we'll have to investigate further.

The Z1 offers a Frequency Modulation model, although whether Korg will call this 'FM' in final production Z1s remains to be seen. (Korg named their last FM implementation 'VPM' — Variable Phase Modulation — for legal reasons.) Anyway, the FM model generates many of the bell-like, percussive and piano-type sounds that made the Yamaha DX7 such a world-wide success. I find the use of DSPs to recreate earlier digital synthesizers peculiarly amusing, but it proves that the idea of a 'classic' synth is a flexible one, not limited to analogue instruments such as Moogs, ARPs and the Jupiter 8. Whether the concept is arcane or not, I'm looking forward to using this model more



extensively. The DX7 suffered from appalling hiss, and the idea of noise-free versions of its best sounds appeals greatly to me.

Finally, there's a bowed string model that complements its plucked counterpart. You can use this for orchestral strings or together with the analogue model for some luscious pads.

Once you have selected and programmed your models, you can pass the result through the Z1's effects processors. These, like those on the Trinity (and unlike those on almost any other manufacturer's synths), are multitimbral. This arrangement allows you, for example, to flange your guitar sounds while chorusing your pianos and independently EQ-ing your bass, brass, and strings. The effects section is the Trinity's crowning glory, but far too few players appreciate its unique power and potential.

There are 15 'insert' effects, plus a master effects section that offers three further effects and a 2-band EQ. Not as all-encompassing as the Trinity's squillion effects options, this nevertheless remains streets ahead of the competition, and is another good reason to treat the Z1 as a very serious synthesizer.

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Korg Z1

▶ AND THERE'S PLENTY MORE...

The arpeggiator is a key element in the Z1's armoury, and it's another one that takes advantage of the instrument's polyphony. Arpeggiation can be monophonic or polyphonic, and you can choose its form from five pre-programmed

Programs, Multis, Global setups and Arpeggios, and it is also a powerful librarian for all things Z1-ish. Editing is in real time, permitting you to twiddle virtual knobs while playing. Even the beta version I saw appears watertight, and the synth's output remains free from the zipper noise that plagued early digital editing systems. I found the editor

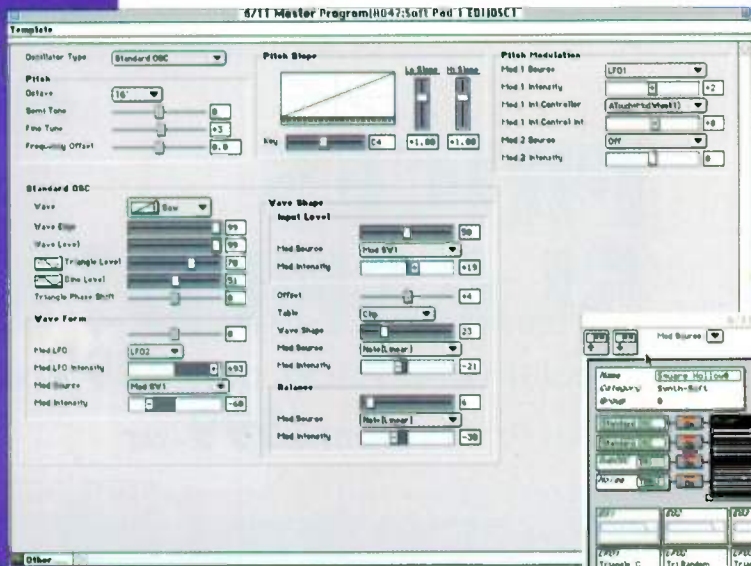
invaluable for programming arpeggios, primarily because the Z1 offers too many facilities for anything less than a full-screen editing display. If Korg don't bundle

interfaces. On the other hand, the ADAT's optical interface is becoming something of a standard for low-cost multi-channel digital I/O. It's economical to implement, it's reliable, and it can travel relatively long distances (especially when compared with S/PDIF). Since eight A/D converters or four AES/EBU outputs could push the Z1 over the £2000 barrier, I suspect that I should forgive Korg for choosing this configuration. Nevertheless, I still view the choice of ADAT I/O as a coup for Alesis' marketing department rather than as an ideal solution for multitrack recording.

Despite these problems (and a few others that will become apparent when we review the instrument in depth), and even without the control panels of the

Roland JP8000 and Clavia Nord Lead, the Z1 may be irresistible. It costs just £200 more than its nearest rival, but offers superior 12-note polyphony

The editor's Z1 voice architecture editing screens.



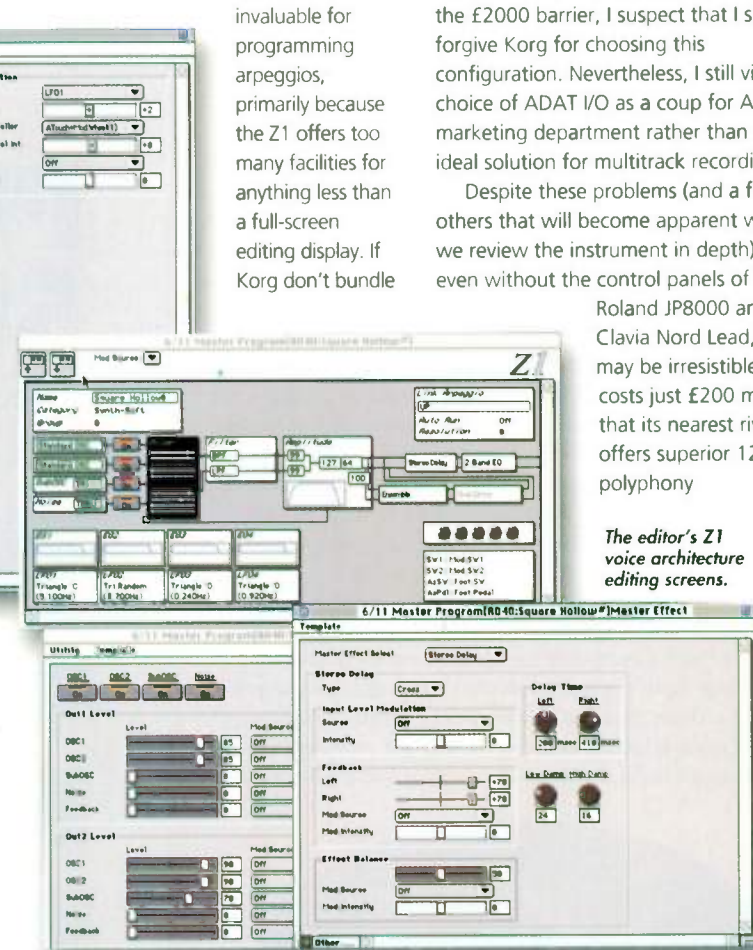
The Z1's Oscillator parameters, as viewed in the Z1 Mac Editor.

or 15 user-definable modes that offer up to 36 steps each. The arpeggiator will act as a MIDI clock master, and you can therefore use it to drive MIDI sequencers and other clock-sensitive devices. Most welcome, the Z1 transmits sequences over MIDI, making it possible to play arpeggios on synths that otherwise lack that capability. On the Z1 itself, you can limit arpeggios to individual parts and keyboard zones, allowing you to play other patches conventionally elsewhere on the keyboard.

Flam is another cool feature, and one that I've never before seen on a synth. Owners of Oberheim's Strummer or the Charlie Lab Digitar will be aware of the impressive results that you can obtain by strumming guitar patches or even non-guitar sounds. Korg's implementation allows up and down motions on each arpeggiator beat, with the flam delay specified for each strum.

The Z1's four LFOs offer even more interesting possibilities, because you can lock each of these to MIDI clock, allowing a sound to have four in-time modulations with durations ranging from breves to demi-semi-quaver triplets.

There is a Z1 editor that runs on PowerMacs and the later 680x0 Macintosh computers. This allows you to edit



this software with the Z1, I'll give you their Managing Director's home address so that you can complain in person.

CONCLUSION

Are there any limitations to the Z1? Yes, of course there are. It falls far short of the original OASYS, it's not really designed for use as a primary instrument, and it lacks many sounds that you would expect from a top-quality workstation. In particular, you mustn't expect acoustic piano emulations, because there aren't any.

Furthermore, the Z1 suffers from one of my pet hates: it's a multitimbral synth with just a single pair of outputs. I'll never understand why manufacturers think that two holes are enough, even if, like the Z1, the synth offers additional I/O in the form of an ADAT interface with a WordSync input. This, if you own an ADAT, is ideal, but I would prefer AES/EBU or S/PDIF

(an optional DSP expansion board will increase this to 18 voices) and 12 more physical models. Indeed, having played the pre-production Z1 three times, I suspect that it's a significant step forward for polyphonic synthesis.

If you fancy an early view of the Z1 you may like to attend one of the dates on Korg's 'Digital Domain' tour. See page 18 in this month's news pages for details.

- £** Korg Z1 (projected price) £1699 including VAT.
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WRB



Large kitchen table covered in various food, bottles, jars, glasses, kitchennails. A chubby flour-dusted hand comes in and opens the book in distance.



Camera moves towards book between jars and glasses



There is a drawing of a country scene. Suddenly Clarissa and Jennifer whiz down the lane and out of the page



There is a drawing of a country scene. Suddenly Clarissa and Jennifer whiz down the lane and out of the page

Tunes for Toons

WRITING MUSIC FOR ANIMATION

Cartoons — they're brilliant! And wouldn't you just love to write the music? **BIG GEORGE WEBLEY** puts you in the picture...

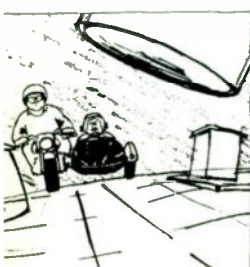
One of the most rewarding jobs a composer can ever do is write music for animation. It's not an easy skill to acquire and there is no higher education course on earth that can show you how it's done. When you compose your first animated score, it really is a case of jumping in at the deep end, getting soaking wet and praying that you don't drown.

GOOD ADVICE

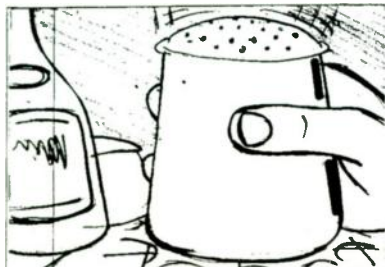
If the opportunity ever does arise for you to write music for an animated TV title sequence or an advert, *do what you know!* If all your previous work has been on a MIDI sequencer triggering sound modules and a sampler, neatly housed in a rack unit, the last thing you should think about doing is printing off a copy of the manuscript from the score edit page of your sequencer and taking that into a studio to get an orchestra to play it. Trust me, no matter how big the budget for the job, it will be a disaster. When it doesn't sound right, you can't just thicken up the cello sequence an octave above and below to see if that works — unless you can instantly hire a couple of extra cellists — and when the lead violinist asks "Do you want it played more 'Animando'?" what are you going to say? "Er... I dunno, but can you play the pitch-bend bit at maximum velocity with a quantise swing of 33 per cent?"

You're going to have enough problems working under the constraints imposed on you by the film makers, the production company and the time available to have to learn the hard way that getting your first big-time job won't give you instant studio experience. So do what you're good at, and if you need help, get it! This business is all about being able to work with and for people, so having someone work for you — to help score parts for an

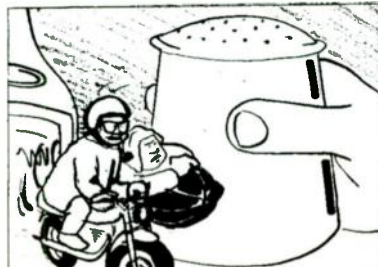
Clockwise from *Noggin the Dog* (who is the company mascot and brains behind the operation): Mandy White, Tim Searle (the boss) and Chris Scott. Set up seven years ago, Triffic specialise in quirky animation of the highest quality and have a list of credits that would fill an entire issue of *Sound On Sound*, including *Have I Got News For You*, *Two Fat Ladies*, *Class*, *Coogan's Run*, *Samson Superslug*, and *Absolutely*.



TRIFFIC LOCKED-OFF CAMERA



HAND SWASH (OR SWANSE) + HAND CRASH INTO FRAME (FORGETS)



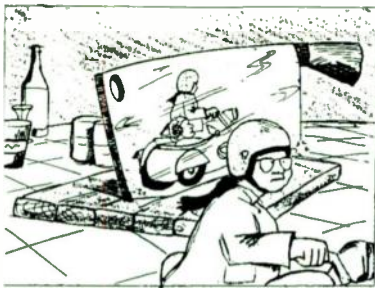
PUSH / THEY ARE FLYING TOWARDS THE OBSTACLE - SPEED UP IN THE MILD (MOMENT BEYOND OVER)



PUSH UP OUT OF FRAME - AS MABLE. CLARISSA LOOKS BLEED-OFF / JENNIFER EXCITED.



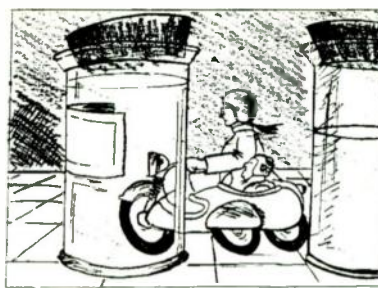
LYRIC: "GREAT THEY APPROACH"



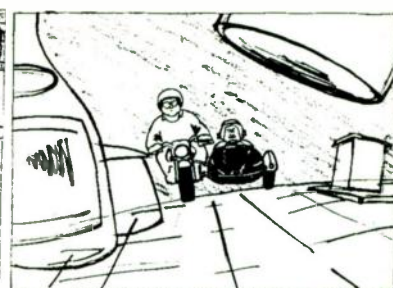
They reflect in a shiny meat cleaver as they ride past.



THEY LAUN AT EACH OTHER - EXCITED.



They are now 2d 'cutouts' animating in 3d space. They ride across the table, behind jars which distort them as they go past.



FACE IS/SCAR RIDES TOWARDS LOCKED-OFF CAMERA.

orchestra, programme a computer-based sequencer or calculate frame numbers — isn't an admission of inability: it's the mark of true professionalism.

TRIFFIC

BAFTA-nominated animator Tim Searle has dealt with dozens of composers during his career. "Most are totally aware of the extreme pressures that this aspect of filming exerts and have a good approach to their side of the process. But sometimes you have to put up with self-important idiots, usually wearing pink leopardskin spandex trousers, giving it a large one about how they see their music portraying the mood of the piece and lifting the animation to a higher plane of realism... blah blah blah. Then, when they finally deliver their work, usually way over time, it sounds like someone playing a nursery rhyme on a Bontempi Organ with one finger."

To generalise (enough for the above-average music composer to understand), animation is produced in one of three ways: Cell, Computer Generated Animation, or Pixelation. Triffic Films have a very distinctive, some might say 'pacey', style of animation, despite using every technique available, either singly or in combination. Talking of which...

CELL

Cell animation is where a different picture is created on different layers of acetate for each individual shot. Often the only alteration to a shot is in the shape of the character's mouth. The face and body are on separate acetate, along with other characters and movable objects, laid against a stationary background.

This is a time-consuming affair (for the animator), which works both for and against the

"One of the most rewarding jobs a composer can ever do is write music for animation."

composer. On one hand it allows plenty of time to work on the music and get a general feel for the look of the piece, as you get to see lots of different (still) pictures as they are created, drawn and coloured in. But it also means that you'll have to compose your music to an accurate template (of hit-point frame numbers and a storyboard), which must be bang-on when their moving pictures and your music marry up. When the pictures and the sound don't come together, it is much easier for you to completely re-do the score rather than for them to redraw a minimum of 720 pictures per minute.

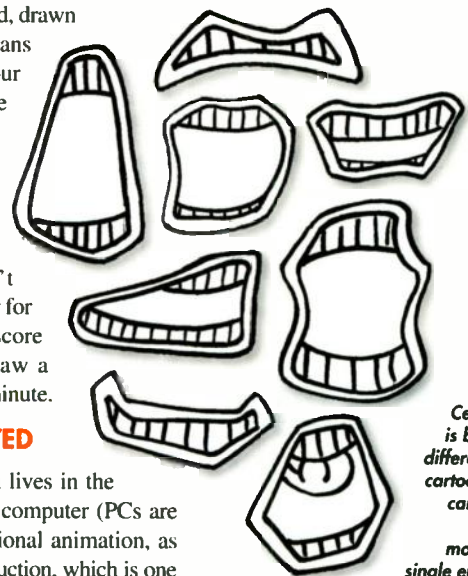
COMPUTER GENERATED

Computer-generated animation lives in the brain of an Apple Power Mac computer (PCs are rarely, if ever, used in professional animation, as reliability is a key factor in production, which is one thing PCs can't guarantee). The animation packages available get more comprehensive by the day, and can bend considerably to accommodate the groove of your music. But don't get cocky. The very versatility of computer animation means that animation sequences are re-arranged and new ones added at the drop of a hat — so your groovy music (completely cast in stone, as far as you're concerned) may need an extra five seconds in the middle of your favourite bit, in order to accommodate the extra footage just added... and can they have it now, please, they're waiting!

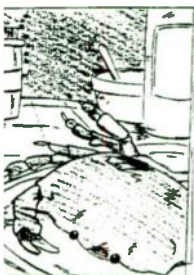
Luckily, hard disk systems work just as well for composers — in fact, a good hard disk editor can often be the only way of fixing the unfixable at a moment's notice, which is all you'll get.

PIXELATION

If you've ever watched the Wallace And Gromit films or *The Magic Roundabout*, you've seen pixelation (or single-frame animation, or claymation). Small, precision-made models that have joints (in their limbs) are moved a minuscule amount 12 times every second. This is an incredibly time-consuming



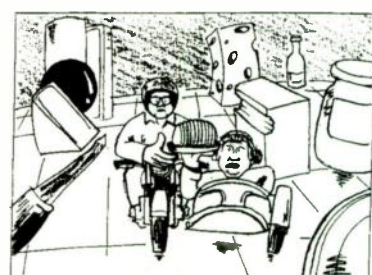
Cell animation is built up from different layers: a cartoon character can stay static, with just the movement of a single element, such as their mouth or eyes, to give the illusion of continuous motion.



TAKT... foreground



Lyric: "Grab them... CANE CLANCA" Jennifer points, Clarissa reaches out.



Lyric: "Beat That Meat Jennifer" Clarissa pulls out a giant joint and offers it to Jennifer.





"Doesn't the Pheasant Look Pheasant"
Both sing and point.



Claressa pulls out a bloody great gun and fires it.



CLARESSA SHOTS HER WAY THROUGH SHAGBLES TO
CATCH THE BIRD AS IT HEADS TO THE GLASS - THEY LEAVE
FRAME AS IF NOT ANIMATING THE BIRD STYLE

Writing Music For Animation

► process for the animator (the models are designed, constructed and filmed at a rate which produces one second of finished film every two hours). This means that the composer will have a lot of time to develop ideas and a general feel for their music. However, in the end you may find you have precious little time to actually finish an accurate musical framework that fits with the animation's timing, as you won't be able to see how a scene works until it's actually complete. Having said that, there are times when an

animator will be happy to work to a time-frame that's been decided beforehand — for example, when there is a 'non-limb moving' action scene (say, Wallace driving somewhere in his car) for which the music has been scored, recorded and plotted for a specific time-frame (see Dope Sheets, below).

STORYBOARDS

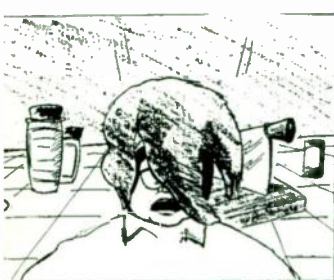
Storyboards are the first (and usually the only) clue a composer will get to how the finished piece of animation will eventually look. But it is vitally important to remember that the pace of the storyboard is *not* in step with the timeline of the action. One picture can account for 10 seconds of film, and 10 pictures can account for one second of film. In fact, animators more often than not have no firm pace in mind to their work at the storyboard stage. The input of a composer (who can convey musical ideas in split-second terms) early on, can help to concentrate their minds towards setting the pace of the piece.

Being able to give the animator a rough demo in strict tempo (or, more likely, strict multiple tempos), with a visual breakdown of the musical hit-points where the action and the music work in perfect harmony, is of enormous benefit. A simple way of doing this is to sequence your idea on your chosen software package, and record a single track which simply marks any useful hit points (a crash cymbal when the strings come in; the start and end point of a piano glissando, and so on).

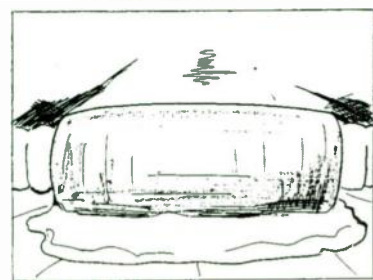
DOPE SHEETS

When the animation and/or the music is cast in stone, it is mapped out on a dope sheet. This is a breakdown of every frame of film used in the sequence — background blocks, character

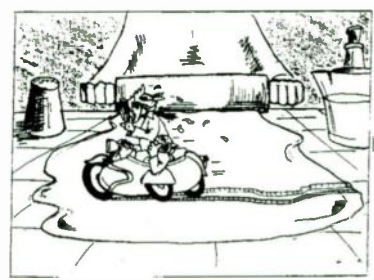
HERE'S THE DOPE...
These are dope sheets (see below, right) for the ITV series *Class*. Each second is split into 25 frames of animated film. The musical hit points are marked for the animator to work to. Every animated shot takes up two frames.



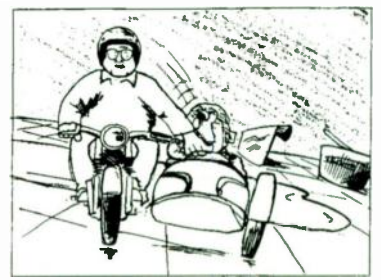
Pheasant lands on Jennifer's head



Large hands roll out dough back and forth with rolling pin.



They ride across leaving tyre-prints in the dough. They all miss the rolling pin



Jennifer pulls off the bird and shows it into Claressa's slobber

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Writing Music for Animation

BY THE NUMBERS

When you're working with animators, frame numbers become vitally important. Although complete accuracy between music and pictures is nearly impossible to achieve, it is worth being able to see where the nearest beat hits, to match up with an appropriate frame (hit-point). Below is a chart calibrating the millisecond division of one second for both 24 frames per second and 25 frames per second, regardless of musical tempo. Changing the Beats Per Minute (bpm) slightly can often make all the difference when trying to make musical sense out of a storyboarded animation sequence.

• 25 frames in ms

000: 1	040: 2
080: 3	120: 4
160: 5	200: 6
240: 7	280: 8
320: 9	360: 10
400: 11	440: 12
480: 13	520: 14
560: 15	600: 16
640: 17	680: 18
720: 19	760: 20
800: 21	840: 22
880: 23	920: 24
960: 25	

• 24 frames in ms

000: 1	042: 2
084: 3	125: 4
167: 5	209: 6
250: 7	292: 8
334: 9	375: 10
417: 11	459: 12
500: 13	542: 14
584: 15	625: 16
667: 17	709: 18
750: 19	792: 20
834: 21	875: 22
917: 23	959: 24

▶ animation, physical movements — as well as musical hit-points. If you compose music that sets the pace of the animation and you have no knowledge as to how to dope the music out, this can be done by a line producer.

The first time you will see pictures accompanying your music is on an 'Animatic'. This is a process whereby the music track is dubbed onto a video and the storyboard stills are superimposed at the relevant points. As the animation is completed in draft form, the Animatic is updated. This process is part of another process used in animation, called Line Testing or Leica. This is where the outline of the image, without colour or background, is put onto video to see how the pace and movement look for specific scenes.

GETTING INSPIRED

If you're writing for animated pictures, you must be able to compose music which can complement action with a resolution of 24 or 25 frames per second, depending on what process is being used. And whatever you do, make sure you know how many frames per second the animator is working to, or your hit-points will be woefully out of sync with the pictures. Most animation shoots two frames per separate image; it can be three frames per image, but is never more than four.

When you actually do start to compose for animation, setting the tempo or tempos is a good place to start. If you use a sequencer to write on (doesn't everybody?), switch the edit page frame of reference to 'position in Milliseconds' and not 'position in Frames'. The reason for this will become evident in a moment.

STICK WITH THE CLICK

Record a click track onto the sequencer, as opposed to using the automatic one that keeps time when in record mode. This will give you an audio, visual and numbered mark to where the beat falls. It's most likely that the piece you will be working on is a 30-second sequence, therefore you should have a separate sound marking the end point. This is the

FURTHER READING

For a complete guide to understanding the technicalities of composing for animation (and all film scoring), there is really only one book you need: *On The Track — A Guide To Contemporary Film Scoring*, by Fred Karlin and Rayburn Wright. It is only available as an import and will set you back the best part of £50. From the foreword by John Williams (*Star Wars* trilogy, *Indiana Jones* trilogy, *Jaws*, *Schindlers List*, *ET*, *Jurassic Park*, and so on,

and so on), to the comprehensive and complete Click Book at the back (see 'In the Frame' box), it covers everything you'll ever need to know about making music for film. All the current top Hollywood composers give anecdotal advice and helpful tips alongside examples of their actual film scores. There's simply no other book on the market that comes anywhere close, but on enquiring with the wholesaler, I found that there seem to be only three copies in the country at present, so get down to your local bookshop and place an order now!



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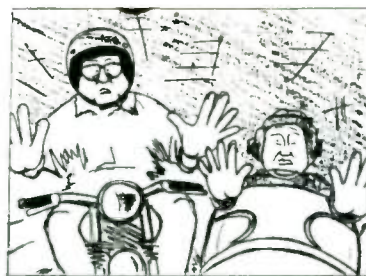
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Ooo



Er



Shocked faces



Writing Music For Animation

► point where every part of the music should have finished, and *not* the last beat of the tune. Once you've done this, use other percussion sounds to highlight the locations of the relevant hit-points you

wish to catch, and jot down what sound corresponds to what action. Using the relevant millisecond chart (see 'By The Numbers' box), you should be able to approximately play the hit points in live and adjust them to the exact point in the action. Then, using your musical ear, push or pull the hit points to make rhythmic sense. Most sequencer users are expert in delaying tracks in milliseconds.

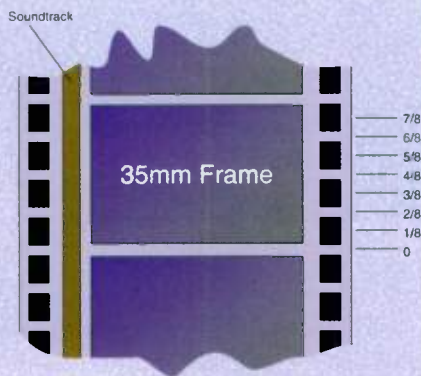
As a point of interest, if it's a sudden crash, smash or bash-type action, it will be better for your musical punctuation to fall just after the motion, as the sound should reinforce the visuals, not preempt them. However, if it's a regular action, like a footstep, a clock ticking, or an off-screen noise, it's better to make the sound fall slightly early.

YOU MUST BE JOKING

Animation music may seem like an extremely dangerous avenue to go down, but if you can cope with it there's no other medium which will ever cause

IN THE FRAME

Long before SMPTE, MIDI and millisecond read-outs on software sequencer packages, accurate synchronisation was demanded in the film industry. Most film is shot on 35mm stock, including 70mm widescreen digital. For every frame of film there are four sprocket holes each side, giving a constant division of an eighth (0.125) of a frame — or, to put it another way, every second is split into 192. Music can be, and has historically been, plotted with pinpoint accuracy using this calibration, although a click chart is essential for this method (see 'Further Reading' box).



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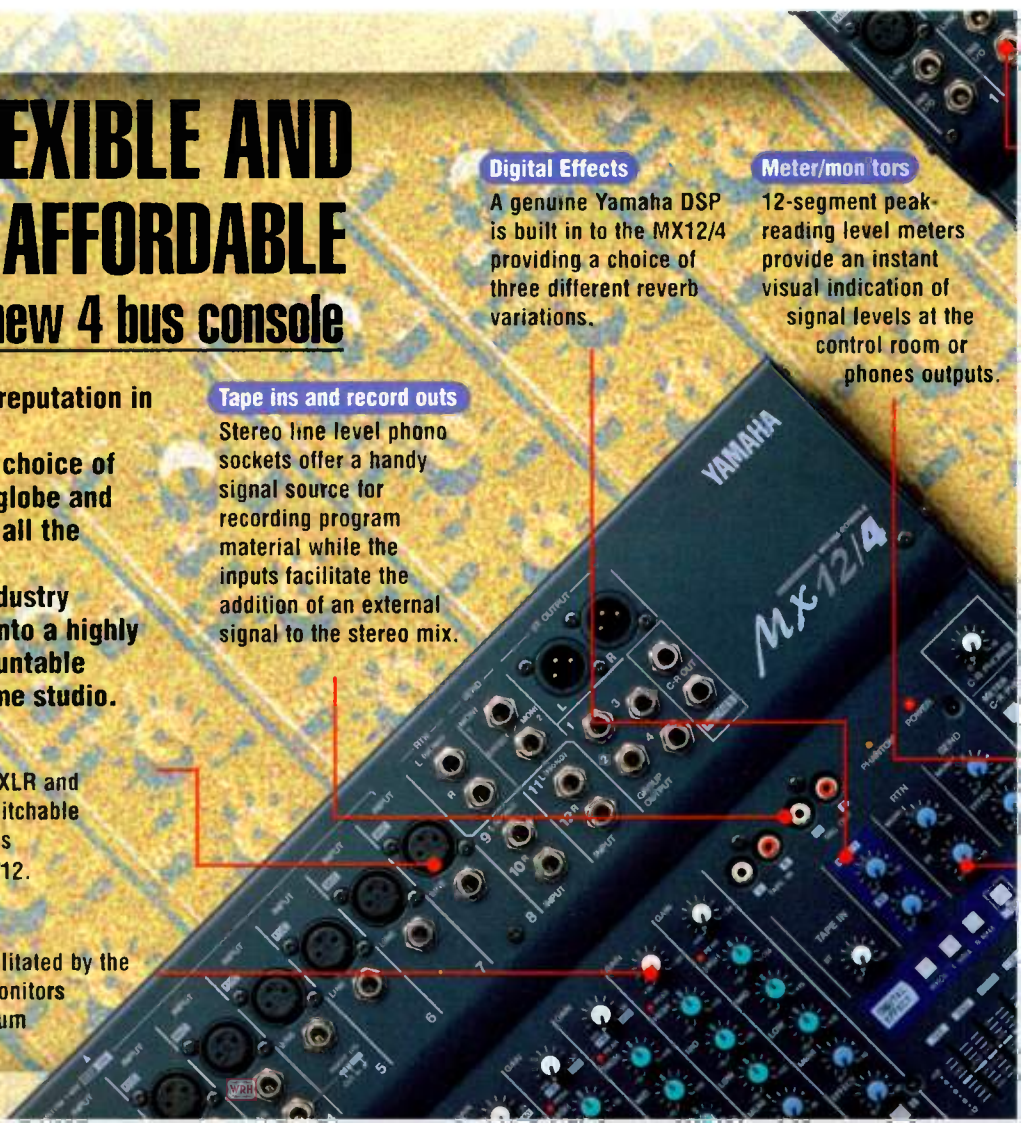
A genuine Yamaha DSP is built in to the MX12/4 providing a choice of three different reverb variations.

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12-segment peak-reading level meters provide an instant visual indication of signal levels at the control room or phones outputs.

Tape ins and record outs

Stereo line level phono sockets offer a handy signal source for recording program material while the inputs facilitate the addition of an external signal to the stereo mix.

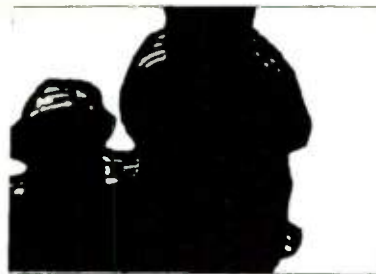




note to back - ABC to the back



Silhouette-shaped hole in book. Hold for title and zoom to silhouette. black. end



note to back - 2x frames



you fear afterwards. Scoring a big-budget Hollywood blockbusting movie is a trivial task in comparison to writing soundtracks for animation. And there's plenty of animation work around these days: TV signature tunes, commercials, government training videos, film school graduate shorts, art films, TV, satellite and cable station logos: the list is virtually endless. There really is every chance of you becoming one of the new breed of young, happening, serious composers.

In Britain we are blessed with some wonderful composers, in particular the girl power trio of Anne Dudley, Rachel Portman and Debbie Wiseman. Sadly, we're also cursed with a musical establishment packed to the gills with chummy PR-influenced snobs who seem to be impressed by people who wear pink leopardskin spandex trousers. Plus, our film industry may contain the finest technicians in the world and make the most thought-provoking films, but it can't compete with the trillion-dollar Hollywood macho garbage that gets shown every week at your local 10-screen (USA-owned) multiplex cinema.

The best thing about the Hollywood system is

WHO IS BIG GEORGE?

Big George is currently composing *The Childrens' Symphony* which includes the voices of 7000+ children between the ages of 8 and 12 singing musical phrases and textures. It's being compiled on a hard disk recording system, using Emagic's *Logic Audio*, and will include over one million

musical notes. The world premier is scheduled for September 1998 on BBC Radio 3.

Over the past decade, George has composed numerous animation title sequences for TV programmes, two MTV Idents, a variety of TV ads, an award-winning environmental film, *Lead Free*, and *Round the Bend*, a

childrens' series which included cell, pixelation and computer-generated animation sequences.

He has also worked as a line producer on a wide range of TV animated sequences and dozens of animated pop videos. An expert on all aspects of film music production, he is currently available to score the music for any Hollywood blockbuster movie in production!

the soundtrack music being made. That doesn't include the shameless exploitation of third-rate tracks by has-been artists who just happen to have a business (or marriage) tie-up with an executive in the distribution company.

All the great composers living today work in films. If Beethoven or Mozart were alive now, the last thing they'd be doing is trying to become part of the Proms elite or South Bank chic; they'd be scoring film and cartoon soundtracks.

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Carl Stalling: Toonsmith Extraordinaire

A man whose name you won't find in any directory of composers, but who is probably the most enjoyed and listened-to composer of all time, is Carl Stalling. He was a musical giant who had complete mastery of every style of music ever played in his lifetime and before, and, apart from making the first recorded sound ever heard in a cinema, single-handedly invented most of the methods and tools of film composition still being used today. He may not have the academic profile of Igor Stravinsky and Sergei Prokofiev, or the PR of John Cage and Michael Nyman, but he has, without any



doubt, made far more people happy with his music. It's one of the biggest scandals in history that his genius has not been recognised but, thanks to the best serious music periodical known to humanity (*Sound On Sound*), all that is about to change.

So who was Carl Stalling?

Born in Lexington, Missouri at the end of the last century, Stalling started playing piano at six. By the age of 12, he was the principal piano accompanist in his hometown's silent movie house, and by the time he was in his early twenties was conducting his own orchestra and improvising on the organ at the legendary Isis Movie Theatre in Kansas City.

In 1920 Kansas City was the centre of the animation world, and it was there that Stalling first met and worked with a young artist called Walt Disney. Shortly after that meeting, Stalling moved out to Los Angeles, the hub of the silent movie world, to seek work in the keenly anticipated but non-existent Talking Pictures. On arrival, he found a pioneering

town run by short-sighted olive oil salesmen, but craving visionaries: so he sent for Disney, loaning him \$2,000 to open his first studio in Hollywood. It was here that Stalling was to invent the process of scoring for animation and the tick system (click track), both still industry standards. He composed Disney's legendary *Silly Symphonies*, the first sound movie the world ever saw, and was the early voice of Mickey Mouse.

Stalling left Disney after a couple of years to join Ub Iwerks (another Kansas emigrant) and score the *Flip the Frog* cartoon series. Then, in 1936, he was asked by Warner Brothers to join their new and anarchic animation department, to compose the music for their cartoon shorts, at a rate of one per week. The famous 'BOINNGGG darrrr da da da dar!' fanfare which graces the start and end of every *Looney Tunes* and *Merrie Melodies* is his! So is the music for every single Bugs Bunny, Road Runner, Tweety Pie cartoon — the list goes on and on.

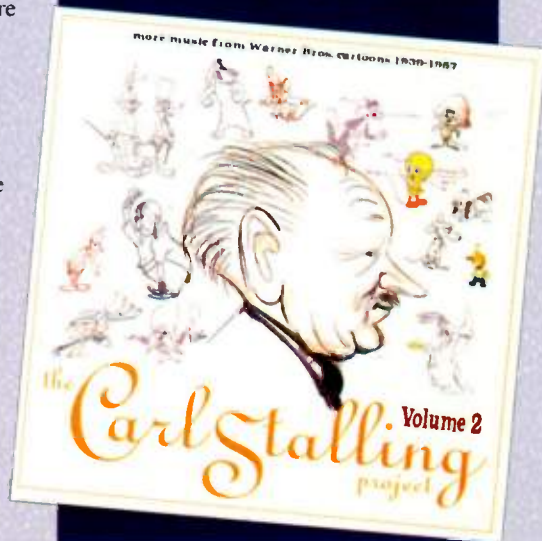
During his 22 years at Warner Brothers (1936-58), Stalling had a small office where he spent four days a week sweating over some of the most complex musical scores ever written. With the help of the mad but brilliant orchestrator Milt Franklyn, the sound effects pioneer Treg Brown and the vocal wizard Mel Blanc, every week a new masterpiece was born. Once a week there was a short session with the Warner Brothers in-house orchestra, which just happened to be the Los Angeles Philharmonic (probably the greatest bunch of sight-reading musicians that ever lived) doing a bit of moonlighting. Next time you watch a *Merrie Melodies* cartoon, close your eyes, listen to the music and be amazed that 64 people are probably playing (and sight-reading) that piece first take.

Stalling wrote over 1200 symphonies lasting, on average, six minutes, with musical themes embodied within the cartoon characters that stand alongside the work of all the recognised masters. Apart from his own stream of musical consciousness, Stalling liberally borrowed, re-arranged and pastiched other composers, from classical greats to fellow Warners staff composers. His adaptations of the classics were far more accessible to an audience and more sympathetically arranged for an orchestra than when originally conceived. Two extremely notable cartoon composers who both owe a great

debt to Stalling's ground-breaking, and as yet unequalled, body of work are Scott Bradley (*Tom & Jerry*) and Danny Elfman (*The Simpsons* — which, incidentally, uses the biggest orchestra for a TV series in the world today).

And why is Carl Stalling the most enjoyed composer of all time? Simple, if you're into punk rock or hardcore techno it's doubtful whether Mozart or Bruckner will stir any emotion in you, and not everybody likes the Beatles or the Spice Girls, but here's a composer who has touched the entire world. Throughout Stalling's working life, the main form of mass entertainment was the cinema. The Warner Brothers cartoons were the longest-running and most popular series of films ever made. The films, with Stalling's soundtrack, were distributed across the world and dubbed into all languages. Not long after his retirement his music was introduced to an even bigger audience and heard by just about every child, parent and grandparent again, when these same cartoons started to be endlessly re-run on television sets around the world. To this day they are broadcast continually in every country on the planet.

Some of Carl Stalling's Warner Brothers' cartoon music can be obtained on CD: *The Carl Stalling Project Volume 1 and 2* are US imports and not that easy to come by in the UK. However, we found them stocked by the Cheap or What CDs web site (<http://www.demon.co.uk/pastel/index/html>). The company can be contacted by more conventional means at PastelBlue Ltd, 115 Deeds Grove, High Wycombe, Bucks HP12 3NY, but the best bet is to check out the web site if you can, for details of prices and postage costs.



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 at all levels, in a compact, all-in-one design.
 Two banks of fully-usable and multi-
 effect algorithms choose one strategy to
 help you enter the zone of tone. With ART's
 exclusive flow control, your processing
 can be enhanced with more of the
 right effect naturally. Dual mode
 processing allows you to produce a tone
 with dual elements with easily-replaceable
 effects. The ultimate in portable input
 processing!

ART's Tube MP, like its previous,
 high-performance tube pre-amp
 has enhanced warmth for both right
 and mono gear. Simply place it
 on any line or your record. Connect
 a direct line, feature could be used
 anytime, record sound better!



As well, a multi-processor algorithm that provides the sound
 quality of dedicated high-end processors. Use the Effects
 Network as a reverb, and the variable interface helps you
 to find the right of it. With a variety of effects and both the
 input and output are right there with you. If you don't have
 the budget for a direct-reverb processor and one half of the
 time and interface between a multi-processor, the Effects
 Network is the answer.

**EFFECTS
NETWORK
£299**



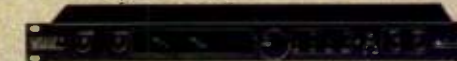
Both of these series 2-channel digital multi-effects
 processors feature Dual Processing
 and ART's ASIC audio chip, providing
 astounding quality at an unbelievable price.
 The FXR is a quick set-up, plug and play
 processor with 255 presets.

**FXR
£149**



The new FXR Elite II adds MIDI real time
 control, MIDI mapping and the ability to edit
 parameters and store your changes. It takes
 the proven, popular technology of the
 original FXR elite programmable multi-
 effect processor and introduces a more
 intuitive, more powerful interface.

**ELITE II
£199**



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KORG KORG OPEN DAYS



The opportunity that's brought you such classics as the M1 and O1W continue in that fine tradition, by giving us the current prophecy and multiple Trinity option keyboards. As a big supporter of the Korg range of products we are delighted to have these many other of Korg's wonderful range of products in stock for you to try. Also watch our adds for the upcoming Music Connections Korg launch of these stunning new synth. This will be a ticket affair, space will be limited. So don't delay. PHONE AND BOOK YOUR SPACE.

Dear customer, have we got a treat for you. Korg have this habit of coming up with hit keyboards every so often, and this years offering should be a monster hit!

In July & August with Korg's assistance we will be holding six open day's with their fabulous new Z1 on demonstration. This will be limited so if you would like to have a preview of this amazing new synth, plus a look at the 168RC Desk & 12/12 don't miss this great opportunity. Just call the store closest to you for details. What could be simpler.

PRICE BEAT



Roland



We can go from a JP to an MC to a JV-RD-1K We're not sure that our competition can.



Sound Generators Nord Lead is the first digital synthesizer to use "Virtual Analog Synthesis". This has analyzed analog synthesizer design in detail and implemented the research in a digital model. Nord Lead employs mathematical simulations of the electrical signal generated by analog oscillators, instead of using wave form tables. This makes it possible, for example, to sweep the pitch smoothly over a very wide range and allow for true pulse width modulation.

Voices - 4 (expandable to 12, 4 part multi-timbral).

Special Features - Velocity programming. Each function, controlled by a knob, can be programmed to velocity. Morphing. Each function, controlled by a knob, can also be controlled by the modulation wheel pedal to continuously fade between two values.

Performance controllers - 4 octave velocity sensitive keyboard with octave shift buttons (8 oct.). Modulation wheel, the "Pitch Stick" (features no dead zone at zero crossing), pedal input for sustain or expression pedal. Patent pending for the "Pitch stick".

Oscillator section - Two oscillators generating triangle, sawtooth or pulse (with adjustable width) waveforms. Oscillator 2 can also generate noise with a colour control. Oscillator 2 can be hard "sync'd" to oscillator 1. Linear deep frequency modulation of osc 1 from osc 2.

Filter section - 12dB "2 pole" lowpass, 24dB "4 pole" lowpass, bandpass or highpass. Cut off, resonance, envelope amount, envelope amount controlled by velocity, keyboard tracking and ADSR envelope.

Amplifier section - ADSR envelope, gain control.

Modulation section - LFO 1 generating triangle, saw or random routed to Osc 1 & 2, Osc 2, filter or pulse width. LFO 2 produces a triangle waveform, routed to Osc 1 and 2 or amplifier. Rate controls the rate for the arpeggiation. Arpeggiation: Range: 1-4 octave. Modes: Up, down, up/down. Modulation: envelope (attack, decay) for osc 2 pitch or FM amount.

Performance section - Play mode: poly, legato, retrigger, unison mono, unison poly. Manual mode: 4 program slots for layering possibilities. Portamento: auto portamento. Studio out: Stereo output, Master stereo, mono and multitimbral (AC/BD) mode. Headphones out. Stereo 18 bit DAC.

Memory - 40 user programs, 59 factory programmes and 100 factory performances. With the 4 voice expansion card, the Nord Lead can hold an additional 297 (99x3) user-programmes and 393 user-performance programs on a PC/MCIA 128 kilobyte battery backed RAM chip.

MIDI features - All control knobs and switches for program editing send and receive. Control Change messages. System exclusive bells damps. One program or all programs. MIDI clock/syncronizing LFO 1 and LFO 2 to ppg/aur. Triggering of the filter and amplifier envelopes and velocity control from separate programmable MIDI channel and note numbers.



RACK
£795

SYNTH
£995

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ENSONIQ



Want it... different? These days very few synths can make you sound unique. However one manufacturer namely Ensoniq can. At Music Connections we realise that Ensoniq is a wonderful noise synthesizer manufacturer. Very few synthesizers sound as distinctive as an Ensoniq. That's why many top artists around the world don't want you to use Ensoniq. Otherwise they won't sound as unique anymore. If you haven't tried one of Ensoniq's new synths or their stunning new groove machine the ASRX, you really don't know what you're missing.

ENSONIQ ASR-X

We went to the masters of sampling and asked them to put the top features they would like to use in the ultimate groove machine. They said to make it easy to sample, re-sample and loop, include a built-in synthesizer with incredible effects, resonant filters, an easy to use sequencer and put it all into a portable box with pads.

IT WAS TIME TO TAKE SAMPLING TO WHOLE NEW LEVEL - So we took the best features of the famous ASR-10, added great sounding 20-bit A/D converters, made the RAM expandable to 34MB and stuffed all this into one portable table top box. We put a lot of effort into making it extremely fast and fun. Just sample, shoot it to a pad and start jamming. Never before has so much power been so easy to use. The ASR-X is expandable in many ways. You can add up to 34 MB of RAM for sampling, add an EXP synth expansion board, or add 8 outputs or SCSI. Every aspect of the interface was developed to be fun and easy to use. After all, you probably write your best grooves when you're having a great time. The 14 custom designed velocity sensitive pads feel great. They're fast and responsive, smooth and sensitive, just begin to be hit. Our new VLSI 24-bit digital signal processor with 26 MIPS of DSP power gives you incredible sounding FX. That power can be used to make your sound more stereo or bolder, rich or thin, big or small. There are plenty of fun effects like Chatterbox, Vocal morph and speaker. In fact you can also use the Low-Fi processing algorithm to get that cool muffled sound.



MR RACK
 RRP
 £899

Steinberg

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ReBirth Techno Micro Composer RB-338

Software synthesis / Two Bass Lines / One Rhythm Section / Digital Delay / Distortion / Integrated Sequencer / Full Automation

Believe the unbelievable

propellerhead SOFTWARE

Digital Audio Recording Technology

EMAGIC

We stock Emagic's most innovative and popular technology, from Logic Audio to the very latest Audiowerk8 software. Call us for details

AKAI

As we are the UK's largest AKAI retailer you can be sure that you will find units on show and on demo in all of our MUSIC CONNECTIONS stores.

YAMAHA

If it's YAMAHA you want then we've got it, all the latest hi-tech and pro-audio equipment in stock and on show. So if you want one of YAMAHA's great new toys even the ANIX synthesizer give us a call!



E-MU

EMU E-SYNTH

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

- Up to 128 note polyphonic
- Up to 32MB High Quality ROM sounds
- Up to 32MB Multi-instrument with voice card
- 16 Outputs
- Regional Modulator Synthesizer
- 64 x 6 Pole Filters with 2 filters
- 24 bit stereo effects
- Advanced 48 track sequencer
- Stereo sampling up to 84MB
- Digital Resampling
- Pic & Axi: Editor included
- SCSI interface & 2 Great Cdr-Roms included

With all this standard spec, you realise you can live without this great new music from EMU. CALL US FOR DETAILS.

As probably the country's largest EMU retailer, you will always find their latest offering in our stores first. We believe EMU equipment to be second to none and we are proud to have their equipment on show & on demo in our stores. Great deals available on all EMU equipment, if you would like an example just check out the great offer on Darwin on our Hard Disk Recording Page.

E4X

For the big boys

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DR16
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WE HAVE SUPERB PACKAGE DEALS AVAILABLE ON AKAI PRODUCTS CALL FOR DETAILS.

EMU DARWIN EXCLUSIVE

Just when you thought you had found your favourite digital recording package to use, EMU had to go! So, dear Steve, do you remember the **DARWIN**? This wonderful piece of equipment developed by EMU but unaffordable by you. Well EMU think you have had a change of heart. Exclusive to Music Connections we bring you that exact piece of equipment for the amazing sum of **£1499** ~~£1999~~.

Yes that's right just **£1499**. Now when we heard this news we had to stop and think? Is there anything that's comparable at anywhere near the price to this amazing piece of equipment. To tell you the truth, we don't think so. And could this now, really be the end of tape based recorders as we knew them?

This machine is so capable that it is impossible to tell you everything about it in an advert, and really you should see it in the flesh to see just what amazing value this represents. So if you were thinking of a tape based machine, maybe you should think again. Give us a call, come and try it, or forever stay in the dark ages. This offer is limited to first come, first served.

Inherits the BARWIN's 1 track Virtual Hard Disk Recorder from the Systems DARWIN is a stand alone random access recorder that features screen-based digital audio workstation (DAW) style recording capabilities, tape based systems ease of use, and a price point competitive with ADAT and DA-DA modular multitrack recorders. What does that mean to you? Well DARWIN is much more than a simple recording device. DARWIN is a creature that will assist which will stimulate your imagination and allow your recordings to evolve as quickly as your ideas. Forget the intricacies of traditional tape based recording, DARWIN delivers the mind-boggling power of non-destructive random access and recording editing. Consider being able to cut and paste that riff you could only get right once, over and over throughout a song, seamlessly and effortlessly. Or, completely change the structure of a song - dozens of different ways with just a few key strokes - without affecting your tape cuts. Or, instantly insert that once in a while special track you accidentally punched in on and wiped out. DARWIN will do it all.

Advanced DAW features?

Absolutely. Try on DARWIN's high resolution graphic display, or multi-resolution pixel-style editing, or multiple levels of undo. And these are just the tip of the iceberg.

Want more than 8 tracks?

No problem. Up to four DARWIN units can be daisy-chained together for 32 instantly accessible tracks. Of course DARWIN can also be used as an expander to a tape-based multitrack. But most amazing of all is the unlimited track capability via a single DARWIN through it's Virtual Slave Rec (VSR) feature. Using VSR, you can instantly create new versions of a project that can then be used for recording additional tracks. The number of additional tracks that can be created with VSR is limited only by your available disk space.

In addition to the already proven expansion units include ADAT sync Optimizer card, ADAT Digital I/O card and 4 input expander card (EMU are dedicated to improving an already excellent machine. Recently enhanced to the new DSP card with a 32 bit floating processor for increased punchability, gain and compression and soon to be released in the SMPTE time code card allowing E-Dance to be linked together and features the best interaction with ADAT time to date.



POINTS OF INTEREST:

THE CARD - INCREDIBLE POWER:

At the centre of the PARIS system is the powerful EDS-1000 card. This PCI card not only manages all audio I/O but also packs heavy duty signal processing power. It uses six of ENSONIQ'S most powerful ESP-2 custom signal processor chips to do an entire studio's worth of work.

THE EDS-1000 PROVIDES:

PARIS-1000 provides mixing for 32 channels of audio with sends to as many as 16 mono or eight stereo aux buses, 20 inputs and 20 outputs with full 24-bit resolution, 24 streams of 24-bit audio data, 32 digital parametric EQ's, simultaneous multiple effects and a 175-point patchbay.

TWO PLATFORMS, ONE SOLUTION:

PARIS works identically on both Pentium PC and PowerPC Macintosh computers - and the same card plugs into both. Unlike older ISA and NuBus cards, the EDS-1000 card takes advantage of the huge bandwidth of the PCI bus, which allows it to play back 24 streams of digital audio, all without taxing the computer's main processor.

EFFECTS:

PARIS comes with a library of world class reverbs, compressors, EQ's and popular digital effects right out of the box. And they all run in real time! For even more variety and special applications, additional libraries and third party plug-in modules will be available.

PARIS

ensoniq

ENSONIQ PARIS™

20-bit Multitrack Recording System

PARIS is the most advanced digital audio recording system ever developed. PARIS seamlessly integrates digital audio recording, object orientated editing, digital mixing with automation, real-time effects processing and MIDI sequencing into an intuitive and flexible environment. PARIS grows to meet your needs with a dedicated control surface and a family of expanding input/output modules. Powered by ENSONIQ DSP technology on a cross platform PCI card, PARIS delivers a total audio recording solution at a revolutionary price.



**PARIS
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ProTools
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If you only use Pro Tools, Mackie's HUI multi console can boost your productivity and your creativity!

Now you can literally get your hands on ProTools digital audio workstation software. Mackie Design's HUI is designed to control and respond to Digidesign's ProTools Version 4.0 and in the near future, EAF compatible software too. HUI lets you mix via a real, tactile control surface complete with motorized faders, rather than with a mouse or a unidirectional fader pack. Perform real-time, hands-on multi-channel fades, muting, select and adjust sends, create subgroups, and change dynamics. In short: track and mix down just the way you would on a large, automated console, yet with complete bi-directional interaction with ProTools 4.0. HUI will immediately reflect all standard mixing values, functions and pointers. HUI controller architecture supports standard MIDI protocol in either 7-bit or higher resolution 9-bit applications as well as utilizing simple controller and note values. Rear panel I/O includes analog jacks (three stereo audio pairs), a footswitch jack, AD9 mouse thru, MIDI in and out and RS422 ports for direct computer connections.

AUDIOMEDIA III
first available call for details.



Fostex

D-90
£CALL

- True multitrack recording
- CD Quality recording and playback
- Removable Front Panel Recorder
- Unique "Visual Ready"
- Cat, Copy, Paste & Delete Editing
- 8, 16 or 24 Tracks
- Analog & Digital I/O
- Flexible Loudness Processor

Fostex D-90
Series digital recorder lets you be better than with 12 bit recording, some with compression, some even support you to accept external sample rates. Professionals don't accept their own control as they should test. The ease of the mixer is that CD quality recording demands that those in for maximum signal to analog conversion at a sample rate of 44.1 kHz.

A sophisticated search the Fostex D-90 is made with ease. With it you'll find EAF, CPU, the recording machine gives it speed of CD quality recording and playback, so it has an internal 16 MB hard drive which is optional.



D-160
£CALL

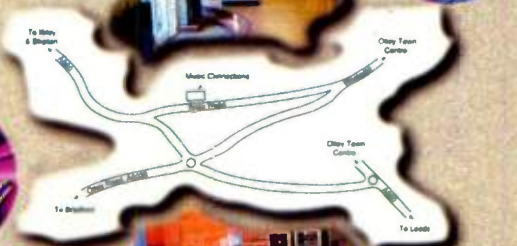
Roland

ROLAND VS-880
For anyone who's ever felt the limitations of tap-based multitrack recording, the VS880 is the product you've been waiting for. Poor sound quality, limited tracks, troublesome effects access and MIDI sync problems need no longer be part of your recording process. In the past, the only way to resolve these problems was to spend big bucks on complicated, multi-component systems. So maybe you had to settle for less. Or maybe you waited, hoping that the "next big thing" would have all the answers. Congratulations... your patience has paid off!



VS-880P
£CALL

NEW

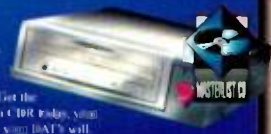


NEW

Don't think being the ultimate music access-storage device, a compressed optical speed CD-ROM and 800 MB direct to one half-track playback rate. With 600 Meg MB cartridges now retailing at a merely £39.00 this has got to be the most cost effective and reliable solution to all your storage problems. Mac owners can also use it as a standard CD player! Includes all software, SCSI cable and cartridge. Compatible with all current samplers.



Recordable CD-Roms support digidesign master file pins. Digidesign CD-Roms work with all remote applications (make always important) Recordable CD-Roms at unbeatable price! Get the American first start recording in CD-R today, your masters will last a lot longer than your DAT's will.



- CDR 200 £395
Dual speed record, Quad speed read (inc. software, cables & discs)
- CDR 400 £595
Quad speed multi-state of the art technology (inc. cables, software & discs)

emagic

EMAGIC
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Audiowork is a full recording card with 2 analog inputs, 8 individual outputs, and stereo digital I/O (S/P-DIF). Audiowork is fully compatible with any Mac OS or Windows 95 PC computer.



EVENT LAYLA - 24bit Multitrack Recording System

Record 24 bit digital tracks to each of 24 channels. Record your tracks in 24 bit. All combinations of 24 bit resolution and 24 bit sample rate are possible. 24 bit resolution and 24 bit sample rate are possible. 24 bit resolution and 24 bit sample rate are possible.

Play 24 bit digital tracks to each of 24 channels. Record your tracks in 24 bit. All combinations of 24 bit resolution and 24 bit sample rate are possible. 24 bit resolution and 24 bit sample rate are possible.

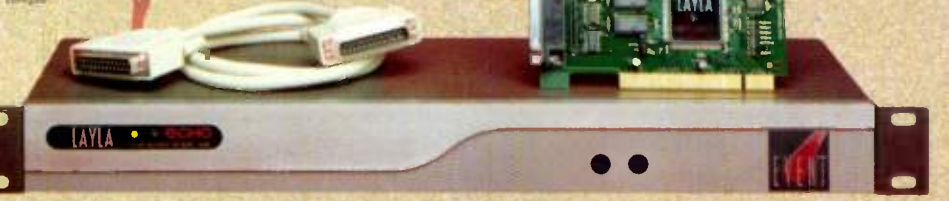
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EVENT

Layla
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KORG 1212I/O

KORG SOUNDLINK DRS

The 1212I/O PCI Multi-channel audio interface for Soundlink DRS features 12 inputs and 12 outputs configured as two analog I/O's, an S/PDIF I/O and an eight channel ADAT optical I/O for true multi-channel recording with PC. All I/O's can be used simultaneously for maximum interfacing flexibility.



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KORG 168RC



The best of the best! Ask us for the 168RC recording console. The 168RC is the first truly affordable fully digital 8-BUS recording console. Use it with your ADAT or other digital recorder equipped with the ADAT optical interface to create the best sounding recording's you've ever made. CALL FOR DETAILS.

YAMAHA

YAMAHA 03D

If you're ready for a compact, comfortably priced, full-featured digital mixer - one especially made for professional project and post production studios relying on modular digital multitrack recorders such as TASCAM, ADAT, AES EBU and YAMAHA digital formats - then you're ready for the 03D Digital Mixing Console. Nestled between the popular ProMix 01 - famed for bringing affordable digital mixing to the masses - and the award winning, industry standard 02R Digital Recording Console.



03D
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PROMIX
£CALL

YAMAHA PROMIX 01
Does your existing mixer make mixing seem hard? Then YAMAHA, the company with many ideas, would like to tell you about PROMIX 01 - the mixer with memory.



02R
£CALL

YAMAHA 02R
Out on it's own in a crowded marketplace. Visit our stores to see why the 02R has caused quite a sensation in the mixer market.



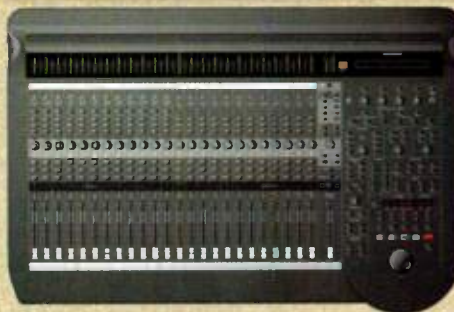
SOUNDTRAC

TOPAZ

A dedicated multitrack recording console must provide the following: Superb audio performance, exceptional equalization, versatile monitoring, comprehensive patching and 1st class ergonomics. All are in abundance in the stunning new Topaz Project Studio Console from Soundtrac.



TOPAZ
CALL
FOR
STUNNING
TOPAZ
PACKAGE
DEAL



DIGITAL 8-BUS

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



MACKIE.

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

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

Don't forget the Original Mackie 8-BUS

Still one of the leading mixing consoles in the world for reliability, sound quality, ease of use and ergonomics.

Put this together with our amazing price deals and you've got a serious machine at a serious price.

CALL FOR DETAILS!



COMPLETE MACKIE RANGE AVAILABLE AT ALL STORES!



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PreSonus

Audio Electronics

STOP PRESS...STUNNING NEW BLUE MAX

The DCP-8 is an eight channel, digitally controlled analog dynamics processor, plug it into the inserts of your mixer, MIDI it up to your sequencer and it will give you a compressor/limiter, a noise gate, automated fader levels, automated mutes and glitch free real-time control of parameters (even compression ratio) across all eight channels. Settings may be saved as a snapshot into one of the 100 user memories. A DCP-8 environment is available for EMAGIC Logic.

Presonus will make you a custom DCP-8 if you have a specific need that is not addressed in the stock unit, how's that for service!

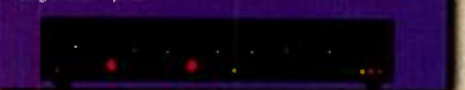
The ACP-8 is 8 high quality compressor gates housed in a steel 2U rack mount unit. Each compressor allows control of threshold, ratio, attack, release and output gain. Each is individually selectable for hard or soft knee, peak or auto compression. Each gate features threshold, release and attenuation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

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The REV500 is an extremely good digital reverb which can hold it's head up confidently in any company. In light of it's price, however it really is something special and certainly worthy of an audition. It may not represent the ultimate in reverb-emulations, but it's not very far off and certainly offers an affordable and worthwhile upgrade from it's ancestor.

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VOICE BOX

LA AUDIO MILLENNIUM MPX1 MIC PROCESSOR

Last year, every company had to have a small mixer in their portfolio; this year it seems that no respectable manufacturer can get by without having a voice channel as part of their product line. The channel concept isn't new, but this market was rather specialised until digital recording came along — then studio owners suddenly realised that they could make better recordings if they bypassed the mixer altogether. Now, with tapeless recording becoming the norm rather than a specialist sideline, mic channels have moved into the mainstream, as they provide a compact and affordable means of getting quality signals into these systems. LA Audio are one of the latest companies to jump on the bandwagon. Waiting until now to launch their contender has given them a chance to see what their competitors are up to, so it isn't necessary a bad thing. Even so, I'm sure that if you listen carefully, you'll be able to hear the creaking and groaning of a wagon axle that's already loaded well beyond its design capacity!

LA Audio have got off to a bit of a sticky start by giving their voice channel exactly the same name as Lexicon's latest multi-effects processor, but few people will mistake one for the other. LA's MPX1, aside from being entirely devoid of blue paint, is completely analogue, and combines a mic/line preamp, an expander gate, a compressor and a 4-band equaliser in a 1U, mains-powered rack case. Though the sections are arranged in series, the preamp, compressor, equaliser and main output stage have their own inputs and outputs on the rear panel, enabling them to be used individually or chained in a different order. The compressor also has a side-chain insert point, so you could patch in the equaliser for de-essing, though a basic de-essing filter is thoughtfully supplied as part of the compressor. All the individual ins and outs are on unbalanced jacks, with the exception of the mic/line input and the in/out connectors relating to the output section itself — the main output is simultaneously available on both a balanced XLR and an unbalanced -10dBV jack.

INPUT STAGE

The best way to cover a device like this is to take it a section at a time, starting with the preamp.

Obviously, the mic preamp is very important, because if it isn't better than what you'd get in a typical console, there's no real advantage in buying a unit such as this. LA have based their preamp stage around the SSM 2017 chip, which can, in a carefully designed circuit, out-perform many mid-priced console mic amps. A single rotary pot sets the gain of both the mic and line inputs, and a Line button is used for mic/line selection. Phantom power is switchable, and there's a phase reverse button and a switchable high-pass filter operating at 75Hz with a slope of 12dB/octave, but input metering is restricted to a single peak LED.

A balanced TRS jack handles the line input, though this can also be used unbalanced. A rear-panel push-button and a second unbalanced input jack provide an alternative DI input with a 500k Ω input impedance, suitable for use with electric guitars or basses. The output jack is normalised to the input of the expander and compressor section.

EXPANDER AND COMPRESSOR

In order to provide a simple means of cleaning up signals prior to compression, the MPX1 includes a fixed-ratio, variable-threshold expander with fixed attack and release times. The ratio of the expander is 2:1, a good compromise between smoothness of operation and effectiveness of noise reduction, and a single green LED shows when gain reduction is taking place.

The compressor is based not around the FET circuit used in some of LA's vintage-sounding designs, but around the THAT4301 VCA chip, a popular chip used in numerous compressors and console VCA automation systems. Rather than taking the soft-knee approach, the compressor is a conventional hard-ratio type with fully variable threshold and ratio controls. No attack and release pots are fitted, as the control is largely programme-dependent, but there are independent switch options for both fast and slow attack and release characteristics. A conventional make-up gain pot is fitted, and a readout of the gain reduction is provided by means of a six-section LED meter in the master section. Two further buttons provide bypass and a de-essing filter, the latter of which is switched into the side-chain to make the compressor more sensitive to sibilant sounds. The way in which the filter is

Voice channels are gaining in popularity with the rise of digital, providing an easy way of recording high-quality signals without having to go through a mixer. PAUL WHITE rates the latest in the breed.

pros & cons

LA AUDIO MPX1 £239

pros

- Creditable range of features for the price.
- The various sections sound good, and there's a full four bands of EQ.
- Separate input/output access to all sections.

cons

- Q pots are small and fiddly.
- Expander can be rather abrupt on some material.

summary

A well-designed, attractively priced unit that delivers sonic quality where it counts, at the expense of a couple of minor ergonomic flaws.

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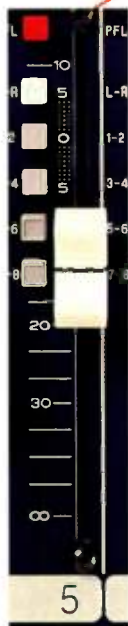
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► configured makes the compressor 8dB more sensitive to frequencies around 8kHz, which is where many sibilance problems occur. Though this isn't variable, it's a welcome addition and, if more precise filtering is required, it's always possible to patch the EQ section in via the side-chain send/receive jack. In addition to separate in, out and side-chain insert jacks, the compressor also has a Link jack, allowing two units to track stereo signals.

EQUALISER

Channel-type products often compromise on EQ, in order to get as many features as possible on the front panel, but LA Audio have stuck out for the full four bands. The high and low sections are fairly conventional shelving filters, providing up to 15dB of cut or boost at 12kHz and 80Hz respectively, while the two mid sections are fully parametric. The lower mid can be swept from 20Hz to 1kHz, while the upper mid goes from 500Hz to 20kHz, so there's no problem in reaching those awkward bass frequencies. The Q controls are basically splined pot shafts rather than proper knobs, presumably to save space, and they offer fully variable bandwidth, from three octaves to just one semitone. There's a small notch in the end of the 'knob' to act as a pointer, but if the MPX1 has an ergonomic weakness, this is probably it, as it's quite difficult to see. The EQ has its own Bypass button, though there's no status LED, and a further button brings in a 6dB shelving low-pass filter at 12kHz, to take out unwanted HF. This is switched separately to the EQ, and so may be used on its own if needed. This type of filter is useful in combination with HF-rolloff on the main EQ, to remove excess noise and fizz from DI'd guitar parts, though I'd have preferred to see a steeper curve used, ideally 12dB/octave or even more.

That leaves only the output stage, which provides a balanced drive to the output XLR, and an unbalanced, -10dBV output for connection to semi-pro equipment or computer soundcards. This section also houses the compressor gain reduction meter and an output level meter.

PERFORMANCE

Clearly the MPX1 is aimed at the cost-conscious end of the market, but the designers have really done their best to build in quality where it counts. For example, the preamp is better than you find on many mid-priced consoles, and it's useful to have the DI option as well as the more obvious mic and line inputs. Engaging the compressor also brings in the expander, so if you don't want to use that, you have to turn the threshold right down, but the compressor itself provides a happy medium between invisible compression and compression as an effect. Used in moderation, it smooths out variations in level, with very little sign that processing is taking place. However, at high ratios, with a lot of gain reduction, the effect becomes more obvious, especially when a fast release time is used. If anything, the compression

is more subtle than on some of LA Audio's more deliberately vintage-sounding FET designs, but in the context of this processor and the way it's likely to be used, that was probably a sensible decision. The expander is simple to use, but it can tend to chatter a bit in noisy environments, so you have to set it up carefully. Also, it's important to use a good mic stand for serious recording, preferably with a shockmount, as stand-borne vibrations can also trigger the expander if the threshold is set fairly low.

The equaliser is actually very competent, and you don't usually need much of it to knock a sound into shape. It's positive and clean, and, unless you over-use it, you don't end up with harsh highs or boomy lows. I also approve of the very wide sweep range, especially at the low end, where you can get right in amongst all those nasty, boxy frequencies and trim them out.

SUMMARY

Within its price range, the MPX1 performs well in all areas, making it a cost-effective solution to getting mic, line or instrument signals to tape or disk, with or without processing along the way. I like the flexibility of being able to separate all the different processing 'units', which is also good news if you want to use some of these sections while mixing, and though some corners have been cut, these are generally in areas you can live with. The Q pots and their invisible markers, for example, could be more friendly, and on a more expensive

“Channel-type products often compromise on EQ, but LA Audio have stuck out for the full four bands”

INSIDE STORY

Removing the MPX1's cover reveals a simple, one-board layout with all the controls and sockets connected directly to the double-sided, through-hole-plated PCB, to eliminate wiring. In fact, the only visible wire is a ground cable connecting the

main earth to the chassis. The general standard of construction is excellent, though the plastic-bodied XLRs don't appear to have their pin 1 (ground) connections bonded directly to the chassis at the nearest point, in accordance with AES grounding recommendations. The only obvious weakness I can

see in the design is that the use of normalised jacks to link the sections is prone to eventual problems from dirty or oxidised contacts, but at least they're easily accessible, should cleaning be required. It might be prudent to treat these with a contact enhancer or deoxidising solution when the unit is new.

unit more buttons would have had status LEDs. Judged purely on sound, though, I'd say that the only section I wasn't completely thrilled with was the expander, and even that's not bad for a simple, one-knob clean-up tool. On top of the obvious features, the compressor's de-essing option and the EQ section's 12kHz low-pass filter are genuinely useful bonuses, and the overall styling is tidy, with good engineering evident throughout. The voice-channel bandwagon is a crowded one, and different units generally offer different benefits, but as a good all-rounder that includes a flexible EQ section, the MPX1 has a lot going for it. **SOS**

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MultiStory

MULTI-EFFECTS EXPLAINED

PART 2: Modern multi-effects units provide all sorts of useful processors in addition to the more usual reverb and delay-based effects. PAUL WHITE discusses the extras you might find inside your effects box and how to best use them.

Last month, I covered the basics of the main effects that make up a typical multi-effects unit. However, most units these days also contain building blocks based on signal processors, such as mixers, equalisers, gates, compressors, exciters, speaker simulators, overdrive effects, and even swept resonant synth-style filters. As before, I'm going to quickly run through the key aspects of these basic processes, before moving onto the ways in which they can be combined.

MIXER MODULES

Mixer modules are included because a signal can generally be routed in many different ways within a multi-effects unit, through several combinations of effects blocks. Every time two effects block outputs have to be mixed together, or when a dry signal has to be mixed with the output of an effects block, a mixing element is needed. As far as the user is concerned, it's normally only necessary to adjust levels — the routing system automatically puts mixers wherever they are needed. When the output of one effects block is fed into the input of another, there will be no need for a mixer (series connection), but when the outputs from two parallel effects blocks need to be combined, a mixer will be required. Blocks may also incorporate mixing elements — for example, a delay block requires a mixer to balance the dry and delayed sound, as shown in Figure 1.



Figure 1: Delay block with wet/dry mixer.

Simpler multi-effects units may be limited to connecting the blocks in a series chain, and the simplest of these place the blocks in a preset order, leaving the user with choice of which blocks to use and which to turn off. More sophisticated systems allow the user to rearrange the blocks into a different order, and it's quite common for both series and parallel connection to be permitted. Figure 2 shows both series and parallel routing options.

EQUALISATION

There's no big mystery about equalisation, but it does come in several guises, specifically shelving, parametric and graphic. The familiar treble and bass controls provide both cut or boost at the extremes of the audio spectrum, and these tend to be based on shelving filters. The various EQ types were covered in more detail back in the February 1997 issue of SOS, so if you're not familiar with these terms, you might want to refer back to it. While a shelving equaliser is a 'broad strokes' kind of tool, parametric equalisers are far more precise devices that can be tuned to specific areas of the audio spectrum as narrow as a single semitone. A single parametric equaliser has three controls for cut/boost, frequency and bandwidth, where bandwidth determines how wide a band of frequencies is affected. A wide bandwidth (also known as a low Q) affects a wide range of frequencies, whereas a narrow bandwidth (high Q) affects a relatively narrow part of the spectrum. Setting up a parametric EQ properly takes a little experience, especially as most contain two or more separate equaliser sections, allowing you to EQ different parts of the audio spectrum at the same time.

Graphic equalisers are so called because the row of cut/boost sliders on the front panel gives an indication as to the shape of the unit's frequency response. The centre position is known as 'flat', because it produces a flat frequency response — that is, the sound passing through is not modified in any way. The more EQ sliders, the finer the control you have. Graphic equalisers have the advantage of simplicity, though you obviously lose the physical fader control if you're using the EQ within a multi-effects box. Even so, some units provide a graphic-style readout on the display so that you can still see the shape of the curve you've set up.

SWEEPED FILTER

The filter used in a typical analogue synth is closely related to the parametric equaliser, the main difference being that

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MULTI-EFFECTS EXPLAINED

- ▶ the frequency of the filter can be controlled electronically, rather than being left to the user. For example, an LFO could be used to sweep the frequency up and down, or an envelope could be generated to provide a filter sweep. You'll probably also find that the filter can be set to a higher Q. Some of the more sophisticated multi-effects processors include not only resonant synth-type filters, but also a variety of possible control sources, including envelopes derived from the input signal level, MIDI-triggered envelopes, LFOs and so on.

GATING

Noise gates were covered in depth in the September 1996 issue of *SOS*, but, to cut a long story short, they are little more than electronic switches that mute the audio path when the input signal falls below a threshold set by the user. If you set the threshold at just about the background noise level, any pauses or gaps in the programme material can be silenced. While the gate is open, both the wanted signal and the noise pass through, but unless something is seriously wrong with your source material, the wanted sound will be loud enough to hide the noise.

Gates have additional parameters that set how fast they open and close. Simpler versions may

COMPRESSION

Essentially, a compressor monitors the level of the incoming signal and turns it down when it looks like getting too loud. Signals below a user-adjustable threshold pass through unaffected, but signals exceeding the threshold are reduced in level by an amount determined by the Ratio control. The Ratio control sets the number of dBs of change in output level that will occur for a given change in input level, so a ratio of 2:1 means that an input-level increase of 2dB will only cause a 1dB increase in the output level. At very high ratios, the compressor behaves as a limiter — once the signal level reaches the threshold, it is 'limited' from going beyond it.

An attack control is used to govern the rate at which the compressor responds once a signal has exceeded the threshold, while the release control sets how long the gain takes to come back to normal after the signal has fallen back below the threshold.

The most popular use of dedicated compressors is to control vocal, drum or bass levels, though in the context of a multi-effects unit they may also be used to add sustain to guitars, to re-shape the decay characteristics of a reverb decay, or to compress

the input of, or output to, one of the other effects blocks. In other words, the compressor is more likely to be used in a creative rather than corrective mode in a multi-effects environment. Because compressors increase the level of programme noise during quiet passages, they are often used in conjunction with a gate. As a rule, the gate goes before the compressor.

DUCKING

Ducking is a technique for using a compressor to control the level of one signal with the level of another signal — for example, the radio DJ's voice that causes the background music to 'duck' in level every time he speaks. Some multi-effects boxes now include ducking delay and ducking reverb algorithms, the idea being that when the playing is busy, the effect remains at a low level so as not to get in the way. However, when there's a pause the effect swells up to its

full level. The user generally has control over the degree of ducking that takes place. In some multi-effects units, ducking is provided within some delay and reverb algorithms so that the effect is more predominant during pauses and is reduced in level when the material is busy. This can help keep a mix uncluttered, while still creating the illusion that heavy effects processing is being used.

ENHANCERS

There are several types of enhancer on the market today, but most tend to create a sense of brightness and transparency by manipulating the

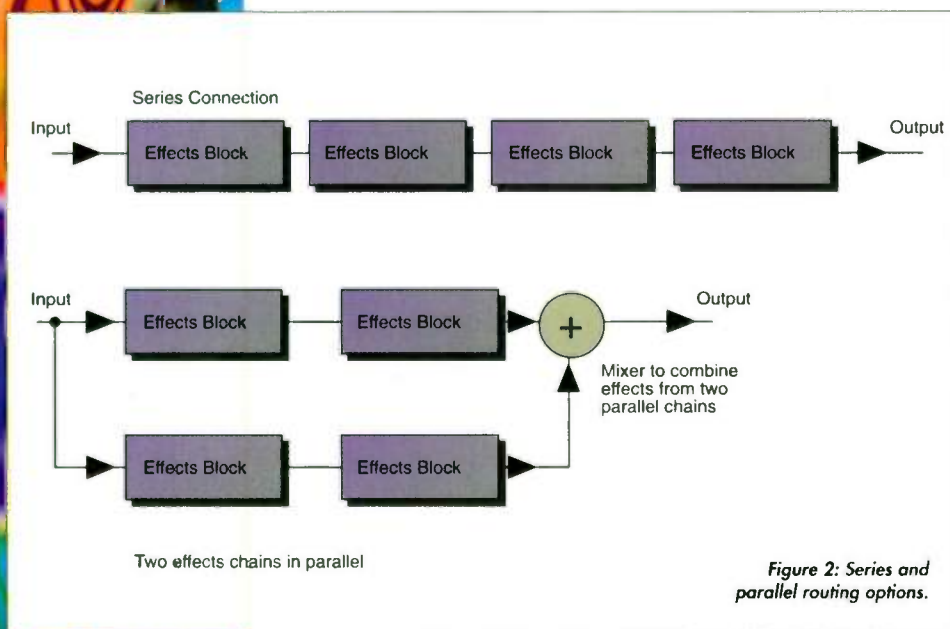


Figure 2: Series and parallel routing options.

dispense with the attack time, or make it automatic, but the release time needs to be adjustable to ensure that slowly decaying sounds, such as reverb tails, are not cut off early.

Though not a complete solution to noise, gates can be useful when working with electric guitars, which often generate a lot of hiss and hum, especially when overdrive is being used. They are also used to keep pauses in vocal tracks clean. In the context of a multi-effects unit, you could even gate the input signal to reduce the effects of mix buss noise, gate reverb to create a gated reverb effect, or simply to ensure that the song starts cleanly.

high-frequency end of the spectrum. The Apex principle synthesizes new upper harmonics, while other manufacturers use dynamic EQ to add top boost during transient sounds. The results can be remarkable, but it is easy to over-use any type of enhancer, in which case an aggressively bright sound may result.

Within a multi-effects unit, enhancers may be used to brighten individual instruments or, if the routing will permit it, they may be placed after another effects block to brighten only one component of the sound — for example, the output from a reverb or delay.

AMP/SPEAKER SIMULATORS

While keyboards tend to work best through a hi-fi type of system with a flat frequency response and minimal distortion, guitar and bass amplifiers are 'voiced', which means that their frequency response is shaped to suit the instrument rather than being left flat. Furthermore, the loudspeakers and enclosures used in guitar and bass amplification tend to have a very limited frequency response, which enables them to filter out the rougher-sounding components of amplifier distortion. If you were to DI (Direct Inject) a distorted guitar without EQ, the result would be very thin and raspy compared to what you would

hear from an amplifier. To make DI'ing the guitar a more practical proposition, the amp/speaker simulator was devised. This is a filter circuit that mimics the amplifier and loudspeaker voicing of a typical guitar amplifier. Many multi-effects units now include amp/speaker simulators as well as overdrive, which enables the user to create a fully produced guitar sound within one unit. The output may then be recorded without further processing. In addition to creating authentic miked guitar amp sounds, amp/speaker simulators are also useful for warming up digital synths where a fatter, more 'analogue' sound is desired.

OVERDRIVE

The overdrive sound of electric guitar amplifiers is so complicated that some designers are now resorting to physical modelling as a means of replicating it digitally. However, even without physical modelling, it is possible to produce a digital equivalent of an overdrive pedal, and that's what many multi-effects boxes give you. Serious guitarists may still want to use their own analogue distortion pedals before the multi-effects box, and that's fine, but digital overdrive can also be used to great effect on organ and pad sounds if it is used in moderation. Drum sounds and loops may also be 'crunched' up in interesting ways.



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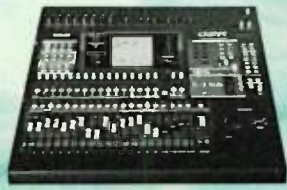


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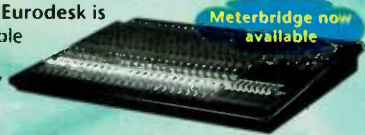
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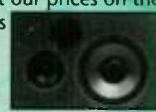
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SONY PCMR500

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HUGH ROBJOHNS
studio-tests a new, moderately priced professional DAT from Sony.

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Sony seem to be producing a new DAT machine almost every month, and now have an extensive collection to meet every possible requirement, from Walkman models to all-encompassing professional monsters.

The PCMR500 reviewed here sits midway between those extremes and, together with its four-headed sibling, the R700, has been designed to meet the specific needs of the low-end professional market. Both machines feature the familiar four-motor, direct-drive transport mechanism, switchable Super Bit Mapping A-D conversion [for an explanation of Super Bit Mapping, see the review of the Sony DTCA9 DAT recorder in the June 1997 issue of *SOS*], and sampling at 48kHz or 44.1kHz (or at 32kHz in the long-play mode).

The R500 is designed for rack use (rackmount bolts are even supplied), and is equipped with both balanced XLRs and unbalanced phono connectors for inputs and outputs. Digital interfacing is via AES/EBU and the IEC958 domestic format. An infrared remote control is supplied, and there are also provisions for serial and parallel wired remotes (the serial is not the universal Sony P2 9-pin protocol, unfortunately, but a bespoke 3.5mm mini-jack connection).

HARDWARE

Although the PCMR500 incorporates permanent rackmount ears as part of the front panel, it also has feet for desktop use. However, if the feet are removed the unit will fit neatly into a 3U slot.

The rear panel is clearly laid out and, on the left-hand side, has two pairs of XLRs for the balanced inputs and outputs. Above each connector, independent level controls allow matching of operating levels to a house standard. The factory calibration aligns input and output signals of +4dBu with -20dBfs on the DAT machine (ie. puts the peak level at +24dBu), but the level adjusters allow the sensitivity to be increased to put 0dBfs peak level at +8dBu. This seems to be a

very practical working range and should cater for every professional requirement.

In the centre of the rear panel, a clutch of phono connectors provides unbalanced inputs and outputs. The outputs are active at all times, as are the balanced outputs, but the inputs have to be selected via a front-panel toggle switch.

Below these analogue connectors, another pair of phono sockets carries the co-axial IEC958 digital data in and out. The R500 supports both the widely adopted domestic S/PDIF data format, and also the much rarer 'Broadcast' data format which can be found on Sony's PCM2300 and 2700 DAT machines. A small slide switch adjacent to these sockets selects the input between IEC958 and AES/EBU (the AES/EBU XLR interfaces being just to the right of the phono connectors). Again, as with the analogue outputs, both flavours of digital output are available simultaneously.

On the right-hand side of the rear panel there's an IEC mains socket (no mains or DC fuses are accessible from outside the unit) and two remote control sockets. The first of these is an 8-pin DIN socket for a parallel remote, and the second is a 3.5mm mini-jack socket for the special serial remote, which requires the optional RMD750 'commander'. The parallel control can be configured in one of two ways: either as a totally 'safe' Stop/Play/Rewind/Wind combination (with provision for fader-start), or as a Stop/Write-ID/Play/Pause/Record combination. A front-panel switch activates the remote control operations and selects between no remote control at all, the infra-red system only, or both wired systems.

The front panel is very intuitive and should not present any problems to seasoned DAT machine users. Below the chunky guarded power switch on the left-hand side is a three-position toggle switch which determines the remote control operation, and below that is a headphone socket and level control.

The tape transport cover looks rather like a drawer, but is actually hinged at the bottom, and the tape is presented at a slight angle, like most other Sony DAT machines. Below the tape drawer are two blocks of square push-buttons. The set on the left are concerned with the writing, erasing, re-numbering and rehearsing of Start and Skip ID

pros & cons

SONY PCMR500 £1169

pros

- Stunningly intuitive to operate.
- Very good sound quality, plus SBM implementation.
- Flexible analogue and digital interfacing.

cons

- Needs an optional remote for End-ID operation.
- Live Shuttle wheel could cause embarrassment.
- Lots of very strong competition, most of which is cheaper!

summary

A simple to use DAT machine, optimised for the broadcast and budget-conscious professional markets. Good range of facilities and customisation potential.

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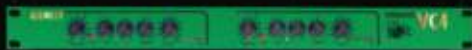
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WDR

SONY PCMR500

- ▶ functions, and those on the right deal with marking and locating to a specific A-time point on the tape, activating the Skip-play function (the machine will fast-wind to the next Start ID following a detected Skip ID), and initiating the Repeat-play mode, where either the current track

option. Below these, a pair of rotary knobs set the analogue input level and have a strong detent at the 12 o'clock position to mark the factory-calibrated input sensitivity.

SETUP MENU

Like much Sony equipment these days, the R500's operation can be customised via a series of setup menus. The menu mode is accessed by pressing the Menu button and then using the Shuttle part of the wheel to find the required menu function (there are 17 options on the R500 and 19 on the R700).

Two menu items allow the Copy-ID status recorded on the tape to be observed or determined. The options are copying permitted (default), copying prohibited, or one generation copy only (SCMS mode). Other menus set the record mute duration (0.5 up to 9.5 seconds), the level threshold needed to activate the automatic Start ID mode (from -12 to -60dBfs), and how long the signal must have remained below the threshold before the Start ID will be written. There are a number of menu pages concerned with setting the date and clock displays, date order (American or European formats), 12- or 24-hour clock format, and whether to include the time displays in the display cycle. Three menus are concerned with the detection of Start-ID data in the IEC and AES/EBU digital data streams from external digital sources. Start or Skip IDs from DAT machines or the Q-subcode from CD players can be detected and translated into Start IDs on the new recording, when connected via the IEC958 digital interface. A third mode looks for Start or Skip IDs on the AES/EBU interface in a similar manner.

The first ID number written on the tape when recording IDs or re-numbering can be set in another menu, and there is a facility to create a blank lead-in area at the start of new tapes automatically, with a user-selectable sample rate. The final menu displays the number of hours that the rotary-head drum has been operating.

REMOTE CONTROL

The remote control 'commander' supplied with the R500 is an infra-red type called the RMD757. It's a slimline unit with three columns of buttons providing all the usual transport functions, including Start ID searching and direct ID number access.

However, the optional RMD750 commander is an altogether more elaborate affair, which can be used either as an infra-red system or as a wired remote using the serial mini-jack connector. In either operational mode, this remote performs a number of functions that are not directly accessible from the machine's own front panel, and under certain circumstances it would be a rather handy tool.

The RMD757 remote control.



“The PCMR500 is a joy to use.”

or all tracks (depending on the selected mode) will be repeated up to five times.

The centre portion of the control panel is raised above its surround and houses the display module, transport controls and shuttle/data wheel. All the expected transport functions are here, including record mute and ID searches. A pair of small push-buttons next to the data wheel call up the menu display and store the selected parameters. The wheel itself is a two-part design where the outer ring acts as the Shuttle control or alters the menu parameters, and the inner part dials through the menu list. The Shuttle wheel is permanently 'live', so that nudging the wheel when playing instantly shuttles the tape in the appropriate direction. Whilst this is useful, it is also potentially dangerous in a broadcast situation!

Above the wheel, three small push buttons reset the margin (headroom) display, zero the tape counter and cycle through the display modes. The last include A-time, track-time, remaining tape time and the tape-time counter. If selected on a menu page, a host of current and recorded date and time functions can also be included in the cycle.

The display itself is a very clear dot-matrix fluorescent type, with a fast-acting stereo bargraph meter calibrated down to -60dBfs and an automatic peak hold. The time, program number and margin displays are all very readable, even from the far end of a control room, and only the sample-rate flags are a little on the small side.

To the right of the display section, four toggle switches select analogue or digital input; unbalanced or balanced analogue source; standard or long-play recording mode (the former with a choice of 48kHz or 44.1kHz sampling); and the Super Bit Mapping



The RMD750 allows the user to program a specific selection of tracks in a particular replay order (the so-called 'Random Music Sensor' or RMS mode). There is also a music scan function which plays the first eight seconds following each Start ID, and the unit can also activate the writing or erasing of End IDs (including a rehearsal mode to ensure that it is accurately positioned).


OPERATION

The PCMR500 is a joy to use. The transport is a little clunky when switching between pause and play, perhaps, but is otherwise very quiet and fast. Operation is total simplicity, and only the menu modes will make you reach for the manual, to help decipher the cryptic messages and parameters.

The inclusion of the direct-acting shuttle wheel is excellent if you want to be able to re-cue the tape quickly, but could be a liability in a live replay environment — I would have liked to see a menu mode to disable it. The adjustable analogue input and output trimmers are worthwhile, and make matching operating levels very straightforward.

I was disappointed to find that End ID writing and searches could only be performed with the optional RMD750 remote control unit. I would personally have preferred to have End ID facilities on the front panel in place of the Skip IDs.

From an audio quality standpoint, the R500 is a very fine-sounding machine, and the Super Bit Mapping system can extend the dynamic range beyond the theoretical limits of 16-bit quantisation, should you feel the need! Certainly the converters performed very well indeed, and direct comparisons with a high-quality CD source were very favourable.

On the whole, this is another strong machine in the Sony DAT fleet, though it falls in with very strong competition from the likes of the Panasonic SV3800, the Fostex D15 and the Tascam DA30, and even faces a stiff challenge from its own semi-pro sibling, the DTCA9, which costs significantly less. The R500 has many strengths and only a few weaknesses, but, as always, you should weigh those carefully against the price and facilities offered by similar machines from other manufacturers. 

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Write ^{The} Stuff

HHB CDR800 CD RECORDER

PAUL WHITE gets a feel for the one-off CD business using HHB's new stand-alone CD recorder.

When HHB unveiled their CDR800 stand-alone CD recorder at a trade show in Germany earlier this year, it attracted a huge amount of interest from all sectors of the studio market, not least because of its attractive price. With quantity prices of blank CD-R discs running at under £3.50, the whole concept of producing your own short-run CDs, or CD masters for commercial duplication, is very attractive. But why is everyone so excited about this machine? After all, for less than half the price, you can buy a CD-ROM burner for your Mac or PC that will not only let you write disks in a quarter of the time, it will also allow you to back up audio files, archive entire hard drives and create your own CD-ROMs. The answer is that the CDR800 offers simplicity, and it doesn't tie up your computer. What's more, if you're making copies directly from a DAT master,

you're restricted to real-time operation anyway.

To create a CD, all you need is a DAT tape with track IDs placed where you want the CD tracks to be. In real time, the DAT tape is then digitally cloned to a CD-R blank, and when this is done, you have a CD that can be played on a regular CD player or even used as a master for CD mass production. Of course you can also record from other digital sources, such as MiniDisc, DCC or digital workstations, but for media that don't include embedded track numbering, track IDs will have to be entered manually unless there's a sufficient gap between tracks for the auto system to work. This being the case, perhaps the user would have benefited from being able to change the CDR800's preset 10-second silence recognition time? Track ID entries must be made during recording — it's not possible to add them once the recording is done. The auto level detect system is factory-set to recognise passages

below -60dB as silence, but this may be reset anywhere from -40dB to -80dB in 10dB steps, or switched off altogether.

Physically, the CDR800 is not unlike a regular rackmounted CD or DAT machine, and can accept both analogue and digital inputs in a number of formats. The analogue input is available on both balanced XLRs (switchable from +4dBu to -8dBu) and unbalanced phones; the digital input stage offers a choice of AES/EBU, S/PDIF or optical. The output is on unbalanced phonos, S/PDIF and optical. There's also a DIN socket for a parallel remote, and the manual thoughtfully includes wiring details for connection to hard-wired remote transport buttons, such as might be built into an edit suite.

When used with an analogue input, the CDR800 employs a single-bit conversion system for maximum low-level linearity. The digital input includes a sample-rate converter, so that you don't get fooled by mixed-sample-rate DAT tapes or tapes made on domestic 48kHz machines. The incoming digital system is passed through to the digital output without sample-rate conversion. A three-beam pickup with a differential push-pull system is used for reading discs — the CDR800 also functions as a player — and the overall design approach is claimed to minimise cross-interference from signals within the machine, which many experts now believe is the underlying reason that numerically identical CDs can sound different when played on the same machine. For example, if the pickup servo system were to modulate the power supply, and that modulation were to find its way into the audio circuitry, an increase in distortion would result, and if some mechanical imperfection made the servo work harder, the affect on the sound would be more significant, even though the actual numbers recorded on the disk were identical.

Mechanical stability is also important for accurate recording and playback, and the CDR800 features a stable platter mechanism that supports the entire surface of the disc from below. When you open the disc drawer, the disc turntable comes out with it. This means you have to insert the disc label side down but, as the optics can be suspended above the disc, there's less risk of dirt accumulating on the lenses. There are also four chunky, non-slip feet on the bottom of the unit for free-standing use.

An infra-red remote control is supplied with production models (although no remote was included with the review unit), and the usual stereo phono cables are also provided.

DISC WORLD

Current CD-R blanks can record up to 74 minutes of audio and, in order for a recorded disc to be playable on a domestic CD player, it needs to contain not only the required audio material, but also a table of contents that tells the player where the tracks are, when they start and so on. CD-Rs may be recorded in multiple sessions or all in one go, but they can't be played until the disc is 'finalised', a process that creates the table of contents and prevents further recording. Before it's finalised, the disc can be replayed only on the CDR800. If the disc currently in the machine hasn't been finalised, an icon in the display window lights to let you know that further recording is possible.

The control system is more straightforward even than that of a DAT machine, though there are many similarities, including a multi-function time display that may be switched to show elapsed recording time, total recording time or remaining recording time. Also included in the display window are twin-peak recording-

PROTECT & SERVE

Copy protection was a big issue when DAT first came on the scene, and consumer machines still have SCMS (Serial Copy Management System) built in (which inconveniences everyone except the actual pirates, who can afford pro machines without SCMSI).

CDs have their own copy protection system, and the CDR800, via rear-panel DIP switches, enables three types of disc to be produced — those that have no restrictions upon copying (copy bit 1), those that can be copied once (copy bit 0), and those that can't be copied at all (copy bit 1/0).

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Francis Buckley EQ Magazine July 1996

"The Event 20/20's turned out to be damn fine monitors, well up to the task of serious mixing, editing or post-pro work."

"The 20/20's bass end is sufficiently extended to make them useful as the sole pair of monitors in a small studio."

"There's plenty of top end clarity without any tendency to fatigue, and the stereo imaging is excellent."

Paul White SOS July 1996

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Nigel Lord The MIX January 1997



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HHB CDR800

pros & cons

HHB CDR800 £1526

pros

- Affordable.
- Simple to use.
- Produces Red Book, PQ-encoded master discs.
- Good range of I/O facilities.

cons

- Auto ID numbering and end-of-recording detection a little inflexible.

summary

An affordable stand-alone solution to short-run or one-off CD production, which doesn't require the use of a computer or difficult-to-learn software.

SOUND ON SOUND

“The CDR800 offers simplicity, and it doesn't tie up your computer.”

▶ level meters, a sample-rate readout that monitors the incoming digital signal, and a readout of the recording source selection. As on a DAT machine, skip IDs can be written to direct the player to skip certain tracks, but of course any ID changes have to be made before finalising — once that's done, your disc is strictly read-only.

RECORDING MODES

There are five possible recording modes, the first of which is Automatic Digital Source Synchro Recording (one track). As the name implies, this mode allows you to record one track at a time — the recording starts as soon as the source plays, and stops automatically at the end of the track. Recording starts when a sound is detected (the threshold has several user-definable options), and finishes either when a second track is detected, when a silence of longer than 10 seconds is detected, or when the Stop button is pressed. The process is started by pressing the Digital Synchro button to 'arm' the recording process, after which the source material is started.

Modes two and three are both Automatic Digital Source Synchro Recording (all tracks), but mode two is used when the source isn't DAT, or when the automatic transfer of DAT IDs to track IDs is not required. Mode three (DAT Exclusive) is the most useful if you want to transfer a compiled DAT to CD in one take. Press the Digital Synchro button until ID Sync is displayed, and DAT IDs are transferred directly to the recorder for use as track IDs. Note that the AES/EBU interface doesn't carry this information, so you must use either S/PDIF or optical connections. Once again, recording continues until a pause of greater than 10 seconds is detected or until the source is stopped.

Mode four is Manual Digital Source Recording and is used mainly for recording from less common digital sources. The main difference here is that recording is started and stopped manually rather than automatically. Finally, there's the Analogue Source mode, which is used when you're recording any analogue source material into the CDR800.

Once your recording is complete, pressing the Finalise button writes the table of contents and makes the disc playable on a regular CD player. This takes several minutes, during which time the machine should be left to get on with its job uninterrupted. There is a Resume function, which attempts to salvage a finalisation that's been interrupted by a mains failure, but the manual warns that this doesn't always succeed.

Other user-friendly functions include the ability to create fade-ins and fade-outs during recording, and to record blank spaces or blank tracks. To enter track IDs manually when recording, you must press the Manual button on the front panel at the appropriate time. If you mess up a track, you can write a skip ID to have the player skip it, providing you do this before finalising. In Play mode, the CDR800 can offer all the programmed play functions you'd expect to find on a commercial player. Of course, if I had one of these, the last thing I'd do is wear it out using it as a player!

IN USE

Recording a CD from a DAT on which the track IDs have been properly placed is extremely easy; simply press the Source button until DAT shows up, then press the Digital Synchro button until Auto ID is in the display window. At this point, the DAT tape can be started and the recording starts when the first track start ID is read. There's no ID offset facility built into the CDR800, so it's advisable to move the DAT IDs back slightly to prevent the risk of a song with a quiet start being indexed late.

Once the recording is complete, the recording process stops after 30 seconds of silence, but there seems to be no way to make it stop right at the end of the last track: the CDR800 doesn't seem to recognise DAT End markers or even the end of the recorded subcode. I see this as quite a limitation, because, if you want to produce a CD master for production, you don't want 30 seconds of blank at the end of it, and you certainly don't want to have to hover over the machine while it's recording just so you can press Stop at the appropriate point.

Before the disc is finalised, the recording conforms to Orange Book standard, which means it can't be replayed on a conventional CD player. Pressing Finalise, followed by Pause, takes around four minutes to create the table of contents necessary to convert the disc into a Red-Book-standard, PQ-encoded disc that can be played on regular CD machines and used as a master for CD duplication.

SUMMARY

The CDR800 is certainly one of the most cost-effective stand-alone CD burners around, and the fact that the PQ-encoded discs can be used for CD production cuts out an expensive pre-mastering stage. I like the ease of use of the machine, and certainly have no complaints about the number of I/O formats supported, but I feel that the auto track ID system could have been made a little more flexible, especially in recognising the end of a recording. The whole point of a machine like this should be that you can let it get on with making a copy while you do something else, but the fixed 30 seconds' silence before the CDR800 stops at the end of a tape means that you have to be on the ball to press the Stop button manually. Other than that, there's little not to like about the CDR800, and I foresee both professional and private studio owners buying them in large numbers to produce their own limited-run CDs or CD masters. **SOS**

£ £1526.33 including VAT.

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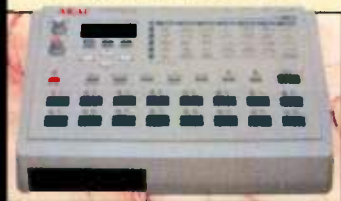


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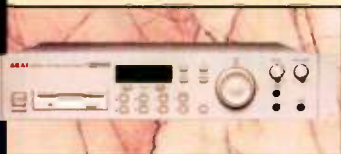


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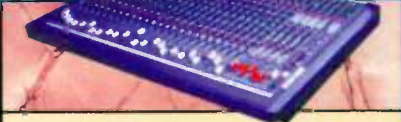
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Synth School

PART 2: RESONANCE, ENVELOPES & ROUTING

This month, PAUL WIFFEN looks at ways of modifying a filter's shape, both in terms of frequency response and over time, and considers the importance of routing in connecting together a synth's various sound-generating and -modifying components.



Having established the basic principle of analogue (or 'subtractive') synthesis in the first part of this series, back in June's issue — ie. start with a sound containing more than you need (a waveform which contains lots of harmonics) and whittle it down (using a filter to remove the unwanted harmonics) — we can now come on to ways of refining this process and automating it. If you have been trying the manual filter frequency manipulations I suggested at the end of the first piece, you will have noticed that

accentuate a small filter movement than to make the movement itself bigger.

A GREATER EMPHASIS

This is done by amplifying the frequencies around the cutoff point. This means that instead of having to detect the filter's position by noticing what is *not* there, we can actually hear more of the frequencies around the cutoff point because their presence is exaggerated. There are perhaps more synonyms for this feature of analogue synthesis than any other, and this can make it difficult for beginners. If the terminology for this parameter on the front panels of two synths is different, how are you supposed to know they both do the same thing? The most self-explanatory of the terms used is Emphasis, which probably explains why it is the least common. All too often, manufacturers try to mystify the processes they use, so more scientific terms, like Resonance and Q, are much more common. But whether the control is labelled Emphasis, Resonance, or Q, it does the same thing. At the point where the filter cutoff slope begins, there is a very narrow band in which the frequencies are actually boosted. The higher this control level is

set, the more the frequencies at the cutoff point are amplified (see Figure 1). When the filter is static (ie. the cutoff point is not moving), the effect can sometimes be difficult to spot, possibly because there are few frequencies in the filtered waveform around the cutoff point. Sometimes, when you turn the resonance up on a static filter you hear it quite clearly (because there are frequencies around the cutoff point and they are being boosted), other times not. But the surest way to hear the effect of resonance on a filter is to sweep it, even by a small amount. If you have access to a filter with resonance, select a sawtooth wave (or some other harmonically-rich source if you don't have analogue waveforms available) and try adjusting the resonance on a static filter setting first. If you don't immediately hear certain frequencies being picked out, just move the cutoff a little bit. Then

do the same with the resonance set to zero. The difference will be very clear. As the filter with resonance is moved, the individual harmonic components in the source waveform(s) will be picked out one by one. This, for me, is another one of the great joys of analogue synthesis. Quite often, the sonic interest created by this slow sweep through

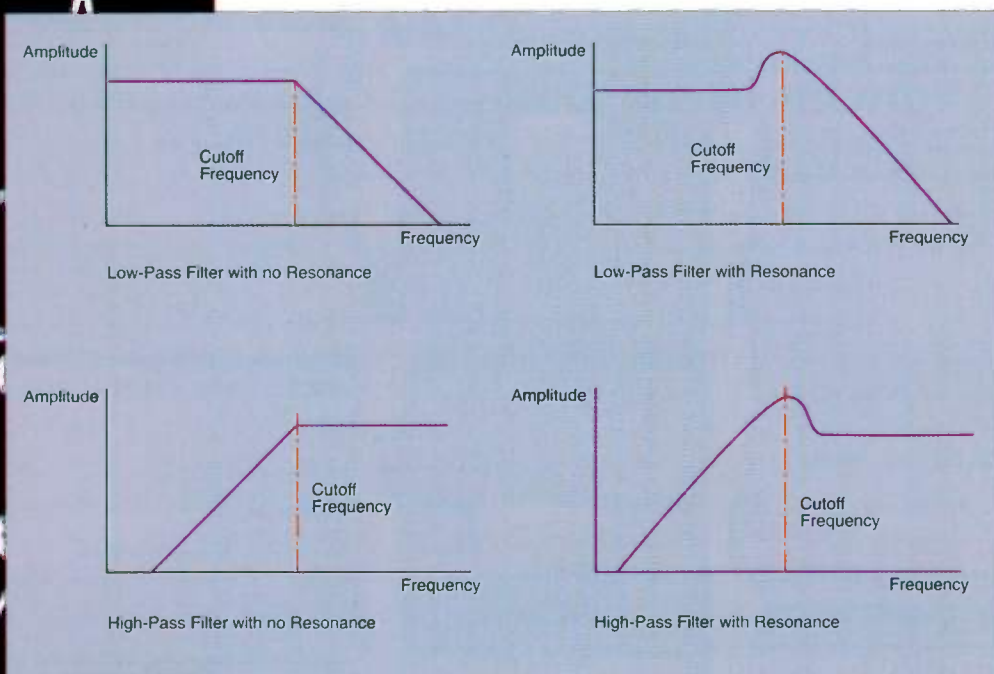


Figure 1: the effect of resonance on volume at different frequencies in high-pass and low-pass filters.

small movements of the filter cutoff are not that noticeable, and that to get a marked effect you need to sweep the filter over a sizeable portion of its range. Although later on in this installment we will look at ways to do this automatically, without spraining your wrist every time you move the knob quickly, it is sometimes more appropriate to

the frequencies on a single note is worth a thousand played notes with unvarying harmonic content, especially if you sweep in a low register, where all the associated harmonics are within the audible range. The most common use of resonance is with low-pass filters, but on synths with high-pass and even band-pass filters (see June's instalment for more on these), you usually find that the resonance control is still available, and sometimes it can be very effective when used with such filters, especially for creating 'vocal'-type movement in a sound (see the 'Vowel Play' box).

Of course, resonance has many other uses. You can use it whenever you want a sound to catch the ear in a busy mix, where it has to fight its way past a lot of other attention-grabbing sounds. It is also useful to alert the ear to the presence of basslines, when you know (or suspect) that the music is going to be heard on systems that cannot accurately reproduce the bass end (AM radio, older TV sets, and so on). A bit of resonance will bring out the higher harmonics which are in the bandwidth of the playback system, and listeners' ears will extrapolate to the fundamental and 'fill in' the missing frequencies.

FILTERS AS OSCILLATORS

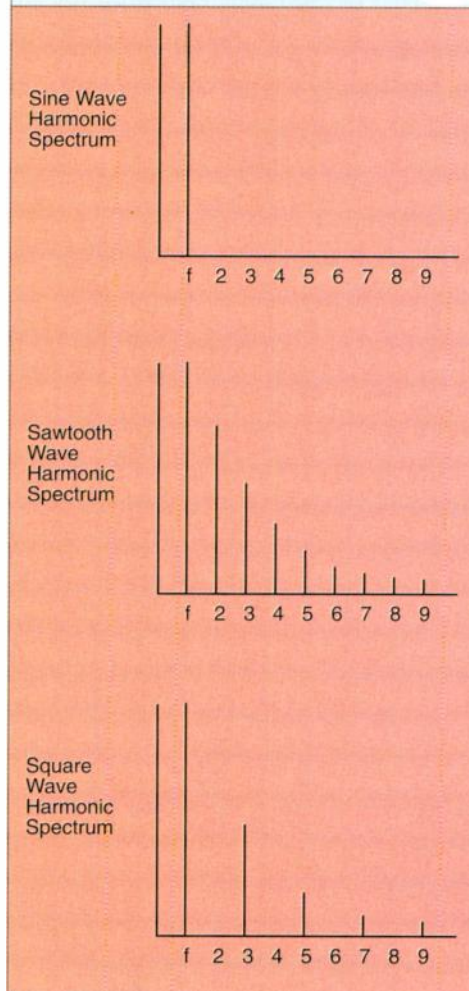
On some analogue synths, if you turn the resonance right up, the filter starts to howl in a way that is very similar to guitar feedback. This is known as 'going into oscillation' and happens because the resonance is up so high that a clearly distinguishable frequency is created, with the harmonic characteristics of a sine wave (ie. very little else except the fundamental pitch). Sadly, some analogue manufacturers and many of those currently producing PCM-based synths felt/feel that you need to be protected from this extreme effect, so you may find that you can't get this to happen on your synth. If you can, try using full resonance with the audio oscillators set to generate white noise (if available on your synth). This is the extreme example of subtractive synthesis I referred to in the first part of this series, where you start with all frequencies present, but hack most of them away, until you are left with just a raw oscillation of a very narrow band, amplified to screaming level. You can then use the filter frequency as a sort of very rough pitch control. While it is unlikely that you will find a use for this technique in a sensitive ballad, sometimes it is just the thing for the climax to a full-frontal sonic assault. This technique will really make ears bleed, and also offers the synthesist one of the few ways with which to fight a guitarist stuck in front of a Marshall stack with all six strings feeding back (you can hear Brian Eno making excellent use of the technique on Roxy Music's early, well, music). I've not heard self-oscillation being used in techno yet, but I'm sure it would fit right in with that 'machinery on overload' vibe.

INTRODUCING ENVELOPES

In the course of discussing the effect of resonance, we've seen that it brings out movement in the filter cutoff. So far, we have assumed that this movement will be induced manually by the performer... and so it often is. For me, the difference between a great player and a greater synthesist is that the latter

ERRATUM

Apologies go to readers for the mistake which crept into the diagrams illustrating Paul Wiffen's first article in the Synth School series, and our thanks to those four observant readers who contacted us to point it out. The fundamental frequency in any waveform is of course the same as the first harmonic in the harmonic series, and should not have been illustrated as two separate components. The correct harmonic series for the sine, sawtooth, square and pulse waveforms are displayed left.



often does more with the parameter knobs during a solo than with the keyboard. Listen to Larry Fast with Peter Gabriel or the aforementioned Brian Eno on early Roxy Music albums and you won't hear a bewildering flurry of notes, but complex changes in timbre which are far more interesting than 'chops'. However, there are many filter movements which are too fast to be produced for every note played. Wouldn't it be nice if there were a way to automate these filter movements, leaving both hands free to play the keyboard? Well, the good news is that there are several. We already saw one of them in last month's instalment; the Low Frequency Oscillator, or LFO, which can be used to induce regular repeated variations in the sound. The first applications we saw were in using the LFO to control pitch, adding vibrato or volume for a tremolo effect. By routing the LFO to the filter cutoff frequency (more on the concept of routing in a minute), you can constantly vary the harmonic content of the sound, an effect which is particularly pleasing at very slow LFO frequencies. If you then also increase the resonance, the harmonics will be emphasised in turn as the cutoff sweeps back and forth.

There is another way to vary the cutoff, which is based not on repeated effects, but happens

“For me, the difference between a great player and a greater synthesist is that the latter often does more with the parameter knobs during a solo than with the keyboard.”



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► automatically each time you trigger a note. This means you can set up the same shape of filter movement for each note, even when you are playing very quickly or polyphonically. This sound-shaper is not only the lynch-pin of analogue synthesis, but a mainstay of all other types of synthesis as well, and is called an Envelope. It allows us to automatically shape sound over time, beginning from the start of each new note. By taking care of the changes we require on every note we play, it leaves us free to worry about what we are playing. I've introduced the concept here by explaining how envelopes can alter filter

cutoff over time, but they may also be used to control any other aspect of the sound which we want to affect each note played, such as the volume level or pitch. This is what makes the envelope such a universally useful synthesis tool, not just for analogue filtering, but for overall volume (which we need to control in any type of synthesis). The envelope is also important in other synthesis methods, for controlling frequency modulation (or FM) amount or the level of different harmonic groups in FM or additive synthesis respectively (more on FM and additive synthesis next month).

ANALOGUE RECREATIONS WITH PHYSICAL MODELLING

Although many people swear by the original analogue synths, some of which are now changing hands for more than their original retail prices, a new generation of synths is recreating the analogue sound via the state-of-the-art technique of physical modelling. Using raw processing power, DSP chips (first used for effects processing) are now being used to simulate the exact stages of the sound modification procedure which occur in analogue synthesizers, from oscillator waveforms to filter action to envelope shaping, all entirely in the digital domain. The principle advantages of these modern recreations are that they boast rock-solid tuning (never original analogue's strong point),

hundreds of presets and user programs, and all the advantages of MIDI for sequencing and SysEx communication. Korg's Prophecy did not restrict itself to just analogue sounds but the analogue models it did feature were extremely reminiscent of the classic monosynths of yesteryear. The first polyphonic synth to recreate analogue sounds was Clavia's Nord Lead, which allowed real-time control with dedicated analogue controls, and this machine had the market to itself for over a year (and was recently upgraded to the Nord Lead II). However, the Japanese manufacturers have responded strongly in the last few months, with Roland's JP8000 (a thorough recreation of that

company's classic Jupiter 8) coming first. This was swiftly followed by Yamaha's AN1x, a 10-voice synth with particularly good sync sounds — see the AN1x review starting on page 166 of this issue. You can also read Gordon Reid's preview of the very latest contender, the 12-voice polyphonic Korg Z1, elsewhere in this issue (see page 46). Whether any or all of these machines can be seen as authentic replacements for the classic synths of yesteryear is a personal opinion, and no doubt the debate on this point will rage long and hard. What is beyond question is that as the second-hand market runs out of bargains (as owners wise up to the value of the pearls they have been sitting on), these new machines offer a very viable alternative, particularly in the modern MIDI setup.

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The most common type of envelope in traditional analogue synthesizers is called the ADSR. This is an abbreviation for the four stages the envelope can pass through, namely Attack, Decay, Sustain & Release (see Figure 2). While these are not universally implemented by any means (on cheaper machines you may find only Attack, Decay and Release, and on more recent synths there may be additional parameters available), the ADSR is the most common type, and a good place to start understanding the idea behind envelopes. Three of the four standard envelope parameters refer to the times taken to move between specific levels (Attack, Decay and Release). The third parameter, Sustain, is different, as this sets the level at which the envelope remains until the key is released.

Attack is the time taken for the envelope to move from the initial zero level to the maximum level. The higher this parameter is set, the longer it takes to reach that maximum level; so if the Attack Time is at zero, the full level should be achieved instantly (in fact, it does take a small amount of time to reach full level, and this time varies from synth to synth; this variation in the minimum attack time is what can make one synth sound punchier than another). The Decay parameter sets how long it takes for the envelope level to drop from the maximum to the variable Sustain level. If this Sustain

level is set to maximum, the Decay parameter has no effect, and if the Sustain level is zero, the level will drop to zero at the rate set by the Decay if the key is held long enough. Setting the Sustain level to maximum means that once the attack portion of the envelope has happened, there will be no change in the sound until the key is released. The lower the sustain is set, the more the level is allowed to decay while the note is still held. Once you have let go of the key, the Release parameter governs how quickly the level drops to zero from that set by the Sustain value. If this is set to a short time, then the level will drop very quickly.

It is fairly easy to understand how these levels work if you imagine the envelope being assigned to control the overall volume of a sound. A slow Attack will fade the sound in instead of it appearing instantly, a fast Decay will make it die to the Sustain level more quickly, a high Sustain level will keep the sound at high volume until the key is released, and a long Release means the sound will take a while to die away once you have let go of the key. All analogue synths will have a volume envelope (as will 99% of all other synthesizers) so you can very quickly acquaint yourself with the effect of these controls on the volume by adjusting the parameters and seeing how they affect the sound. Of course, if you don't have all four parameters, just learn the

“Attack is the time taken for the envelope to move from the initial zero level to the maximum level.”

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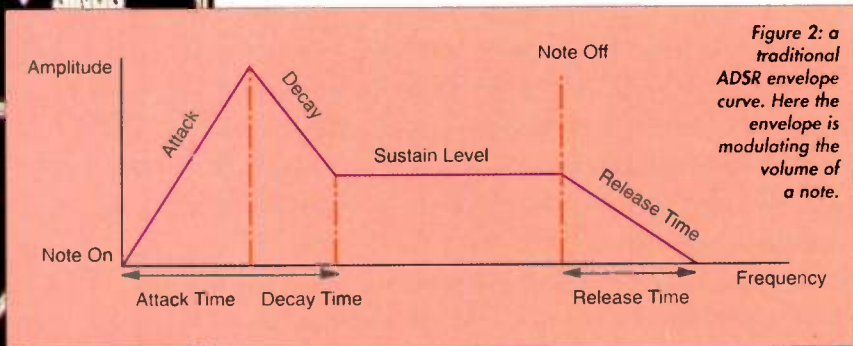


Figure 2: a traditional ADSR envelope curve. Here the envelope is modulating the volume of a note.

▶ effect of those you do have. Those of you using synths with more complex envelopes will have to wait until later in the series to fully understand how they work, when we will look at those synthesis styles which use more stages.

ENVELOPES & FILTERS

Of course, envelopes may be applied to the filter as well as the volume of a sound (this is where we came in), and this is important when creating sounds that appear 'natural' to our ears. In acoustic instruments, the harmonic content of the sounds generated often changes radically over time, as well as just the volume: a plucked string starts off very bright, but quickly dies away to just the fundamental. Even bowed or blown instruments, which can maintain a steady harmonic content over time, tend to have a harmonically brighter attack as the player accentuates the beginning of the new note. Even if you're not seeking to directly copy acoustic sounds (I've already mentioned what a non-starter this is with most analogue synths), the ear still likes to hear familiar patterns in sounds. However, when it comes to applying an envelope to the filter cutoff, things get a little bit more complicated. A volume envelope will always start from silence and return to it (otherwise the synth would be sounding even when you hadn't played anything), but this is not necessarily the case with the filter envelope. The filter cutoff may not start from

completely closed, nor may it be returned to that position. In fact, most of the time the volume envelope is used to silence the sound long before the filter envelope might achieve the same result.

However, in certain cases, you may want to use the filter envelope to remove all frequencies. In this case you would use the manual filter control to close the filter completely, and then set the envelope to open it and return it to the closed position at the end of the Release phase of the envelope. Remember to make sure the the release on the volume envelope goes on long enough to let you hear the effect of the filter envelope. It is also best if you set the volume attack to minimum and the volume sustain to maximum. In general, you should use the manual filter cutoff to set the start and end position of the filter. Remember that if the manual filter cutoff is set to fully open the filter, there is no way the envelope can affect the filter any further (unless you have one of the more flexible synths which allow for negative settings of the filter envelope). So make sure that the filter is at least partially closed before you start trying to hear the effect of the filter envelope. You will also need to set the amount of effect that the filter envelope has on the cutoff position (look for the parameter on your synth labelled Filter Env Amount, or perhaps just Filter Amount). If this is set to zero, you might spend all day adjusting the filter envelope parameters without hearing any difference! The Filter Amount control determines how much movement the envelope will induce in the cutoff frequency. If you set a large amount, the filter will probably be fully open at the end of the Attack phase of the envelope, and lesser amounts will cause it to open up less.

To imitate the natural harmonic decay heard in 'plucked' acoustic sounds, you should set the attack of the filter envelope to zero, so that when you play a note, the filter will open up fully straight away. If you use a slower attack, the note will sound more like a instrument being bowed or blown softly to start with and then increasingly harder. Again, these are just examples from the acoustic world to help you understand what you are doing, not attempts to

VOWEL PLAY

Sometimes analogue impressions of vocal sounds can work better than sampled vocals in a track, because the frequencies affected by the filtering are not directly related to the pitch of the note you are triggering, but dependant only on the filter cutoff. The human vocal chords apply the same resonant filtering effect, and they don't vary this just because you sing a different pitch. Instead, the variation is used to create different vowel sounds, independent of the note being sung. When you play a new note with even the most accurate samples, the resonant frequencies shift in strict mathematical relationship to the transposition from the original pitch. So when you transpose a sampled voice by even a semitone, it sounds more like a different person

singing the new pitch, not the same vocal chords. Whilst an analogue synthesizer will rarely be mistaken for human voices, it may well give you a more organic impression of voices used as an ambient background than a sampler whose variations in timbre directly related to pitch jar on the ear. As always, I advise people to steer clear of the idea of using analogue synthesis in direct imitation of a sound. However, analogue synths can be excellent for giving the general impression or feel of conventional instruments without being slavish imitators, especially when placed further back in the mix and given their own ambient space. When trying to produce a vocal effect on an analogue synth, the best results tend to come

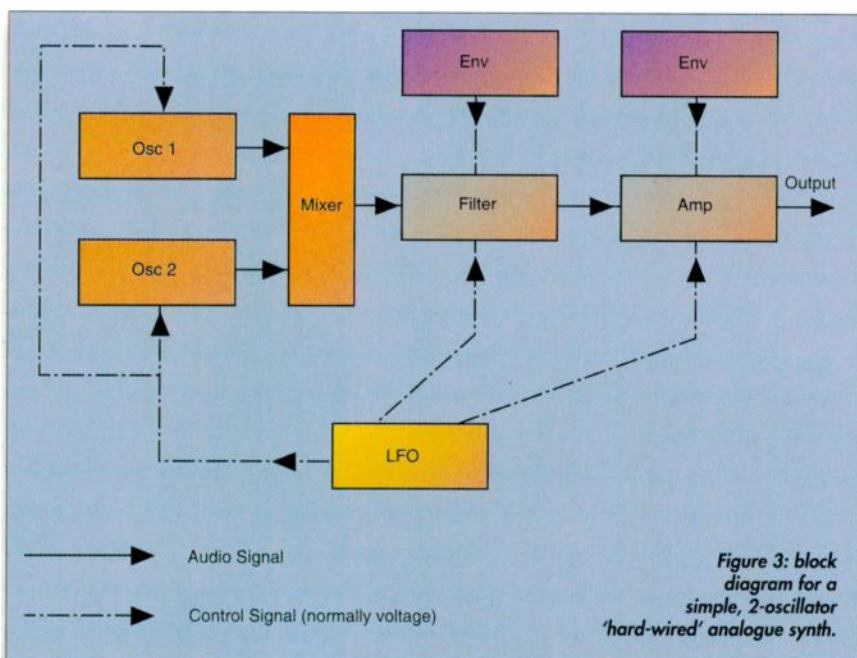
from those which have a band-pass filter setting or a high-pass and low-pass in series (essentially the same thing). Set the resonance to just under the point where it is about to go into self-oscillation, and then move the cutoff frequency (or frequencies if you're using low-pass and high-pass filters in series) around slowly. With luck you will find a point where a distinct throaty element creeps in. Patience is a definite virtue in the search for this elusive effect, and if the synth you're using has user memories, be ready to save as soon as you find it. If not, then be ready to record the part you want the sound for, as the sound can drift all too quickly on unstable old machines. My favourite machine for this is the Eika Synthex, which had two different widths of band-pass filter, a very stable resonant response, and a

ton of user memories. My 'Choirboy' patch, a serendipitous find on that machine, has fooled many an untrained ear (I'm thinking mainly of TV and film directors with that 'untrained' reference, by the way) to the point where I could probably have got away with billing them for a session with Aled Jones or whoever the current pre-pubescent warbler was! The dual filter of the OSCar is another winner for this (moving the Separation parameter controlling the distance between the two resonant peaks can create vowel sounds which give the impression of singing in a foreign language), as are any of the early Korg synths featuring the splendidly-named 'Traveller' (they don't make parameter names like that any more, do they?), which is a disguised high-pass and low-pass filter in series.

make exact copies of 'real' sounds. The great thing about analogue synthesis is that you can create lots of sounds which *don't* exist naturally, and if you have access to more comprehensive analogue synths, you should also experiment with envelope control of band-pass and/or high-pass filtering. Similarly, if it is possible to set a negative envelope amount to the filter on your synth, check out the effect that this gives. In this case, you should set the manual cutoff to the most open position that you want it to be, as the negative envelope will close the filter to start with, and then return it to the most open position at the end of its cycle.

It is always a good idea when experimenting like this to work with fairly long attack, decay and release times, with the sustain level at about half way. This gives the untrained ear more time to follow what is happening to the sound during each phase of the envelope. When you feel comfortable with the slow movements, reduce the times so that the cycle happens more quickly. Once you have heard a filter opening slowly and then sped it up bit by bit, you will soon

to the sort of signal path shown in Figure 3. Usually two oscillators (sometimes one, sometimes three) are mixed together and passed through a filter — also known as a VCF or DCF (Voltage Controlled or Digitally Controlled Filter), and then the volume amplifier or VCA/DCA (Voltage Controlled or Digitally Controlled Amplifier). Normally the filter and amplifier will each be controlled by an envelope (on some more basic synths you may have to share one envelope between volume and filter) and you will often find that your envelope(s) cannot be set to control anything else. A single LFO will probably be available to control the pitch of both oscillators (vibrato), the pulse width of one or both (PWM), or the filter cutoff. If you find yourself able to do more than this, then your synth is definitely above average. Additional routing possibilities include envelope to pitch (for automatic bend effects), pulse width and LFO amount (to delay vibrato till after the note has been held for a second, and so on), and switching a third oscillator between normal audio and LFO operation. On some synths (such as the



recognize the characteristic sweep, however fast it is happening in a sound — if you have trouble, you can always turn up the resonance, which will help pick out the filter movements.

ROUTING AND MISROUTING

Of course, envelopes can be used to control much more than volume and filter cutoff, but how much you can experiment with this will be determined by how much routing you can do on your synth. The most basic analogue synths will be hard-wired

EDP Wasp and OSCar) you may even find that you can switch the envelope to repeat its cycle, allowing for the creation of custom LFO waveforms using the ADSR shape.

At the opposite end of the scale, you may have access to modular analogue synthesizers whose routing possibilities are completely up to you; with these, you use patch cords to connect the different parts of the sound-generation and -shaping architecture together in any order you like. The degree of complexity is directly proportional to the number of patching points in the system (and

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SYNTH PROGRAMMING

► the number of patch cables you have — a steadily decreasing number in my experience!). On big modular systems, not only are the routing possibilities infinite (even discounting those which do not produce an audible result), but the actual number of oscillator, filter and envelope modules is variable (assuming you have the money — so if you want another oscillator, you go out and get another oscillator module), and you can build up ridiculously complicated routings. There comes a point where the law of diminishing returns is clearly applicable, but unless you are very experienced, long before this point you will lose all grasp of what is actually happening to the sound in your mega-patch. A good compromise between the fixed architecture of the basic analogue synth and the totally open system of gigantic modular systems is something like the Korg MS20, which has enough patching points to be flexible, but not so many as to be unmanageable or incomprehensible. This was perhaps the most successful of the 'patchable'

routed into the mixer, with the result put first through a low-pass filter and then amplifier, with an ADSR envelope each controlling the filter's cutoff point and the amplifier's level respectively. This advice is not so conservative as it sounds; it's not so much 'don't try this at home, children' as 'It pays to learn the rules before you break them!'. LFOs can be routed initially to oscillator pitch and pulse width (if pulse wave is selected on one or more of the oscillators, that is), or filter cutoff and amplifier level (for wah-wah and tremolo-type effects). Then try moving one connection at a time and see the way the sound changes; start with the points to which LFOs and envelopes are routed, as these are much less likely to make the sound disappear altogether.

Don't think it's the end of the world if you don't have an analogue synth with physical patching facilities, either. Although Sequential Circuits never went as far as offering patching cables, the Poly-Mod sections on everything from their Pro One up to the Prophet T8 give you some pretty wild routing capabilities which allow you to get away from the standard analogue setup, and most modern synthesizers have pretty flexible internal routing capabilities now that such things can be done in software. So even if your PCM-based synth doesn't have the most authentic analogue oscillator sounds, it can still teach you a great deal about the way routing works. Particularly good examples of very flexible routings are Emu's rack units, from the Proteus onwards. The only real problem with software routing is that you may have to become familiar with a lot of abbreviations, as sometimes there is not enough room in digital displays to list out

the parameters and their settings fully. So be prepared to decipher combinations of numbers and letters like OSC 1 PWM ENV or FIL TYP: BPF in the display. Whatever access you can get to more flexible routing synths, whether via patch cables or software switching, don't be afraid to experiment with bizarre routings. The more advanced techniques discussed below both evolved from people plugging things in where they weren't supposed to go! Who knows, maybe you will be the first to discover a new routing technique which will be as full of character as these two.

RING MODULATION & OSCILLATOR SYNC

The first of these, Ring Modulation, is a process for modulating one frequency with another in such a way as to produce only sum and difference frequencies, but none of the original fundamental. The original ring modulation circuit has its origins in radio communications, and was originally based around a couple of transformers and a diode bridge

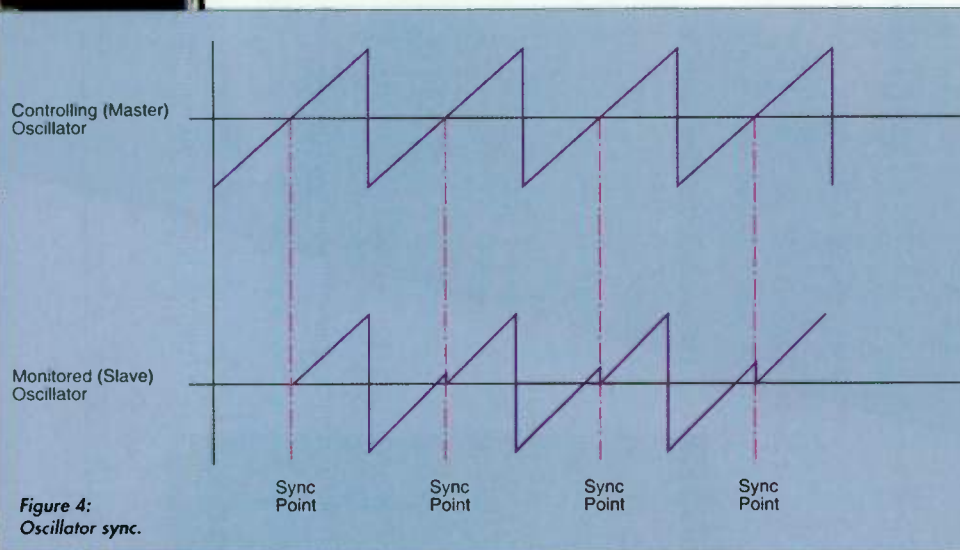


Figure 4:
Oscillator sync.

analogue machines (even though the single-oscillator MS10 was much cheaper). As a result, there are a decent number of these machines floating around out there (whilst house-hunting in Carshalton recently, I spotted one left behind by a teenage son when deserting the parental abode) although their price on the second-hand market has risen drastically of late because of the renewed interest in all things analogue. However, once you have mastered the fixed routing of the simpler analogue synths, such 'patchable but simple' analogues are ideal for learning the more advanced applications of analogue synthesis — if you can track one down.

So, when the routing of the analogue signals is left up to you, what are you going to do with your new-found freedom? Well, as we so often discover when all constraints are removed, many of the possibilities opened up actually lead nowhere at all or, to be more literal in this case, result in silence. So you should actually start by recreating the signal path shown in Figure 3; one, two or three oscillators

CUTOFF-FREQ.

ENVELOPES (EG):

or ring (hence the name). Subjectively similar effects can be created by routing an oscillator operating at an audible frequency into the LFO input of another audio oscillator, which is possibly how the effect was first discovered. This would probably have originally have been done on a modular system, but it is also possible on the classic MiniMoog/MemoryMoog design, which allows oscillator 3 to be switched between audio and LFO function. By switching to the LFO routing, but keeping the frequency in the audio range, you can modulate the pitch of the other oscillator so fast that you produce new frequencies which are multiples of the two source oscillator frequencies,

“Oscillator sync is ideal on lead synth sounds, where it can make the synth scream like a distorted lead guitar...”

many of which are not in the normal harmonic series of either oscillator's fundamental frequency. This produces a range of sounds with a metallic quality, and is therefore useful for making bell sounds or more abstract timbres. Whether the sound has a slight metallic edge to it or is completely atonal depends on whether the frequencies of the two oscillators are closely related or not, as well as whether the pitch of one is being moved in real time as you play it (by an envelope or LFO, for example). As very small adjustments to a ring-modulated oscillator's frequency can make a major difference to the timbre produced, you will find the results can be unpredictable but very rewarding.

Another technique which produces major changes in the harmonic content of the sound, but is less radical in terms of those harmonics' mathematical relationship to the fundamental, is oscillator sync. In this specific configuration, one oscillator's cycle is synchronised to that of a second. This forces the waveform of the sync'ed oscillator to restart its cycle each time the other one crosses the zero point going from negative to positive (see Figure 4). As a result, the fundamental frequency of the slave oscillator is kept the same, but the waveform is radically changed. The pitch of the controlling oscillator is not normally added into the audio mix, but instead can be shifted by pitch-bend, envelope, aftertouch or LFO. This makes radical changes to the harmonic content of the synchronised oscillator, but without making the fundamental pitch as weak as ring modulation does; instead, the higher harmonics around the pitch of the moving oscillator are picked out. Oscillator sync is ideal on lead synth sounds, where it can make the synth scream like a distorted lead guitar, or on bass sounds, where it makes the bassline stand out with a really hard edge. Oscillator sync is to be found on many analogue synths, from the classic Prophets and Moogs to the more recent Novation BassStation Rack and Yamaha AN1x. It is another one of my favourite features on analogue synths, giving unparalleled expression to the sound when the pitch of the controlling oscillator is linked to aftertouch or one of the mod wheels. However, like ring modulation, oscillator sync is not, strictly speaking, a 'subtractive' technique, in that it adds to the frequencies originally present in the oscillator waveforms (although you shouldn't let that stop you making good use of it!). As such, these techniques make a good bridge from 'straight' subtractive techniques to other calculation-based styles of synthesis, which use multiplication and waveform manipulation to produce frequencies outside of the normal harmonic series, such as Frequency Modulation and Phase Distortion. In the next part of this series, we will look at the most successful of these 'multiplication' synthesis types, Frequency Modulation, or FM.



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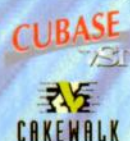


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RICHARD BUSKIN talks to LA-based mix expert **Jon Gass** about his work with the likes of *Babyface* and *Boyz II Men*, his striving for vocal perfection and his struggles with sibilants...

“**M**ixing, to me, is so much more creative than recording,” says Jon Gass. “You’re actually doing the creating, as opposed to waiting for the artist to show up. In fact, I don’t think you even know how to track music until you’ve done quite a bit of mixing.”

Gass has forged a considerable reputation on the basis of behind-the-board heroics that fly in the face of straightforward balancing or dabbling with effects. For him, mixing is the most important part of the record-making process, and it therefore warrants more than the mention that it often gets in producer or engineer interviews.

At the same time, it should also be pointed out that, as an engineer during the earlier part of his career, Jon Gass seldom worked with groups in a live setup within the studio. You see, contemporary R&B has always been his musical lot in life, and so he would find himself either capturing concert performances for that live feel, or getting busy with a drum machine and a bunch of keyboards back in the studio.

Still, none of this has exactly hindered his

machines helped me to figure out how to double parts and do overdubs,” he now says. “You know, the ‘chain of hiss’! Still, it was just cool to have stuff doubled and tripled...”

Eventually the cassette decks were augmented by slightly more up-market gear, and then in 1980 Gass relocated to Los Angeles, where he started working at a small 24-track studio. “That place charged, like, \$35 an hour for the room and I was included in the price,” he recalls. “Basically, it was a cheap mix joint for R&B — they’d cut the tracks at an even worse studio!”

Over the course of about three and a half years, Gass learned the ropes of both recording and mixing, before branching out on his own in 1984 and working on R&B assignments for Solar

mixmaster

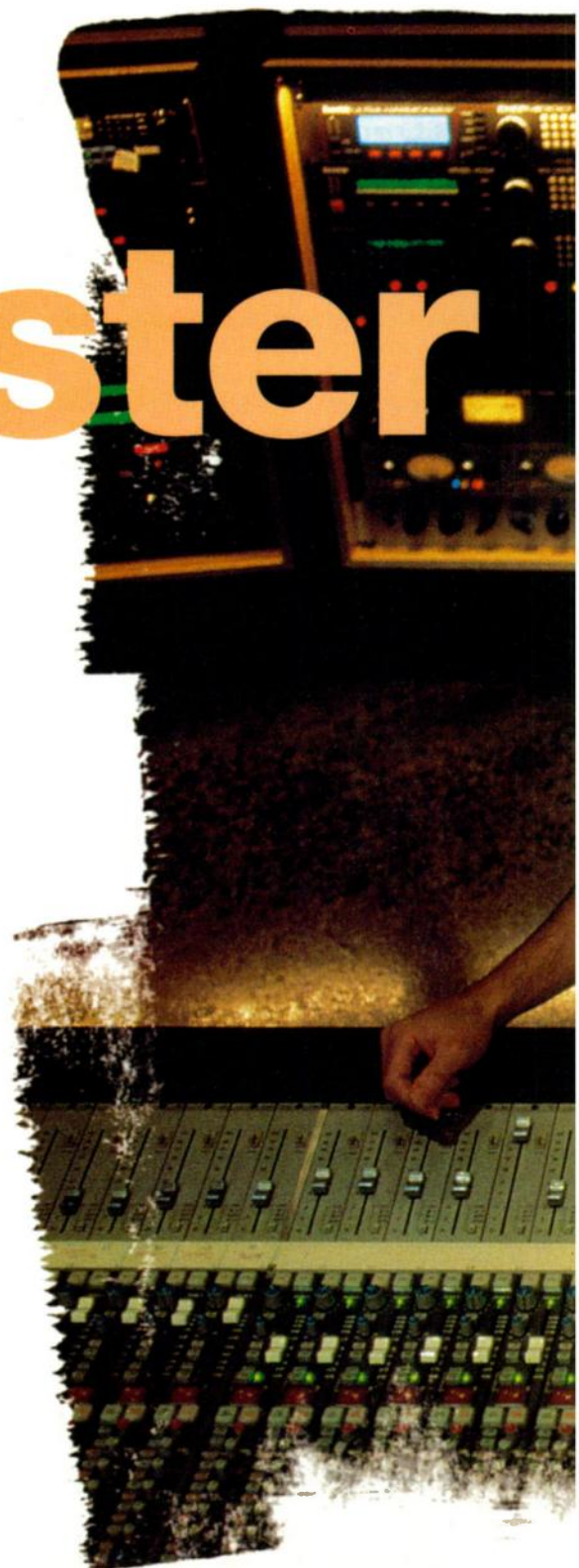
JON GASS

progress. Babyface, Whitney Houston, Paula Abdul, Jermaine Jackson and Bobby Brown are just some of the artists whose records were recorded and mixed by Gass between 1985 and 1990, while Houston and Babyface are also among those who have since benefited from his skills as a full-time mixer. The others? Toni Braxton, Madonna, Boyz II Men, Vanessa Williams, The Bee Gees, Kenny Loggins, Maxi Priest, Aretha Franklin, David Bowie, Earth, Wind & Fire, Robbie Neville, Natalie Cole, The Gap Band and Smokey Robinson, to name but a few.

“I absolutely love other forms of music,” Gass stresses, “but once you establish a reputation for yourself in this business it’s hard to break away from it. Over the years I’ve been labelled as the guy who mixes the hard dance songs, and then at other times I’ve been a ‘specialist’ in ballads. I don’t understand it. It’s funny to see how you’re sent certain stuff just because that’s what you did a couple of weeks ago. I have mixed a few rock records but, overall, R&B has tended to be my thing.”

THE CHAIN OF HISS

Greatly influenced by the music of the Beatles as a youth, Jon Gass got his first guitar at the age of 10 and spent most of his teenage years playing in a variety of bands around his native Oregon. At the same time, he was always interested in recording technology, even if his personal assets in those days only stretched to financing a ‘home studio’ consisting of three cassette decks. “Those



Records. Among the label's clients were LA Reid and Babyface (real names Antonio Reid and Kenneth Edmonds), who moved to Los Angeles in December of 1985, and for whom Gass immediately began engineering. This would be the beginning of a beautiful friendship between Gass and the two producers, and one that continues with Babyface to this day, in spite of the fact that he and Reid — once co-directors of LaFace Records — have now gone their separate ways.

Jon Gass' modus operandi reflects his opinion that, for him, mixing affords more creativity than the actual recording process.

"You can make everything sit in a different space," Gass explains. "It's just so important. For instance, when Babyface comes in to listen to a mix

that I've done or I'm working on, he doesn't say, 'Wow, that sounds good!' He's not that concerned with each sound, but with how the mix actually feels. As long as it feels really good and he wants to hear it again, that's what's important to me. It doesn't matter if maybe one little part that he heard was louder on the demo. What's that got to do with it? No one else has heard the demo. It's just got to feel good — it's got to build the right way, it's got to have emotion around the singer. Not every singer has perfect emotion all of the time. So, if you can build the mix and create these textures around the vocal, that's really what it's about. It helps sales.

"For me, the main objective is to keep the lead vocal natural and crystal clear without destroying the band. A lot of mixers just seem to head for the



“For me, the main objective is to keep the lead vocal natural and crystal clear...”

OBSESSED WITH 'S'

There's one thing that has virtually turned into an obsession for Gass — sibilance. Basically, he can't stand it, regarding it as nothing less than a curse on a good record, yet it stalks him. He hears it in people's speech, in their singing... even his own name can be horribly abused — “Er, excuse me, is your name Jon Gasssssss?”

“You know, I'll be sitting on a plane and be able to hear the 's's of a guy who's sitting six rows back,” he groans. “I just want to go back there and hand him some real-time vocal de-esser! I can't sleep, I cannot even relax when I hear that sound. There was one particular flight back from Atlanta where all I could hear was this guy's sibilance, and oh, it was brutal!”

When, where and why, I ask, did this whole obsession start? At a mastering session back in 1987, for a record by a minor artist whose name Gass no longer recalls. Some sibilance had crept into the recording, which Gass himself had no involvement with. He was the mixer and didn't consider the problem to be all that bad, yet during the mastering the entire track had to be de-essed, and in the process the sound of the percussion was destroyed.

“I've been obsessed ever since,” Gass now admits. “I know most listeners couldn't care less

▶ ‘telephone’ lead vocal sound, and sure, that makes the job really quick, but it won't fly with some of the high-calibre singers I work with. Try that with Whitney or Madonna and it's going to be. ‘Have a nice day. See ya!’

“I therefore start a lot of mixes with the vocal. If it doesn't already sound pretty natural I'll try to correct that, and then I'll bring the instruments in around it. A lot of other people will work on a mix for hours and not even listen to the lead vocal, and that amazes me: sooner or later it's got to be there, so you might as well get used to it.”

CORNERING THE ENGINEER

While Babyface's engineers vary from project to project, Jon Gass takes care of about 90% of his mixes. Now, the usual process is for the men behind the board to decide on the technological approach and equipment that are required to realise the artist and producer's objectives. However, when Gass is involved with the project he doesn't hesitate to chip in with how he thinks things should be done.

“I often corner the engineer and say, ‘Hey, back down a little bit with the attack time of the compressor on the vocal. You're clipping it off a bit too much, so try this...’ The producer may be concerned with the performance and not thinking about compression attack time and all that, and the same often goes for the engineer who isn't thinking about the mix, which he'll have no part in.”

Is this attitude the result of his opinion that you need to mix before you can really know how to record?

“Yeah, it was after I'd been mixing for a year or two that I started to recognise the frequencies that make things work better on tape,” Gass replies.

about this whole thing, but it drives me insane. Basically, the rule is to keep the 's's at about the same level as the vocal air, but the hard part is that you have to achieve that without making the artist sound as if he's just been punched in the mouth! I hear records all the time where people clearly haven't got the hang of it; you can't make out what the singer is saying — there's so much compression or whatever that it almost sounds distorted. So, there are other people who obviously don't like 's's either, but they don't quite know how to get rid of them yet!

“On the other hand, I do remember working on a song way back where an 's' hit right at the same time as a snare. Now, without the 's' on the word it changed the meaning of the song, but I couldn't get the 's' loud enough because the rattle of the snare just wiped it out. There was nothing I could do, and it was kind of tragic actually. The only thing that really could be done was to just roll the top end off the snare...”

In this particular case maybe Gass could have done with a re-esser instead of a de-esser.

“On that occasion, yes! Anyway, at this point I'm really into side-chain de-essing, where I just run a compressor in the side-chain mode with an EQ on it and pump up the frequencies that are bad. There's a way of doing that on the SSL that is really excellent.”

“I don't think you even know how to track music until you've done quite a bit of mixing.”

“Especially vocals. It's so important to get it right during the tracking, rather than just set up a microphone, hack it onto tape and think, ‘Ah, I'm not mixing it anyway. Who cares?’ I have certain microphones and I'll only record with those: highly modified Steven Paul mics that sound beautiful. The top end is the secret. They're very smooth, very silky, very breathy, and any time that you have the right kind of breath on the mic you're half-way home in the mix.”

So, what we have here is the mix engineer telling the recording engineer what vocal mic he wants him to use?

“That's right. I mean, with a lot of the outside projects I don't know what mics they use — I've certainly learned from them what not to use! For instance, I hate [AKG] 414s on vocals, and I can usually hear if one has been used even before the tape has been put on the machine... I can hear it as the tapes walk by! ‘There's a 414 on that vocal! Oh no!’ The problem with that mic is that the really sibilant area is right in the mid-range — the 2 and 3k range — and the only way that you can cut out the 's' sounds, which are like knives cutting through the tweeters, is to take out part of that range. That, however, is where all of the clarity is. It's just brutal and there's no hope. You've got a long day ahead of you.”

I'VE GOT YOU, BABE

To date, Jon Gass has mixed and engineered more than 80 Top Ten singles, including 28 Number One pop and R&B songs, many of which are attributable to one particularly able individual: Babyface.

“With Babyface, recorded material may sit around for six months without his knowing which artist is going to take the lead. For the *Tender Lover* album we cut about 35 songs — he sang on them, all of the parts were laid down — and then, when they were completely finished, with some of them he would go, ‘Nah, it's not for me. I'll put it on someone else's record.’ After that he would use the lead as a guide vocal for whoever else performed the song.”

One of the more recent tracks on which Babyface and Gass have worked together as producer and mix engineer is ‘Mama’, a ballad from the soundtrack to the movie *Soul Food*, featuring the harmonising vocal talents of Boyz II Men, together with drums, acoustic piano, Fender Rhodes, synth strings and electric guitar. A fairly straightforward song to work on, it nevertheless points up the way to how Gass likes to focus on vocals, which, in this particular case, took up a total of 10 tracks — four leads and six harmonies.

“I was chiefly concerned with getting the vocals to feel as full as possible while still being able to hear the instruments,” he says. “The first thing that I did was push up the lead vocals and

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Jon Gass



“Any time that you have the right kind of breath on the mic you’re half-way home in the mix.”

THE BOTTOM LINE

Gass happens to think that the SSL mixing desk is really excellent, having used it as his console of choice for the past 11 years.

“Back in '90 somebody gave me a hard time and said that he really wanted me to do a certain mix on a Neve,” he recalls. “I asked why and he said, ‘Because you can’t get any bottom out of an SSL’. Well, just a couple of months before that I think there were 22 songs that I had mixed on the R&B charts all at once, and so when this guy made that statement I got so mad that I raised my rates to everybody! ‘You can’t get bottom out of it, right? Okay!’ It really doesn’t have anything to do with the board as to whether or not you can get bottom. What would even possess somebody to think such a thing?”

► check what the main problems were going to be. These amounted to a lot of different sound changes and vibe changes, because certain parts of each section had been recorded at different times. So, one line might be kind of a warm, close-miked sound, and then the next one might be a more distant, much thinner sound.

“The other thing is that the lead vocal on this track switches between three of the singers, so once I’d found the key to one lead vocalist my work wasn’t over: I had to figure out how to smooth out the sound between three people. Splitting to different tracks and re-EQ-ing each of the sections so that they still sounded really warm was the hardest part, and for that I used a ton of outboard gear.

“I used 30 different channels of compression — insane! These comprised Avalon, Summit, Tubetech, Teletronics, and Urei 1176s and 1178s, all installed in the room here, along with a bunch of dbxs that I don’t use.”

The room here is at Brandon’s Way in Los Angeles, where Gass sits behind an 80-channel SSL 4080G Plus board with Ultimation, and likes to mix very quietly on JBL Augsberger monitors and Yamaha NS10s.

“This room is packed with gear, and my poor assistant has to write a book at the end of every song for all of the recalls! I use tons of outboard gear and sometimes it doesn’t sound as if I’m using any. I might use 10 or 15 different reverb delays in the mix, but I don’t really use ‘long hall’ or any of those types of reverbs. They’re all either really short or a chorus, and I use them to create space without destroying the track with EQ. That would be the last thing I’d do. I’d rather create a little vibe, and that’s not down to training but just a musical way of mixing. That way it’ll sound good at home, because I’m not trying to squeeze things so hard.”

THE PERFECT BOTTOM

Gass likes to start introducing the instrumentation fairly soon after he has played around with the

vocals, in order to see how far he’ll have to go to make everything fit together. In a practical sense this means ascertaining what is going to clash with the vocals in terms of the frequency, and on ‘Mama’ the clashing involved the strings.

“Strings are usually very tough,” Gass says, “especially when you’ve got a Rhodes, a guitar and so on, which are already in the mid-range. On this track, I had to get the strings to feel natural and cut around all of the vocals without being screechy, and thankfully I managed that.

“Otherwise, there was a lot of balancing, trying to get the track to work without major EQ, playing with drum reverbs and working on the bottom end. Of course, with R&B that’s probably the second hardest part of the mix, getting that bottom right without blowing up everybody’s stuff. On ‘Mama’ I used a sub-harmonic synthesizer on the bass, and then got the kick to work with it. Once the bottom was okay and the air was just right on top of the vocals I was halfway home.

“A lot of mixers go into the computer really early to make it work, but I try to wait until the last second. I’ve got to make it sound good without putting the computer through its paces, because in the long run I think it makes you work harder to get the sounds to work together, as opposed to having to cut stuff all of the time just to be able to hear the music. Then, when I do go into the computer, I do the swells and little vocal rides that make the track musically come alive.

“For me, the mix usually sounds bad when I start and it sounds worse until just before the end. Then, suddenly, it all makes sense. So, if somebody walks in before I’m ready I’ll ask them to hang on and wait until I’ve finished. They may think, ‘If he’s been working on it for this amount of time it should sound better than this,’ but in fact it’ll sound worse than it did four hours ago, because I’m trying all sorts of different things to try to get it to sit right. I love trying stuff. That’s the fun part; trying stuff without rules. Especially when somebody says, ‘Don’t do this’; I’ll think ‘Why?’ and want to do it right away!”

In line with his preference for the unconventional, Jon Gass opines that, after a few tracking dates, the apprentice engineer should immediately be introduced to the art of mixing, pinpointing the mistakes that have been made during the recording and, aside from learning how to fix them, taking note of how to avoid making them in the first place.

“Yeah! Don’t only learn what to do, but what *not* to do. Some young guys think that if they can pick up some techniques from the pros then they’ll be able to mix, but it doesn’t work like that. Every song, every artist, every bottom end on every track, represents a brand new day. It’s just like starting from scratch, and that’s where I think the years of experience really help you. I mean, you can stumble through a few sessions, but sooner or later you’re going to get snagged!”

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If you're recording and editing MIDI + Audio on a PC, you'll want to try a piece of the latest Cakewalk.

JANET HARNIMAN COOK reports from the kitchen.

Cakewalk Music Systems have defined the cutting edge of PC sequencing since *Cakewalk Professional 3* for Windows 3.1 first saw the light of day way back in 1994, and its successor, *Cakewalk Pro Audio v4*, was the first PC application to combine multi-port MIDI sequencing with multitrack hard disk audio using internal PC soundcards. This tradition of innovation is continued by *Cakewalk Pro Audio 6*, which adds a host of new features, many of which were the stuff of dreams not so long ago: a virtual effects rack featuring high-quality on-board real-time audio processing; multi-channel audio output from multiple Windows soundcards, and *Cakewalk Studioware* to provide sophisticated MIDI control of external studio equipment.

FEATURES

Cakewalk Pro Audio 6 is a 32-bit native Windows 95 package (legacy Windows 3.x is no longer supported) and provides 256 MIDI tracks using multiple MIDI ports, and unlimited multitrack hard disk audio recording — the power of the host PC being the only

the interactive MIDI composition program, and *Hyphenator*, a lyrics editor; and impressive DirectX plug-in demos of QSound Labs *Q-Tools* 3D spatial processing and Waves *Native Power Pack*.

EASE OF LEARNING

Although *Cakewalk Pro Audio 6* has a wide range of sophisticated features, its basic functions are simple and accessible, and the newcomer should find the learning process enjoyable and productive — Cakewalk Music Systems have gone to great lengths to make this as easy as possible by including an excellent printed manual, on-line Windows Help and multimedia tutorials on CD-ROM. The manual is now a chunky 560 pages and includes an index and tutorials; it's comprehensive, easy to read, and will prove invaluable to both novice and expert users. The installation CD-ROM contains *Cakewalk TECHniques* — 11 rather hissy but nonetheless very informative Lotus multimedia tutorials, which cover the basics of MIDI + Audio recording and editing, including panels and audio effects; further tutorials on more advanced techniques can be found in the

NOW WE ARE Six

CAKEWALK MUSIC SYSTEMS' CAKEWALK PRO AUDIO 6

restraining factor on the number of audio tracks you can record and play back. The timebase is variable between 48 and 480ppqn, and all standard SMPTE timecode frame rates are supported.

Cakewalk Pro Audio 6 is the first Windows MIDI + Audio sequencer to enable simultaneous playback and recording from multiple full-duplex DSP-based 16-bit Windows soundcards. Though in theory any 16-bit soundcard should work, there have been reports on the web of difficulties with older Soundblaster cards, although these problems are probably caused by the shortcomings of the card design. Anticipating the next generation of internal audio cards, *Cakewalk* supports multi-channel, multi-driver output cards including the Antex and AdB Multiwav — but not, as yet, the Emagic Audiowerk8 card — as well as Digidesign Session 8, Audiomedica III, Soundscape HDR1 and Digital Audio Labs v8.

PACKAGE

The *Cakewalk* package includes the installation CD-ROM, a soft-bound user manual and registration documents; the Deluxe edition additionally includes the twin CD-ROMs that comprise the *Cakewalk Musician's Toolbox II*, which is crammed full of goodies in the form of MIDI files, audio samples, and extra tutorials, including *Riffs 2.2* for the Lyrrus G-Vox MIDI guitar system. Like much US-produced software, *Cakewalk* is not copy-protected, and the installation CD-ROM contains the *Cakewalk Pro Audio 6* setup files; demo songs; a techniques tutorial; full working versions of *Jammer Hit Session*,

Cakewalk Musician's Toolbox II CD-ROM set.

USER INTERFACE

Cakewalk has an excellent graphic user interface, with good use of colour and attractive screen designs, as well as a wide range of customisation options. The main screen is very neat and easy to read, but its austere spreadsheet look owes more to DOS than to Windows 95; it must be due for a facelift. The improved colour definition is very welcome, though, and the multicoloured Clips brighten things up. It is now possible to save the layout of your workspace when you quit a song, but it would be even better if *Cakewalk* enjoyed the powerful save screen layout functions found in Emagic *Logic* and IQS *SAW Plus*. These applications allow you to save multiple screen configurations and recall them via hot keys, and this would be especially useful in *Cakewalk* — it relies so much on multiple window working that recalling specific layouts for audio editing, multitrack, panel creation and so on would be very handy.

The fact that *Cakewalk* was developed specifically — and exclusively — for the PC is evident in the high degree of Windows integration it exhibits: powerful right-mouse-button menus give fast access to the more commonly used edit commands; non-hierarchical multiple-screen operation brings advantages such as the ability to save songs from within editors without first returning to the front page, and the freedom and speed of movement provided by the superb range

pros & cons

CAKEWALK PRO AUDIO 6 £349

pros

- Excellent multitrack audio recording and editing.
- Stable, fast and fun to use.
- Superb real-time multi-channel audio effects processing.
- Supports multiple soundcards and multi-channel cards.
- Audio quantise.
- Superb value.

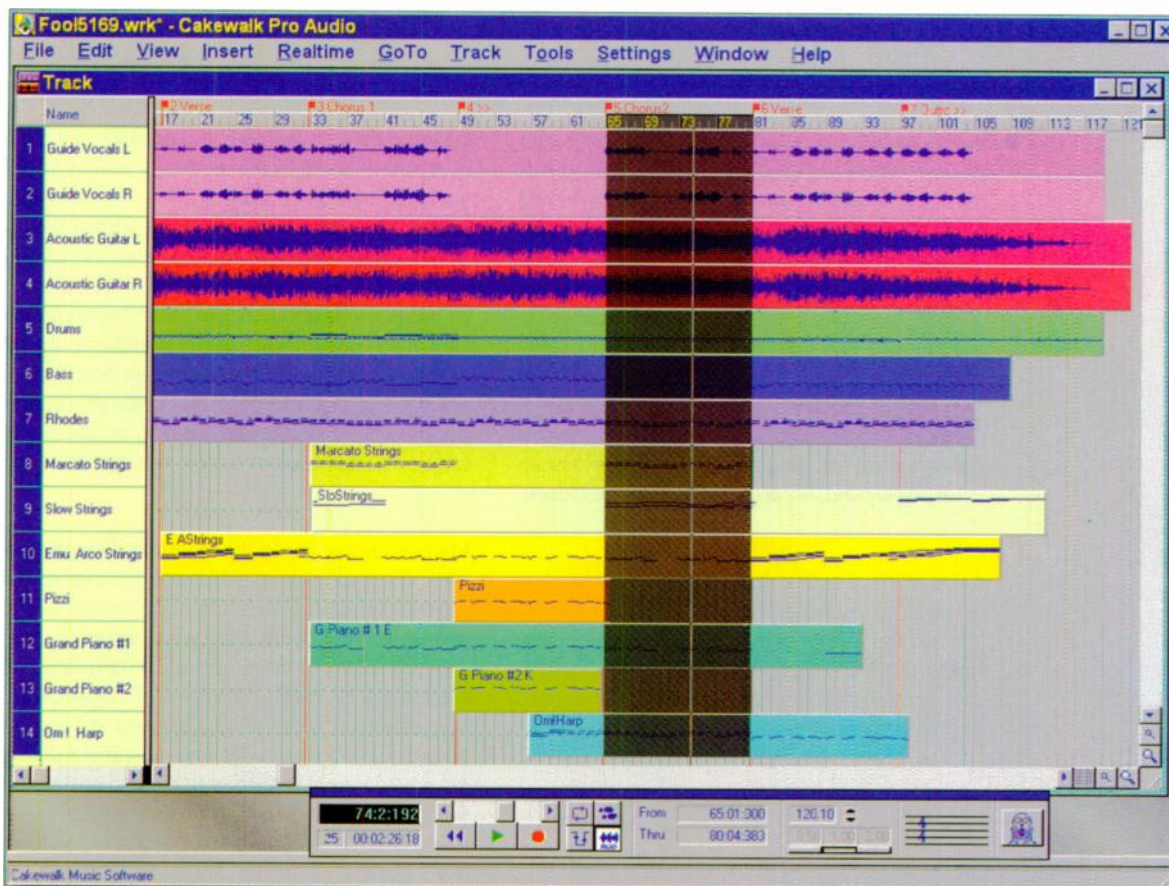
cons

- Poor MIDI-activity indicators.
- MIDI Drum and Controller editing under-specified for professional use.
- Slow zoom functions.
- No list-based Global Tempo editor.
- Slow audio load.

summary

Cakewalk Pro Audio 6 is a massive upgrade and exhibits a sophistication of MIDI + Audio integration unseen before on the PC.

SOUND ON SOUND



Left: In need of a facelift? The Cakewalk front page, showing Track view with custom-coloured audio and MIDI Clips.

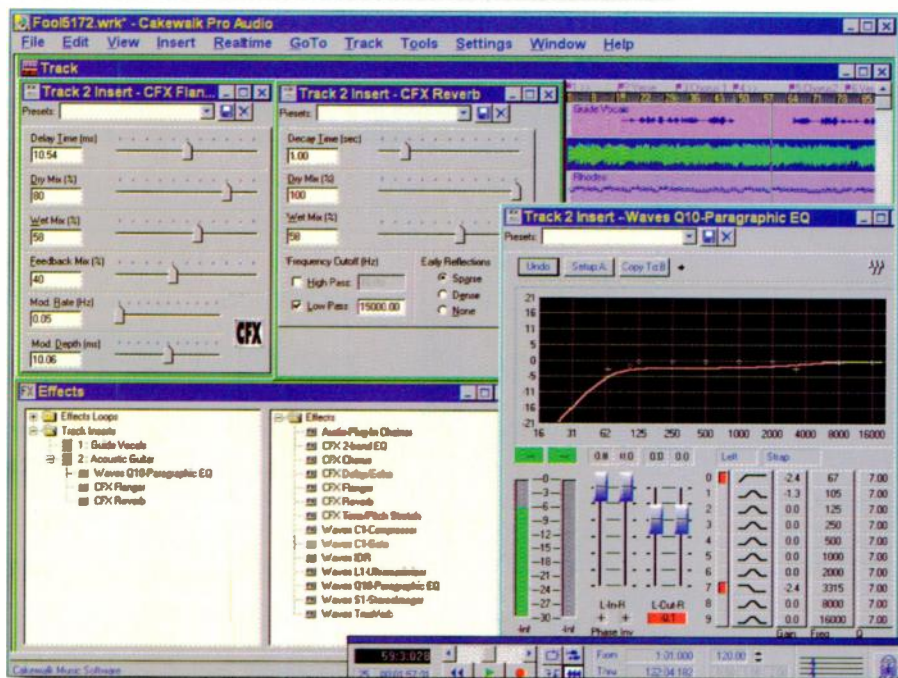
Below: A Live Audio FX chain showing Effects view and CFX Reverb and Chorus and Waves Native Power Pack Q10 modules.

of user-definable keyboard shortcuts that complement mouse activity make moving around *Cakewalk* — well... a piece of cake.

FRONT PAGE

The *Cakewalk Pro Audio 6* front page consists of the Menu bar, the Track view and the Control bar. The Track view contains the Track pane, where you'll find the instrument definitions that determine the default record and playback parameters for each track, and the Clips pane to the right displays the Clips themselves — these are coloured rectangular blocks containing MIDI or audio material, or both, and they scroll horizontally during recording and playback. Clips can be named, copied, split, erased and combined (but, curiously, cannot be muted individually) and always follow the Track parameter definition set: it isn't possible to embed parameter changes in *Cakewalk* Clips as you can in *Cubase* and *Logic* track parts. New in *Cakewalk* is the ability to create linked audio and MIDI Clips which are equivalent to *Cubase* Ghosts and *Logic* Aliases — edits applied to one linked Clip produce identical changes in the others. Linked Clips can be a great time-saver if, for example, you want to use a backing vocal Clip in each chorus of a song — using linked Clips means that volume changes applied to one linked Clip affect them all, saving the hassle of re-editing Clips individually as you'd have to with normal copies.

The range of information conveyed in the Track pane display is comprehensive: you can see at a glance the current default track definitions, and you're spared delving into Track Inspector boxes for each channel to grapple with the arcane complexity of the *Logic* Environment, or the vagaries of the *Cubase Studio* module! The quality of Instrument



Definition afforded by *Cakewalk Pro Audio 6* is, quite simply, superb: here you have an elegant, clear and simple database in which you can store the bank, voice and note definitions of all your MIDI instruments — and, to help you get started, *Cakewalk* contains factory preset lists for most common instruments, and you can also create lists for your custom banks from here or by editing the instrument INI file in your word processor.

CONTROL BAR

The Control bar can be docked anywhere on screen, and contains the most commonly used

CAKEWALK PRO AUDIO 6

► transport and locator functions. The current cursor position is displayed both as measures (bars, beats and clocks), and as time in SMPTE format (hours, minutes, seconds and frames). The Playback and Record icons function as expected, but the Rewind button returns the current position cursor to bar 1 or to the Autos Shuttle start time if you are in that mode. The Control bar also displays the current tempo, metre and time signature, SMPTE/MTC format, Step Time, Record mode and Clock source selection buttons, but doesn't contain a metronome toggle switch or a snap value display and, unfortunately, cannot be hidden.

NAVIGATION

Cakewalk's selection procedures have improved significantly with version 6 — individual Clips are selected by clicking on them with the mouse, while holding Shift and clicking lets you add further Clips to the selection; groups of Clips can be selected by enclosing them in a box or lasso, pressing Ctrl-A

“Powerful right-mouse-button menus give fast access to the more commonly used edit commands.”

selects all Clips on all tracks, and dragging along the ruler defines the selection by time. Clicking on the track number toggles the track from the selection. Selection using the lasso operates exclusively — in other words, only those events that are completely enclosed by the box are included. This contrasts with *Cubase*, where if any part of an event block is contained in the lasso area it is included in the selection, but it's ultimately just a question of style, as both methods work well. Selection procedures carry through to the editors, and notes and events can be selected using the same techniques.

MARKERS

Markers appear above the measures ruler and are static text flags that may be used for a variety of functions, such as defining song sections, cue positions, and temporary edit points, and in selection routines. The difficulties of song-structure editing that were once the bane of *Cakewalk* are now resolved, and although *Cakewalk* still doesn't quite possess the global editing muscle of *Cubase*, it is now considerably easier to cut and paste song sections. To copy a song section, you first add markers at the start position of each song section; next, deselect all tracks and click between the markers that define the section you wish to copy; then add tracks to the selection by clicking on the

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track numbers, before finally cutting and pasting the material to its new location. Markers are displayed in the Piano Roll, Staff and Audio editors and may be repositioned by dragging; the Markers view will let you rename and lock the markers to a fixed time, independent of tempo changes.

Despite having a very good magnification range in all views — the Audio editor can display the waveform at a magnification of one sample per pixel, while a maximum of 19 bars can be viewed at once in the Piano Roll and Drum editors — the program gives you little actual control of zoom levels: you're limited to clicking on the two magnifying-glass icons. Zoom power is one of the main determining factors of editing speed, so I'm surprised that there's no provision for hot key assignment.

Although tempo changes can be made from Insert/Tempo, global tempo editing must be performed from the graphical Tempo view. Graphic editing is great for drawing tempo curves, but can be a nightmare for very fine edits that require the speed and precision of a list-based Tempo editor. Tempo view contains a Stretch Audio function which time-shifts audio to match tempo changes but, although this produced good results on a single track of audio, it didn't work at all when I tried it in the review song (two audio plus 11 MIDI tracks).

MIDI

MIDI data can be recorded into *Cakewalk* from external devices such as a MIDI keyboard or MIDI guitar, or added manually from within the editors; it can also be imported as a Type 0 or Type 1 MIDI file but, as these MIDI file formats originated in the pre-MIDI + Audio era, all audio material contained in the original songs will be excluded — it is extraordinary that a new MIDI + Audio universal file transfer format has not yet emerged.

Global MIDI activity in the program is monitored by the MIDI indicators found on the Windows 95 taskbar, installed with the application files. It was only with version 5 that *Cakewalk* finally conceded that some form of MIDI activity monitoring was required, and I am amazed that such a minimal solution was considered acceptable: on my review PC at a screen resolution of 1024 x 768 pixels, with 64,000 colours, the MIDI indicators were very small and difficult to see — a modern multi-port MIDI system requires good MIDI activity indicators at both global and individual track levels.

THE EDITORS

Cakewalk Pro Audio 6 now supports RPN and NRPN (Registered and Non-Registered Parameter Number) editing — these events are often used for

DIRECTX FILES

In March this year, Microsoft's Windows 95 ActiveMovie and ActiveX audio plug-in technology was renamed DirectX to distinguish it from the Internet Explorer player control applets. The name ActiveMovie still appears on versions of software that pre-date the change, including *Cakewalk Pro Audio 6*. In common with all DirectX plug-ins, *Cakewalk CFX* modules can be used in all applications that support DirectX, such as *Sound Forge v4.0a* and *WaveLab v1.6*. The following DirectX standard plug-ins are available: *Waves Native Power Pack*, *QSound Labs Q-Tools and AX*, and *Tracer Technology DART Noise reduction* — contact Et Cetera Distribution for details.

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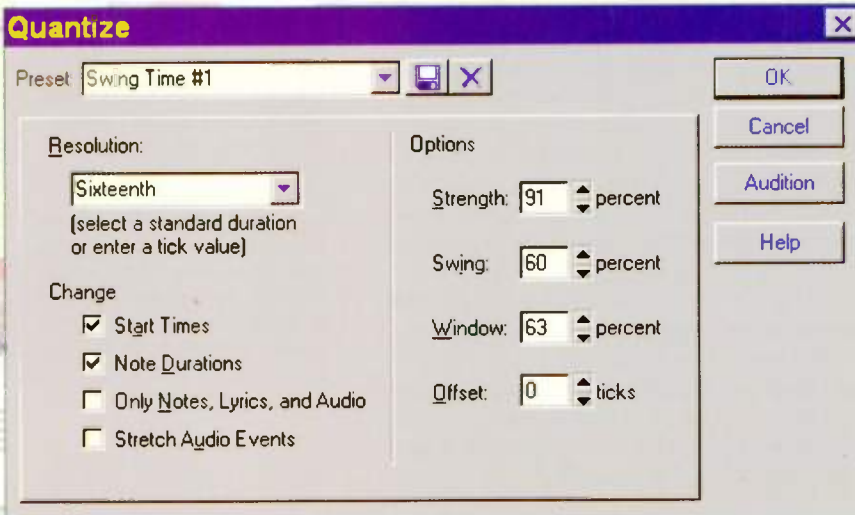
Audio events may be quantised by both start position and length.

► Bank selection on older MIDI instruments and are, in effect, four controller messages bundled as a single event. *Cakewalk* editors display information for the whole track or tracks selected, regardless of any existing time or Clip selection. Many edit

common editing procedures can be executed in real time during playback, and the open surface of the *Cakewalk* architecture makes it possible to save changes as you make them, or even switch between tracks, without leaving the editor and disrupting the momentum of your session.

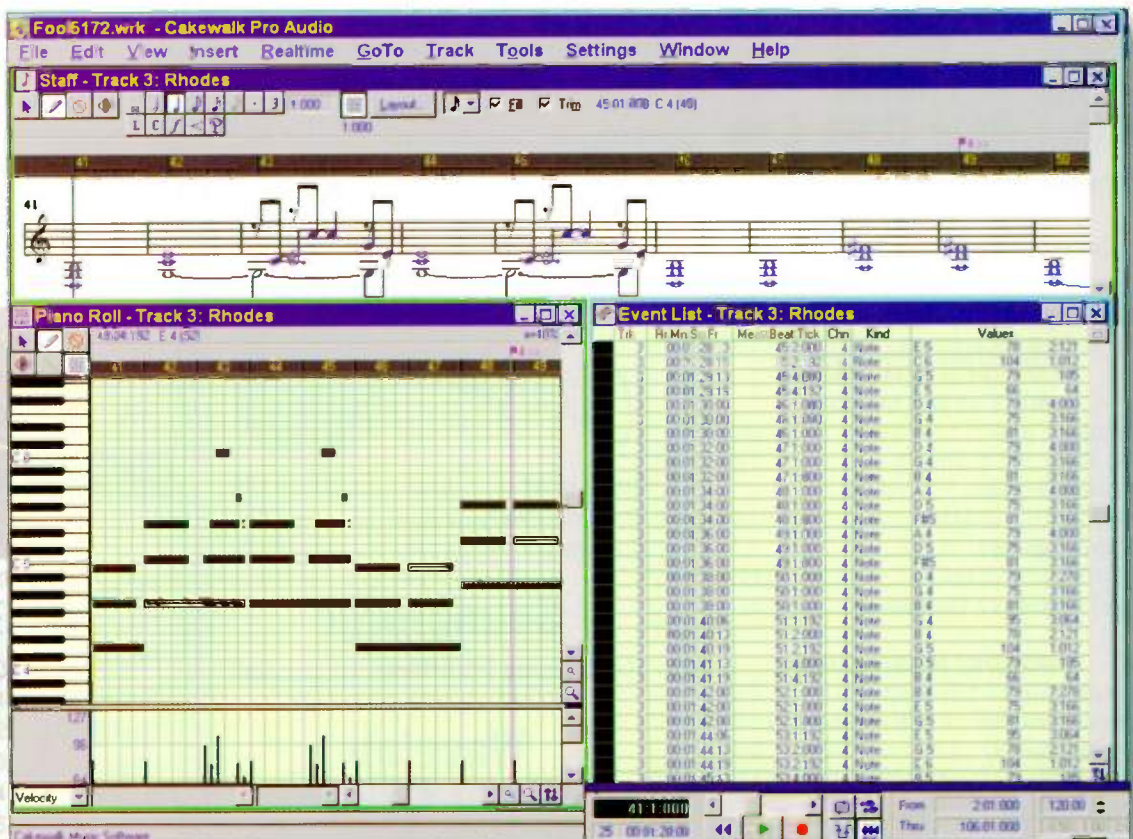
The Edit menu contains additional tools, including a 128-stage Undo history, Transpose, Slide, Length, Retrograde, and Velocity Scale. Fit to Time resizes the MIDI + Audio events so that they run to a specified time; and Fit to Improvisation analyses the timing of improvised MIDI events, applies a tempo map and displays the results as regular bars and beats; surprisingly, though, *Cakewalk* lacks a Delete Doubles tool to locate and remove duplicated MIDI events. The Lyric view editor, as its name implies, allows you to write and edit song lyrics; it will also perform as an autocue, scrolling lyrics on your PC monitor during playback. The quantisation options could do with refining: there's no record auto quantise function, and the editing options are not as easy to use as those in *Cubase* — but you can now save your settings as presets, and audio events can be quantised by start position or by length, or both.

Similar in appearance and behaviour to the Piano Roll view, the Drum editor displays a list of drum voices in place of the piano keyboard; notes appear as diamond-shaped icons. Drum editing is limited — it's not possible to mix and match drum voices from devices on different ports to create custom kits and edit them on a single screen; nor can you remap drum notes and arrange them as required on a single keyboard; and there is no



windows — including Quantize, Groove Quantize, Interpolate, the Event Filter, Remove Silence, Extract Timing, Pitch Detection, Graphic EQ, Parametric EQ, DirectX plug-ins and CFX — now include a Save Preset function.

Accessing the editors is easy: right-clicking on the track or Clip summons a pop-up menu containing the editors list — alternatively, you can choose your editor from the View menu. Most



Cakewalk relies on multiple windows for much of its editing power.

way to Solo or Mute voices and so enable individual drums or groups of drums to be auditioned in isolation. It would also be helpful if you were able to add a velocity level offset to individual drum voices. However, one consolation is that *Cakewalk Pro Audio 6's* Staff view now displays and prints percussion notation.

VIEWS

The Event list view is a simple text-based list editor that provides the Track, Start Time, Channel, Event Type and Parameter Value details of MIDI + Audio events. A tad more editing power would not go amiss in the Event list editor: although you can give different event types their own colour to make them easier to spot in the list, it's not possible to mask events by type either from the list display or from edit moves — a View Event type of filter would solve this problem. Another niggle is that the Edit list only shows audio event lengths in samples, when time and meter values would be considerably more useful.

Although not up to the full rigours of DTP score production, *Cakewalk's* Staff view is a good basic score editor that is capable of displaying and printing up to 24 staves of notation with expression and dynamics markings, lyrics, production credits and performance advice. Guitar-chord tablature and drum notation are included, and the Track Key+ function makes provision for transposing instruments

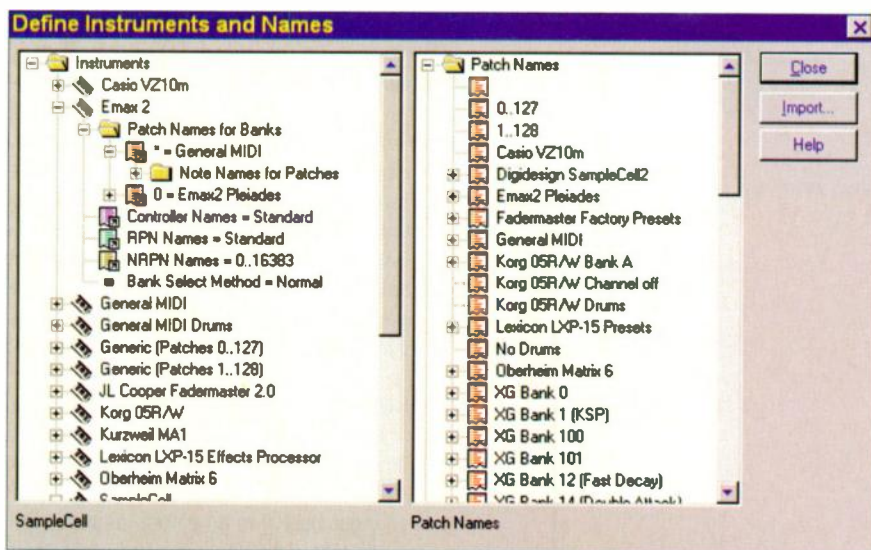
CONTROLLERS

MIDI Controllers not only define many of the expressive qualities of a MIDI musical performance but are also used extensively in studio automation routines; although *Cakewalk* copes with most controller editing tasks, it continues to be unwieldy and under-specified in certain critical areas. *Pro Audio 6* integrates the Controllers view into the old Piano Roll velocity pane — controller events are selected by type and channel, and are displayed as vertical columns which can be edited using the draw tools, but only a single controller type can be viewed at any one time unless you resort to opening multiple windows. The Controller pane does not have a 'force channel display' option, so you can only edit controller data from one channel at a time, which can make editing tricky if events originated on different MIDI channels. It is possible to remap controller data once it's recorded into *Cakewalk*, but there's no facility to do this in real time, to let you, for example, record MIDI volume from the modulation wheel.

AUDIO

Audio is recorded directly into *Cakewalk* at the default sample rate of 44.1kHz; the default audio track format is mono, but the software will recognise as stereo a pair of consecutive tracks, the first of which has a pan value of 0, the second with a pan value of 127. Re-ordering the tracks or changing pan values will cause *Cakewalk* to treat the tracks as mono. You can import 16-bit WAV

format soundfiles by dragging and dropping them onto the Clips pane from the Windows 95 Explorer, or by selecting the file from the Insert menu Wavefile item. If you use 8-bit audio files, they can only be added in the Event editor as Windows MCI events. Importing audio is very slow compared with other applications — a 40.6Mb stereo audio file takes one minute and 50 seconds to load into *Cakewalk*, compared with less than 34 seconds in both *Cubase Audio XT3* and *Sound*



Forge 4. However, once the audio is saved as part of a *Cakewalk* song, subsequent loads are near instantaneous, although if you're running a large number of audio tracks load times may be longer, as *Cakewalk* appears to recalculate the graphic waveform data each time it loads a file.

Soundfiles with sample rates of 11kHz, 22kHz, 44.1kHz or 48kHz may be used, but the same sample rate must be effective throughout the song unless your audio recording hardware specifically permits otherwise. *Cakewalk* features improved audio metering with peak hold, but still only monitors soundcard activity and not individual tracks. Clipping caused by digital overload can be prevented by activating the 'Clip audio mix on overflow' feature in the Settings for Advanced Audio Options, but this places an extra burden on the CPU and may affect performance adversely. Setting up for recording audio is very quick, and this makes *Cakewalk* an ideal songwriting tool — you don't even have to name the soundfiles you've recorded unless you need to export them for use in another application.

Probably the most remarkable aspect of *Cakewalk Pro Audio 6* is the extent to which audio events can be edited with a degree of control that up to now has been associated with MIDI. During playback, audio events respond to MIDI controller volume and pan messages; audio can be quantised, used in linked Clips, or even time-stretched or pitch-shifted just like MIDI events. To produce a smooth response to MIDI controllers, you should enable Low Latency Mixing in the

Instrument Definitions: an elegant and simple database in which you can store the bank, voice and note information for your MIDI instruments.

PC REQUIREMENTS

The reference PC is an Intel Pentium 200 with VX motherboard, 256K pipeline burst cache, 48Mb RAM, Turtle Beach Pinnacle and Creamware TripleDAT soundcards, and a 2Mb Trio+ PCI graphics running 1024 x 768 with 64,000 colours on a 17-inch monitor. *Cakewalk Music Systems* recommend a P120, 32Mb RAM, but a faster processor would be preferable if you intend to run third-party DirectX plug-ins.

CAKEWALK PRO AUDIO 6

- ▶ Audio Options dialogue box; *Cakewalk* features improved audio pan and volume handling and now follows a linear dB scale of -90dB to +18dB.

AUDIO EDITOR

Cakewalk's Audio editor provides true sample-level accurate editing, and features cut and paste editing tools together with a good selection of off-line DSP-type functions. These include normalise; a 10-band graphic EQ; a parametric EQ with high-pass, low-pass, peak and notch filters; a noise gate; and fade and crossfade with custom envelope editing. Additionally, any DirectX plug-in effects — including *Cakewalk's* own CFX — can be applied off-line from the Audio editor, and all effects can be auditioned prior to processing. The Audio editor can display multiple tracks, and the right mouse menu also contains Remove Silence, which is used to mute audio that lies below a set threshold level, and is invaluable for stripping out background noise in the quiet passages between sections in voice-over or vocal recordings; Pitch Detection, an Audio-to-MIDI melodic analysis facility that creates MIDI-note and pitch-bend events from a single-line mono soundfile; and Extract Timing, which analyses rhythmic audio material and creates MIDI notes and tempo changes based on amplitude peaks in the audio material. The nuances of accent and timing that define the groove are preserved and can be used to create a Groove Quantise pattern, which can be applied to MIDI tracks to make them mimic the feel of the audio.

REAL-TIME EFFECTS

Cakewalk Pro Audio 6 combines ingenious software DSP emulation and the power of the Pentium processor to not only play back discrete multiple tracks of digital audio but also to apply non-destructive real-time effects processing to the audio material. You apply audio effects by opening the Effects View and dragging effects from the Effects list, either to the Track Inserts (to add effects to individual tracks), or to one of the four Effects Loops (to add effects to a group of tracks). Effects may be chained together and Effects Loops (consisting of a mono send and a stereo return) may be configured as either pre- or post-fader. All four Effects Loops can be used simultaneously and respond to MIDI channels 1-4: MIDI Controller 91 defines the send level, and Controllers 92 and 93 set the return level and the return Pan position.

Six onboard CFX modules ship with *Cakewalk Pro Audio 6* — chorus, reverb, delay, EQ, flanger and time/pitch stretch — and these can be used with third-party DirectX plug-ins. To an extent, CFX sacrifices depth of control for increased simplicity of use: the editing parameters are relatively simple but the effects themselves are generally very useable. The CFX Reverb is warm and avoids the horrid metallic quality that frequently spoils budget

processors (it reminds me of my old Alesis Microverb II); the Chorus sounds sweet; the Flanger has a pleasant harmonic richness, and the Delay/Echo is of a similar high quality. The only disappointments are the under-specified CFX 2-band EQ, and the Time/Pitch Stretch, which could only cope with very simple material. Although effects can be auditioned, CFX are not equipped with a bypass switch to enable A-to-B, wet-to-dry comparison, nor can you solo the track from the CFX panel; but these omissions don't lessen the thrill of being able to add effects to audio tracks and edit the parameters during playback.

PANEL VIEW

Studioware provides desktop control of external hardware such as hard disk audio recorders, MIDI instruments, mixing consoles and effects processors, to enable a high level of mix automation. *Cakewalk* includes simple panels for the Roland VS880, Roland SC88, Tascam DA38, Yamaha MU80, Yamaha ProMix 01, Digidesign Session 8 and Mackie OTTOMix 1604; more *Studioware* will be available free of charge to registered users at www.cakewalk.com. There is incredible potential in Panels and they represent a quantum leap forward from the old *Cakewalk* Faders view — but *Studioware* is rightly described as an advanced user area, and creating panels for your own MIDI gear could be a long process because of the complexity of modern equipment. But patience and practice will bring rich rewards...

CONCLUSION

Cakewalk Pro Audio 6 is, quite simply, an awesome music production powerhouse, and it comes closer than any other single PC application ever has to providing an all-in-one software multitrack MIDI + Audio recording and editing solution for the contemporary PC-based studio. In the limited period allowed for this review, *Cakewalk Pro Audio 6* constantly amazed and delighted me, and I'm aware that I've only been able to scrape the surface of some of the colossal wealth of features on offer — this is a wonderful piece of software. Once again: well done Cakewalk!

SO

Thanks to Charlie Griffiths for invaluable additional research.

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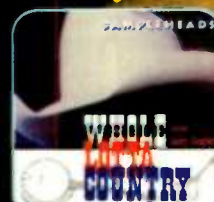
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FACE

MIDI INTERFACES FOR THE PC

Now that the MIDI outputs of many soundcards are already occupied by playing back high-quality internal

synth sounds and multi-channel samples, many musicians are finding that they need to invest in a more comprehensive MIDI interface to service the rest of their synths.

MARTIN WALKER provides a little background.

The history of PC MIDI interfaces is rich and varied, and not without its share of problems. Back in the 1980s, when the Windows operating system was still a twinkle in some designer's eye, the only music sequencers available ran in DOS, and each supported only a few specific models of MIDI interface. Thankfully, one model — the Roland MPU401 — attracted more support than any other, and this became the basic standard specification on which other later devices were based, making it far easier to ensure that your interface would work with all models of sequencer. When the early soundcards started to sprout onboard MIDI interfaces as well, they initially used a different (and rather cut-down) interface standard, which became known as SoundBlaster MIDI. Although perfectly adequate for simple sequencing use, these early soundcard interfaces were not really capable of more data-intensive jobs, such as sending and receiving large SysEx dumps.

As more advanced soundcards evolved, one of the selling features to differentiate them from early devices became the phrase 'MPU401-compatible', and many soundcards and stand-alone interfaces are still based on this standard today. However, if you currently use an interface that's more than a few years old with a new Pentium machine, you may find that it struggles to keep up, as it was never designed for the much higher speeds of today's motherboards. If you occasionally suffer from glitches (missed or hanging notes, or unreliable SysEx dumps), it may not be the drivers at fault; it may be time to buy an interface that can cope with any speed of PC. Don't forget that if you only need a single MIDI In and Out, it may be more

cost-effective to buy a complete soundcard which incorporates these (Time & Space market the Terratec SoundSystem Base 1, which retails at an amazing £34.99 including VAT!).

All modern PC MIDI interfaces will be provided with a set of Windows 95 (and probably also Windows 3.1) drivers. The standardised approach of Windows ensures that a new interface simply appears as one or more additional entries in the list of installed Windows 95 MIDI devices, and is therefore available to any Windows sequencer.

VALUE

MULTIPLE OUTS & INS

As musicians demanded higher and higher performance from their PCs, the restrictions of only having one In and one Out with an MPU401-style interface became increasingly difficult to work round (see 'Shared Ports' box). A multi-output interface removes this restriction, by providing a separate 16 channels of MIDI on each output; sequencing is much easier when you have a different output socket to feed each synth. It also reduces the possibility of occasional glitches when carrying large amounts of controller data, by distributing the total work-load between several outputs. Incidentally, there are interfaces available that feature several output sockets fed from the same 16 channels — these are not multi-port devices, but they do make connecting synths easier than using a daisy-chain of leads. To determine the actual number of separate outputs, look for the total number of available MIDI channels. For instance, a device having four outputs with a total of 32 MIDI channels is providing two separate MIDI outs, each featuring 16 channels, and each feeding a pair of identical sockets.

On the input side, normally a master keyboard will only be sending on a single channel, when transmitting MIDI data to the interface input. If you play MIDI guitar, this may send on six channels simultaneously (or four for MIDI bass guitar), to allow pitch-bend on individual strings. All this data can still be sent to a single MIDI In. However, if you need to record several musicians simultaneously, it's safer to send each performance to a separate MIDI input, since any performance is likely to generate a lot of controller information, as well as note data. As long as the sequencer allows it, recording as multiple streams on different tracks will minimise the possibility of lost performance data.

OUT-OF-BOX EXPERIENCES

Once you've decided how many inputs and outputs you need (allowing for some expansion potential too), the other main choice is whether to go for an internal or external device. Most of the

early PC interfaces came as plug-in cards, but MIDI interfaces which plug into the PC serial or parallel ports are increasingly being marketed. One of the big benefits of this approach to the designer is that the same hardware can be used with both Mac and PC devices, with the addition of two sets of driver software, but there are also a couple of advantages to the user. First, you don't need to open up your PC to install an expansion card, which is a real time-saver; second, external interfaces don't need additional IRQs (Interrupt Requests) to operate — they simply use the one already allocated to the appropriate PC port. This makes setting up a lot easier, and if your PC is already quite full, finding a free IRQ can be difficult, even if you still have a spare card slot of the appropriate variety.

If you go for an external interface box, those which draw their power from the PC may be slightly cheaper than those with separate or built-in power supplies, and this does mean that there's one less wall wart to contend with. However, the self-powered type can be useful if you don't always want to boot up your computer before playing music — most should allow you to at least pass MIDI data from input 1 to output 1, so that you can use your keyboard to play something else, and those with integral MIDI patchbay functions will allow many other options. When you do want your sequencer on-line, make sure that the self-powered interface is switched on before booting up your computer — some Windows drivers search for connected hardware, and the interface or driver may not be initialised correctly if it is not found. In general, you should always boot up external devices first anyway, switching on the computer last of all, so that all devices are up and running for the computer to recognise.

A FINE OLD PORT

If you choose an external device, designs are available that plug into either the serial or parallel ports (and Et Cetera are shortly to launch a model that will work with either). Don't try to plug a serial-type interface into the COM port already running a mouse, since they will interfere with each other. It is better to use a COM port that is either currently unused, or the one with a modem attached, as you are less likely to run both of these at once.

In the case of both serial and parallel port devices, check that they provide a through-port if you need to reconnect another device to the same port (not all do, but you can still buy splitter or switch leads to achieve the same end). As always for musicians, there are potential conflicts with any dongles that may already be hanging off your external ports. For obvious reasons, no-one will say just what exactly is inside each of these 'piracy busters', and although I have never personally experienced any problems, that doesn't mean you won't. Also, watch out for parallel interfaces which claim 'concurrent printing' (simultaneous with MIDI usage). Sometimes these can degrade both MIDI and printer performance. The better alternative is to buy one with non-concurrent printing and MIDI. This allows both to be optimised when used alone, but may slow things down if you attempt both simultaneously. Still,

how many people want to use the printer port and play music at the same time?

To provide both MIDI In and MIDI Out, a parallel port needs to be bi-directional. Nearly all modern PCs will have various modes that can be set from the BIOS, including SPP (Standard Parallel port), EPP (Enhanced Parallel Port, which is capable of transferring data at between 500Kb and 2Mb per second), and ECP (Extended Capability Port, which is similar to EPP, but uses DMA to move large blocks of data). You may need to adjust your port type to run a parallel-port MIDI interface, but this is normally fairly easy to do, and comprehensive instructions will be provided by the interface manufacturer.

SYNC OR SWIM

Once you get beyond multiple inputs and outputs, you enter the heady world of synchronisation. If you need to lock your MIDI sequences to SMPTE, ADAT, Word Clock, S/PDIF, Sony 9-pin video decks or MIDI Machine control, there's a unit available to assist you. At the higher end, devices like the new MOTU Digital Timepiece directly support ADAT sync, and this can save you having to spend a lot of money on additional sync units, as you can lock all of your boxes to sample accuracy. Many higher-priced models also feature MIDI patchbays, and this can save you wasting an awful lot of time in re-patching to send SysEx data to each attached device. At this sort of level it's wise to read some of the individual comprehensive reviews in SOS, as the applications of this kind of unit are practically endless. However, more than anything else, don't scrimp on outputs — decide how many you currently need, and then double it. There's no point in centralising your MIDI system, only to find you need to buy a second unit in a year's time!

EES

PC-MIDI 1/4

Cimple Solutions (whose repairs and servicing have helped many a muso), have now taken on the marketing of a PC MIDI interface from EES. It's an external unit that plugs into the parallel port, and provides four independent outputs and a single input. Unusually, it also has an on-board mains power supply, so that no power is taken from the PC port, and this also means that you can use the interface (MIDI In to MIDI Out 1) without powering up your PC. To help the printer and



TEETHING TROUBLES

Both the multi-port interface and the serial type had some reliability problems in the past with slower PCs. So much so, in fact, that a few years ago it was wise to check with your sequencer manufacturer, before purchase, that a particular model of interface was supported. The problems often occurred when receiving large banks of data, since the rate at which they were sent was set by the synth, and not by the PC. Transmitting data of this type from the PC to external MIDI synths was rarely a problem, as the sequencer or editor

could ensure that all data emerged at a steady and reliable rate. My old 486 machine locked up completely when attempting to receive an SDS dump with a standard MPU401 interface, but my new 166MHz machine worked fine with the same interface. Another problem area was that some badly written drivers did not release the port after use, so that the next time you needed to use it, you had to reboot the PC completely. Nowadays, most drivers are more thoroughly debugged (famous last words!), and most people not only have much higher speed PCs, but also buffers on the serial ports which ensure that no data is missed.

MIDI INTERFACES FOR THE MAC

MIDI CABLES FOR PC SOUND CARDS

If you already have a PC soundcard, the chances are that it will feature an onboard MIDI interface, needing only an adaptor lead to convert the 15-pin 'D'-type connector to a pair of MIDI connectors. Various companies (including soundcard manufacturers) make these, and nearly all conform to the same standard, so the same lead can be used with most soundcards. The ones featured below include a through-port to allow you to connect a joystick for games use as well. The more expensive ones tend to have a connector box with MIDI sockets, while the cheaper ones feature long leads ending in MIDI plugs, or captive MIDI sockets on shorter ones.

Here's a selection to choose from:

- BCK (01992 524442) DPMD soundcard-plug-to-MIDI (1.2 metres, male): £14.99.
- Et Cetera MIDI cable adaptor (2 metres, male): £24.
- MIDIMAN soundcard MIDI cable (1.2 metres, male or 30cm, female): £24.95.
- Opcode soundcard translator cable (15-pin, 'D'-type): £19.

MIDI solutions

Professional MIDI products for your PC



► MIDI interface co-exist, the first byte sent to the printer disables the interface, and a small utility (EES reset) is provided to re-enable MIDI after printer use. Drivers are supplied, and updated multi-client versions are expected by the time you read this.

- 1 In, 4 Outs.
- Parallel port connection.
- Printer through-port.
- ABS casing.
- Built-in mains power supply.
- £99 including VAT.

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T 0181 904 4141.
F 0181 904 1200.
E service@cimplesolutions.demon.co.uk
W <http://www.cimplesolutions.demon.co.uk>

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MIDI EDGE

The MIDI Edge range is marketed by Et Cetera, who have a long association with all PC music matters, as well as a good reputation for supplying reliable products. As mentioned earlier, they also plan to shortly introduce an interface with even more outputs, which can connect to either the serial or parallel port.

MIDI EDGE 1x1

This is an affordable 1-in, 1-out ISA card that fits inside the PC. It also features a WaveBlaster-compatible daughterboard connector, although this will use the same 16 output channels as the main out. It's compatible with the Roland MPU401 standard, and so will use standard Win 3.1 or Windows 95 drivers. This is the cheapest model to feature a WaveBlaster connector.

- 1 In, 1 Out.
- WaveBlaster connector.
- 1/3-length ISA card.
- Choice of four IRQ settings.
- £59 including VAT.

MIDLINK

This unit is a marvel of miniaturisation, and connects to either of the PC serial ports, although you should not attach it to the one connected to your mouse. It also draws its power from the port, only taking about the same as a mouse.

- 1 In, 1 Out.
- Serial port connection.
- Powered by PC.
- £69 including VAT.

MIDI EDGE 1x4

As its name suggests, this model is based on the 1x1, but with four outputs. As it's also equipped with a daughterboard connector, this could form the basis of a fairly comprehensive MIDI setup, as long as you don't need sync features. It comes

complete with multi-client drivers (for both Windows 3.1 and Windows 95), which also allow the use of two MIDI Edge 1x4 cards in the same machine, giving a total of eight independent MIDI outputs, or 128 MIDI channels for playback, and 32 channels for recording!

- 1 In, 4 Outs.
- Multi-client drivers.
- WaveBlaster connector.
- Half-length ISA card.
- Choice of six IRQ settings.
- £129 including VAT.

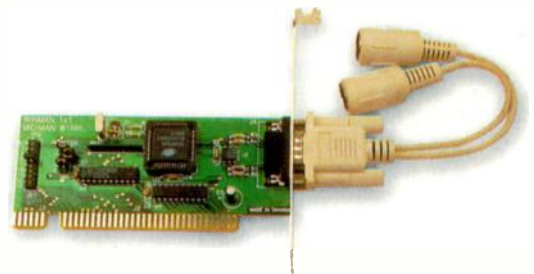
A Et Cetera, Valley House, 2 Bradwood Court, St. Crispin Way, Haslingden, Lancs BB4 4PW.
T 01706 228039.
F 01706 222989.
W <http://www.etcetera.co.uk>

info

MIDIMAN

WINMAN 1x1

This unit is claimed to be the world's least expensive interface, and can be assigned to any of ten interrupts (six more than the MPU401), which may make things easier if you already have plenty of other cards in your PC. However, this sort of claim is asking for competition, and the MusicQuest PC MIDI Card II (see below) now matches it for price.



- 1 In, 1 Out.
- 1/3 length ISA card.
- Choice of 10 IRQ settings.
- £49 including VAT.

MM401

If this sounds familiar, think of Roland. Yes, it's another MPU401 clone, and none the worse for it. It's a 1/3-size ISA card, and so should fit into any slot, whatever obstructions bar the use of longer ones. Once again, it can use the standard MPU401 Windows drivers.

- 1 In, 1 Out.
- 1/3-length ISA card.
- Choice of four IRQ settings.
- £59 including VAT.

PORTMAN PC/S

This is a basic 1-in/1-out interface that attaches to a serial port. All the Portman range features 'smart buffering', which should ensure that there's no overrun when performing large SysEx dumps, even on slower PCs. They are parasitically powered by ►

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Hugh Robjohns - Sound on Sound, February 1997.

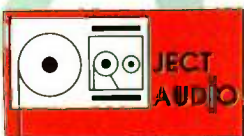
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Anthony Timson - Audio Media, February 1997

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MIDI INTERFACES FOR THE MAC



▶ the PC, and so need no power supply, and also feature strong steel construction. In addition, they have sockets for a 9V wall wart, just in case you have a rare portable PC that doesn't provide any power down its parallel port. Sounds bomb-proof to me!

- 1 In, 1 Out.
- Serial port connection.
- Steel casing.
- Normally powered by PC.
- £69 including VAT.

WINMAN 2x2

Another step up from the Winman 1x1, this, as its name suggests, gives you two of everything.

- 2 Ins, 2 Outs.
- 1/2-length ISA card.
- Choice of 10 IRQ settings.
- £79 including VAT.

PORTMAN PC/P

This is the parallel port version of the PC/S, and is otherwise identical.

- 1 In, 1 Out.
- Parallel port connection.
- Steel casing.
- Normally powered by PC.
- £89 including VAT.

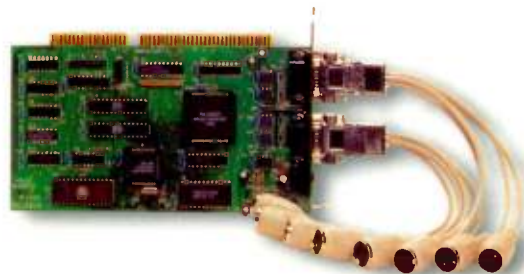
PORTMAN 2x4

This is another parallel port device, but it features two ins and four outs, as well as its own separate power supply.

- 2 Ins, 4 Outs.
- Parallel port connection.
- Steel casing.
- Powered by supplied PSU.
- £129 including VAT.

WINMAN 4x4/S

The 4x4/S is a comprehensive beast. Not only does it have four independent ins and outs, but it also features SMPTE sync, and an internal PC MIDI patchbay. It reads, writes and regenerates SMPTE from "even the worst SMPTE timecode", and features all the normal frame formats including 25, 29.97 and 30 drop or non-



drop LTC. The supplied multi-client 32-bit software works with both Windows 3.1 and Windows 95.

- 4 Ins, 4 Outs.
- Supports all SMPTE timecodes.
- MIDI patchbay.
- Multi-client drivers.
- 2/3-length ISA card.
- Choice of 10 IRQ settings.
- £219 including VAT.



PORTMAN 4x4/5

The final model from MIDIMan is the external parallel port version of the Winman 4x4/S. This will also function when disconnected from the PC, operating as a stand-alone MIDI patchbay, using MIDI program changes to select patches.

- 4 Ins, 4 Outs.
- Supports all SMPTE timecodes.
- MIDI patchbay.
- Multi-client drivers.
- Parallel port connection.
- Steel casing.
- Powered by supplied PSU.
- £249 including VAT.



MULTIPLE CONFUSION

All MIDI interfaces will be supplied with driver software, but this can be of several types, and it's worth explaining the difference between them. There's still much confusion about what constitutes a multi-client driver. Although it is possible for a single driver, that will run multiple MIDI ports, to be supplied, the musician's overriding need is for multiple programs to be able to access a single MIDI device. Here are definitions of the three types of 'multi' driver:

• **MULTI-CLIENT:** This is a driver for a single port (such as MIDI) that allows several programs to access it simultaneously — a sequencer and an editor, for example. Both the MIDI input and/or

output may be multi-client. This interactive capability greatly aids the musician, by allowing you (for example) to change sounds in real time using a synth editor, while simultaneously playing back a sequence using another application.

• **MULTI-PORT:** This is a single driver that can send signals to several separate ports on a single interface — each port will feature an additional 16 MIDI channels. An example of this is the MIDI Edge 1x4 interface, which has four independent MIDI outputs on a single card. Although this is extremely valuable, if each also has multi-client capability (as seems to be the case) that's really the icing on the cake. The other huge advantage of this type of interface is that the driver will normally only use a single interrupt — even for an 8-in/8-out device!

• **MULTI-CARD:** The latest breed of soundcards sometimes come with drivers that are capable of controlling several other cards of the same type. Due to the often acute shortage of DMAs and IRQs in the average PC, a single driver that can run several pieces of hardware is welcome news indeed. The MIDI Edge 1x4 drivers can run two of these cards, and drivers are available for some Turtle Beach soundcards that will allow up to four cards to run from a single driver, giving multiple inputs and outputs. Although each card will probably use additional resources, designing drivers in this way will streamline processor overhead and minimise system conflicts. The alternative (trying to run up to four copies of the same driver, each with different settings) does not bear thinking about!

A Midiman, Hubberts Bridge House,
Hubberts Bridge, Boston, Lincolnshire
PE20 3EU.

T 01205 290680.

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E 106133.2372@compuserve.com

W <http://www.midifarm.com/midiman>

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MARK OF THE UNICORN

MOTU, as reported in the Mac MIDI interface round-up last month, have revamped their range of interfaces. Since they are all external devices, many models can be used by both Mac and PC, and so have already been covered in more detail in our July issue.

PC-MIDI FLYER

This is the only uniquely PC interface in the MOTU range, and I reviewed it in the December 1996 issue of SOS. Useful LEDs that show activity on each input and output are provided, and a computer bypass switch allows you to use the interface as a Thru box when the PC is not powered up. The main downside is that no through-port is provided, so you'll need a switching box if you want your printer connected as well.

- 2 Ins, 2 Outs.
- Parallel port connection.
- Steel casing.
- Normally powered by PC.
- £99 including VAT.

POCKET EXPRESS

(See Mac roundup, last month.)

- 2 Ins, 4 Outs.

- Supports all SMPTE timecodes.
- Parallel port connection.
- Steel casing.
- Powered by supplied PSU.
- £165 including VAT.

MICRO EXPRESS

(See Mac roundup, last month.)

- 4 Ins, 6 Outs.
- Supports all SMPTE timecodes.
- Parallel port connection.



- Half rack-width steel casing.
- Powered by internal PSU.
- £299 including VAT.

MIDI EXPRESS XT

(See Mac roundup, last month.)

- 8 Ins, 9 Outs.
- Supports all SMPTE timecodes.



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MIDI INTERFACES FOR THE MAC



- ▶ • Parallel port connection (PC).
- Serial port connection (Mac).
- 1U rackmounting case.
- Powered by internal PSU.
- £399 including VAT.

MIDI TIMEPIECE AV

(See Mac round-up, last month.)

For professional use, this not only has a large complement of MIDI Ins and Outs, but also features a MIDI patchbay, SMPTE-to-MIDI converter, and a digital audio/video synchroniser. For PC use, two units can be connected to a single machine, which would give a total of 16 Ins and 16 Outs, but this would give problems with the infamous Windows 95 device limit (see this month's PC Notes). This model received a more extensive review in the January '97 issue, and with such a comprehensive spec, it would be wise to study it thoroughly to appreciate just what is possible.

- 8 Ins, 8 Outs.
- Supports all SMPTE timecodes.
- MIDI patchbay.
- Parallel port connection (PC).
- Serial port connection (Mac).
- 1U rackmounting case.
- Powered by internal PSU.
- £649 including VAT.

“...more than anything else, don't scrimp on outputs — decide how many you currently need, and then double it.”

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SHARED PORTS

In the case of monophonic analogue synths, as well as newer physical modelling devices such as the Korg Prophecy, only a single MIDI channel is needed for each. If you have several MIDI synths of this sort, you can share a single Out between them. In the case of multitimbral synths, although people rarely need to use all 16

available channels on each device, sharing MIDI output ports between several synths needs some forethought. Any note data sent on one channel of the shared port will produce sounds on the same channel from each connected synth, unless you can disable specific channels on all but the desired one. Even reducing channel volume on the other devices to zero, so that only one sound can

be heard, will still tie up some of the polyphony (total number of notes available) of the others, since the notes will still be activated, despite not being heard. Some synths allow you to disable selected channels with a SysEx command, but setting up a well thought-out shared system can involve you in a lot of head scratching. If you can afford a multi-port interface, go for it!

OPCODE

Distribution of the Opcode range has been taken over by SCV since our Mac round-up last issue, so the contact details have changed. As well as having their own range, Opcode took over MusicQuest about a year ago, so this PC range has been added to the Opcode stable. MusicQuest have been making PC interfaces since 1987, so their product range draws on a lot of experience.

MUSICQUEST PC MIDI CARD II

This is another MPU401 clone, this time with a multi-client driver (this beats the standard Windows 95 one!). With seven IRQ settings, including 10, 11, and



12, this one also beats many other clones that only have access to interrupts up to IRQ7, and may be just what you need to fit in an already packed PC.

- 1 In, 1 Out.
- Multi-client drivers.
- 1/2-length ISA card.
- Choice of seven IRQ settings.
- £49 including VAT.

OPCODE MIDI TRANSLATOR PC

This is a small cigarette pack-sized box, which features two Ins and two Outs. It connects to the parallel port, and, at £99, seems to be a direct competitor for the PC-MIDI Flyer from MOTU. However, it also has a novel docking feature — you can attach further units, up to a maximum of four, creating a monster 8-In/8-Out system! Although a power adaptor is not required for a single unit, one is provided for the through-port and docking features. LED readouts are also provided for MIDI In, Out and power (although I

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MIDI INTERFACES FOR THE MAC



► doubt that many people will be able to see these, as the Translator should slip neatly behind your PC).

- 2 Ins, 2 Outs.
- Multi-client drivers.
- Parallel port connection.
- Printer through-port provided.
- Plastic casing.
- Normally powered by PC.
- £99 including VAT.

MUSICQUEST MQX32M

This is effectively a double MPU401 clone with additional SMPTE and chase lock support.

- 2 Ins, 2 Outs.
- Multi-client drivers.
- Supports all SMPTE timecodes.
- 1/2-length ISA card.
- £199 including VAT.

MUSICQUEST MIDI ENGINE 2 PORT/SE

This is another well-specified unit, from the rugged steel casing, to the "deep FIFO buffering" on all inputs and outputs (for ultra-reliable SysEx use).

It will sync to and generate all forms of SMPTE, as well as regenerating dodgy sync tracks.

- 2 Ins, 2 Outs.
- Multi-client drivers.
- Supports all SMPTE timecodes.
- Parallel port connection.
- Printer through-port provided.
- Steel casing.
- Powered by supplied PSU.
- £159 including VAT.

OPCODE STUDIO 64x

(See Mac round-up, last month.)

The Studio 64X auto-detects the presence of a Mac or PC (and can connect to both at the same time!), and provides a more than comprehensive selection of features.

- 4 Ins, 6 Outs.
- Supports all SMPTE timecodes.
- MIDI patchbay.
- Parallel port connection (PC).
- Serial port connection (Mac).
- Printer through-port provided.
- 1U rackmounting case.
- Powered by supplied PSU.
- £259 including VAT.

MUSICQUEST MIDI ENGINE 8PORT/SE

If you thought the 2Port/SE was your cup of tea, the 8-port version should have you drooling. Four times as many buffered Ins and Outs are featured, as well as the SMPTE features, but this time a MIDI patchbay is also provided, which can operate

independently of the PC, giving eight user programs, in non-volatile memory, chosen via a front-panel switch. With the PC powered up, you can take advantage of the Windows patchbay program, loading and saving user programs. MIDI message and channel filtering are provided — so you can finally get rid of those active sensing messages that emerge from some keyboards! Front-panel LEDs monitor MIDI activity, which can be a great help in tracking down problem MIDI devices.

- 8 Ins, 8 Outs.
- Multi-client drivers.
- Supports all SMPTE timecodes.
- MIDI patchbay.
- Parallel port connection.
- 1U rackmounting case.
- Powered by supplied PSU.
- £399 including VAT.



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MPU401 AT

This is the granddaddy of them all, albeit in a new guise, complete with daughterboard connector. I still have an earlier model of this card inside my own PC, but this one is extremely compact — it should fit in any card slot. At £69, it costs £10 more than the MIDI Edge 1x1 with the same spec, but it does have a good pedigree. The only



non-standard feature is that mini-DIN sockets are used, although the appropriate cables are included.

- 1 In, 1 Out.
- WaveBlaster connector.
- 1/3-length ISA card.
- Choice of 6 IRQ settings.
- £69 including VAT.

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INTRODUCING THE HR824 ACTIVE MONITOR.

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

SCIENCE, NOT SNAKE OIL.

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

FLAT RESPONSE... ON OR OFF-AXIS.

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

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



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

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



Like biamplified speakers, wave guides aren't a new concept. But it takes optimized internal electronics

and a systems approach to make them work in near-field applications.

The HR824's wave guide (Fig. B) maximizes dispersion, time aligns the acoustic center of the HF transducer to the LF transducer's center, and avoids enclosure diffraction (notice that the monitor's face is perfectly smooth.) The exponential guide also increases low treble sensitivity, enabling the HF transducer to handle more power and produce flat response at high SPLs.



CLEAN, ARTICULATED BASS.

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

First, the HR824's FR Series 150-watt bass amplifier is directly coupled in a servo loop to the 8.75-inch mineral-filled polypropylene low frequency transducer.

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

Second, the HR824's low frequency driver is coupled to a pair of aluminum mass-loaded, acoustic-insulated 6.5-inch passive drivers. These ultra-rigid drivers eliminate problems like vent noise, power compression, and low frequency distortion — and couple much more effectively with the control room's air mass. They achieve the equivalent radiating area of a 12-inch woofer cone, allowing the HR824 to deliver FLAT response to 42Hz with a 38Hz, 3dB-down point.

Third, the woofer enclosure is air-displaced with high-density adiabatic foam. It damps internal midrange reflections so they can't bleed back through the LF trans-

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

A TRUE PISTONIC HIGH-FREQUENCY RADIATOR.

We scoured the earth for the finest high frequency transducers and then subjected them to rigorous evaluation. One test, scanning laser vibrometry, gives a true picture of surface vibration patterns. Two test results are shown in



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

the upper right hand corner of this ad. Figure C is a conventional fabric dome tweeter in motion. You needn't be an acoustic engineer to see that the dome is NOT behaving as a true piston.

Figure D shows our High Resolution metal alloy dome at the same frequency. It acts as a rigid piston up to 22kHz, delivering pristine, uncolored treble output that reproduces exactly what you're recording.

INDIVIDUALLY OPTIMIZED.

We precisely match each transducer's actual output via electronic adjustments. During final assembly, each HR824 is carefully hand-trimmed to ± 1.5 dB, 42Hz-20kHz. As proof, each monitor comes certified with its own serialized, guaranteed frequency response printout.

The HR824's front board has "radiused" edges to further eliminate diffraction; an "H" brace bisects the enclosure for extra rigidity.



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



Fig. D: HR824 alloy dome's uniform, accurate pistonic motion.

Mackie is one of the few active monitor manufacturers that also has experience building stand-alone professional power amps. Our HR824 employs two smaller versions of our FR Series M-1200 power amplifier — 100 watts (with 150W bursts) for high frequencies, and 150 watts (200W peak output) for low frequencies. Both amps make use of high-speed, latch-proof Fast Recovery design using extremely low negative feedback.

TAILOR THEM TO YOUR SPACE.

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

CONFRONT REALITY AT YOUR MACKIE DESIGNS DEALER.

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

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

If you've priced other 2-way active monitors, you're going to love the HR824's price AND its accuracy.



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

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

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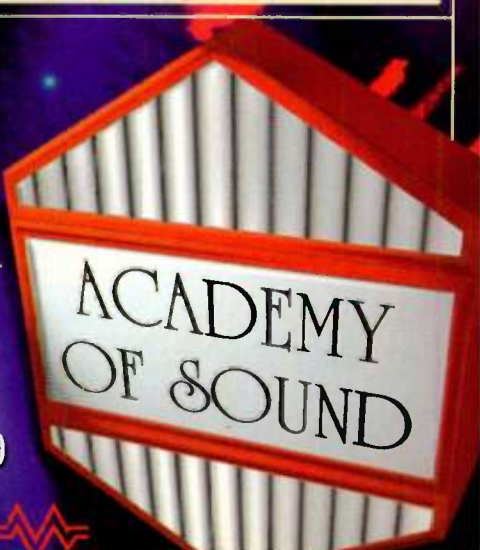
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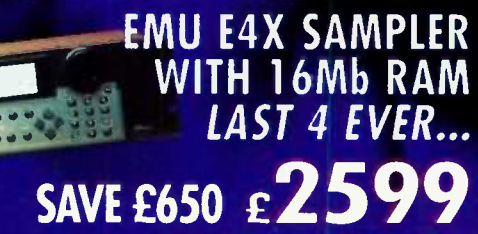
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Sonic Surgery

NON-LINEAR AUDIO RESTORATION ON THE PC

Almost every recording musician has a great take somewhere that's unrepeatable and marred by hiss, hum or other audio gremlins. Wouldn't it be great if there was some affordable way of restoring such a recording to its former glory? JANET HARNIMAN COOK discovers that there is...

Audio renovation was, until recently, the domain of expensive high-end systems such as those from Cedar and Sonic Solutions, but the last year or so has seen the introduction of high-quality budget audio restoration software for the PC, most notably as plug-ins for the Steinberg WaveLab, Sonic Foundry Sound Forge and Creamware TripleDAT PC editing and recording applications. This impressive new technology is capable of restoring and enhancing damaged or badly recorded audio material which would previously have been considered beyond salvage, and it can be used to perform a wide

range of functions, including the removal of hiss from cassette and open-reel tape recordings; the elimination of spikes, glitches and drop-out from DAT and other digital sources; the eradication of background noise such as mains hum and system noise from mixers and outboard; and reducing the surface noise and crackle from ancient distressed vinyl LPs.

A word of caution is in order, however: although this new technology is surprisingly effective, inevitably some audio material will prove to be irrecoverable: audio restoration is a mixture of art and science, and it is better to aim for acceptable results rather than to expect perfection. Generally, most listeners tend to ignore low-level hiss or the occasional small pop but take exception to unnatural sounds, such as the flange-like artifact noise that can be introduced during digital processing. However, in situations where intelligibility rather than audio fidelity is the main criterion — such as when cleaning up telephone conversations and conference recordings — the presence of artifact noise could be unimportant.

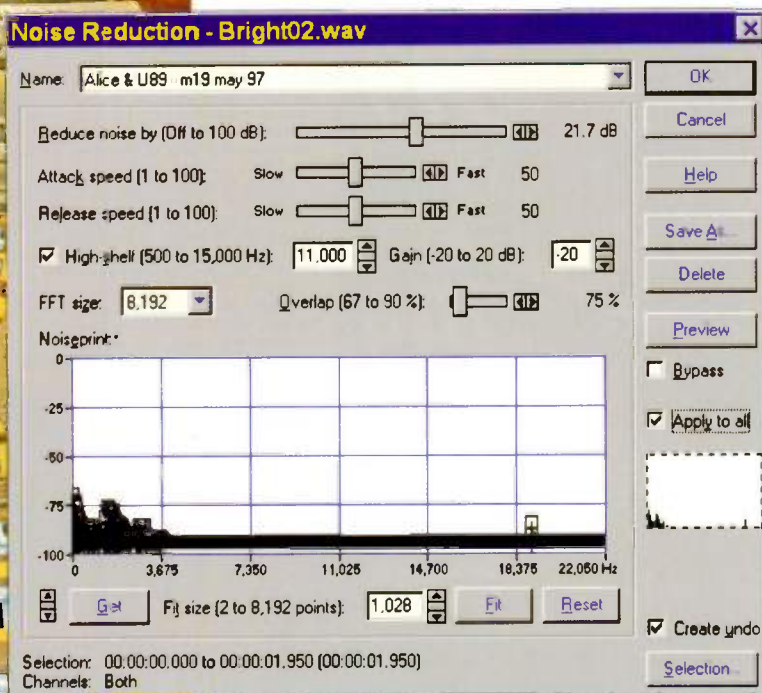
OLD MASTERS

Just as the removal of layers of old discoloured varnish from an oil painting often reveals unsuspected detail of line and colour, so too the stripping away of noise from an audio recording unmasks timbral and spatial qualities, and it is fascinating, when listening to successfully renovated audio, to realise that the recording sometimes sounds better than it did when it was originally made!

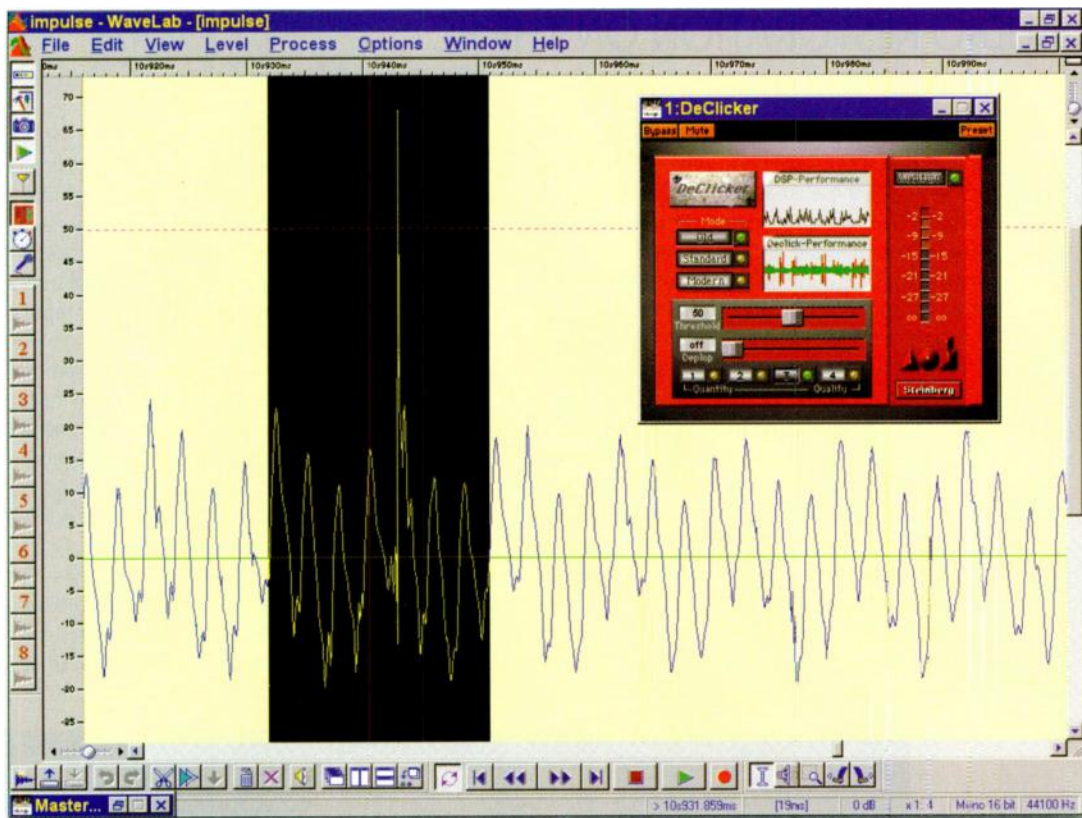
Unwanted noise comes in two main forms:

- Broadband Noise (also called Wideband Noise) is of a relatively constant nature and is present throughout the recording.
- Impulse Noise occurs unpredictably and is of a short, sudden character.

Broadband noise consists of unwanted background interference, such as that produced by tape hiss, mains hum, noise from PC hard drives and fans, machine noise from camera and tape machine motors and air conditioners, and system noise from mixers, outboard, synths and dirty guitar amplifiers. Most noise-reduction applications take a sample, or 'noise print', consisting of a region of 'silence' of between 0.5 and two seconds, that is representative of the background noise to be removed (the most convenient regions are usually those preceding the start or following the end of the main audio material). The noise reduction algorithm analyses the selected region of noise by its amplitude and frequency components, using a mathematical Fast Fourier



Sound Forge's noise reduction is highly effective at removing constant broadband noise, such as tape hiss, fan noise and mains hum.



Impulse noise appears as a spike on the waveform. Also shown is the Steinberg DeClicker plug-in.

Transform (FFT — see below) and extracts the unwanted noise using multi-band filtering. This is computationally very demanding and can be very slow on even fast PCs, but it is usually highly effective, so your patience is rewarded!

TAKING THE HISS

In the *Sound Forge* Noise Reduction module, the sample size and number of frequencies analysed is determined by the Fast Fourier Transform value: higher values provide greater resolution and finer detail, but take longer to process. A good starting value is -20dB, but it's worth experimenting on a small portion of audio to see which value gives the best results: lower values will remove less noise; higher values carry the risk of generating audible artifacts and possibly removing part of the source material. Often a multi-pass approach works better than single-stage processing, so rather than applying 30dB of noise reduction, three separate applications of -10dB may produce cleaner results.

The noise print analysis is displayed as an amplitude/frequency graph containing envelope points or nodes. These are adjustable individually or as a group, and their function is to raise or lower the amount of noise removed at the node frequency; the overall level of noise reduction applied is reflected by the distance of the envelope above the noise graph, with signal below the envelope being treated as noise; by default the envelope points are generated 6dB above the noise print. If, like me, you use noise reduction regularly on your recordings, it's worth leaving a region on the session tracks from which to take the noise sample. If you cannot find a suitable section of the audio file from which to take a noise print, most applications include presets for common noise-reduction tasks, and the *DART*

[Tracer Technologies noise-removal software, reviewed January 1997] DeHiss module operates using a standard noise print.

The main limitation of off-line noise print-based systems is that they operate on the assumption that characteristics of the noise print are common to the entire soundfile. If this is not the case, these systems may fail to provide a uniform renovation quality. To overcome this problem, the real-time applications — Steinberg's *Denoiser* and Creamware's *Osiris* — use a different approach, with a read-ahead adaptive algorithm filter that recalculates the noise content of the soundfile in real time.

When using noise reduction, special care should be taken to avoid inadvertently removing subtle low-level audio signal components and so throwing the baby out with the bath water! Reverb tails are especially vulnerable, and can be removed along with noise if long algorithm envelope release times are used; conversely, very high attack values may add unwanted artifacts, making your vocalist sound like an entry into the Eurovision Galgling Contest.

CREATURES OF IMPULSE

Impulse noise may be defined as any suddenly occurring disturbance that affects a recording, and includes pops and clicks from microphones; short scratches on vinyl disks; poor tape splicing, spikes and crackles caused by noisy potentiometers and switches on studio equipment; and glitches and dropouts on digital recordings, caused by faulty DAT recorders or corrupted computer soundfiles. Many low-amplitude clicks and pops may be removed with noise-reduction utilities, but to minimise the audibility of impulse noises we must look to dedicated click-removal processing. Clicks appear as sharp, jagged or high-sloped

PC REQUIREMENTS

You need a biggish PC and/or a lot of patience to run these applications! The reference system provided glitch-free real-time processing in stereo at 44.1kHz in both *WaveLab* and *Osiris*, and consisted of an Intel Pentium 200 with 48Mb RAM running Windows 95, with a 2Mb PCI graphics card, 2.5Gb hard drive space, Plasmon CDR 4240, Turtle Beach Pinnacle and Creamware TripleDAT soundcards. PCs with lower-powered processors than a Pentium 166 will struggle to run the more demanding applications in real time, and if you have this kind of machine, you'll have to be content with slower off-line processing. PCs equipped with SX or Cyrix 586 processors will experience difficulties in running most noise-reduction software, because of the weak floating-point processing capabilities of these CPUs.

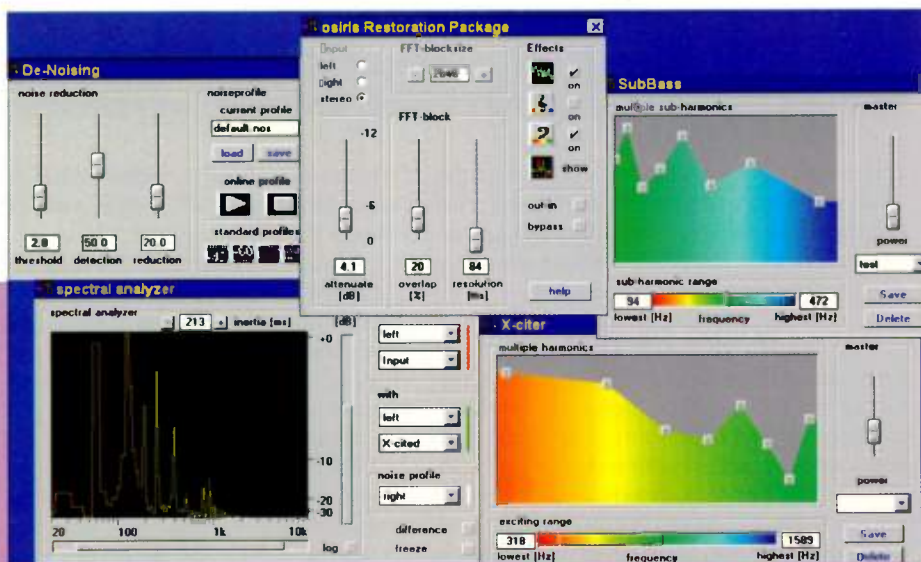
AUDIO RESTORATION ON THE PC

► spikes on the waveform, and these are identified by the de-clicker algorithm, which then applies processing to these areas, leaving the surrounding audio in its original condition. The click-removal algorithm mutes the section of damaged audio, and interpolates audio material from either side to fill in the space left by the offending click.

In practice, click removal is often very tricky and the results are variable — sometimes it may even prove more effective to remove the worst clicks manually! When attempting to repair dropouts, de-clickers can only correct dropouts of less than 60 samples — slightly more than 1ms at 44.1kHz sample rate — and, in practice, copying across a similar section of audio from elsewhere in the recording may yield a more satisfactory result. Occasionally, better results can be obtained by reverse time-processing the damaged audio prior to de-clicking, and this technique can be especially useful for the removal of impulse sounds with a slow attack and

sharp decay. To try this, first reverse the whole soundfile; next, apply de-click processing, and then reverse-process again to restore the original form. Bear in mind, though, that reverse time-processing may produce weird and undesirable results when combined with filtering, as with so much of audio renovation, it's a question of experimentation. De-click utilities should be used before applying other filtering techniques, such as broadband noise removal and low-pass filtering, as these processes can inhibit click detection; the exception to this rule is when the audio has large amounts of very low-frequency (under 30Hz) content. This sub-bass should be removed prior to de-clicking, to avoid introducing unpleasant low-frequency artifacts.

Click removal can also be used creatively — for example, to reduce harshness in digital recordings, or to soften the attack of brass and percussive instruments — but over-zealous application of de-clicking techniques will impart a dull, lifeless quality ►



AUDIO RESTORATION SOFTWARE

• SOUND FORGE PLUG-INS

The two *Sound Forge* plug-ins featured in this article are system-specific — they can only be used with *Sound Forge* and are off-line (not real-time) applications, although they do feature a preview function. The Noise Reduction plug-in is superb value and includes de-noise, de-click and vinyl restoration modules; the Spectrum Analysis plug-in provides a well-featured 2D monochrome spectrum graph and a sonogram.

£ *Sound Forge* £329; Noise Reduction Plug-in

£149; Spectrum Analysis Plug-in £89.

T MCMXCIX 0171 723 7221.

W <http://www.sfoundry.com>

• STEINBERG DENOISER AND DECLICKER PLUG-INS

These processors offer classy performance and the joys of real-time processing. They are available for *WaveLab* on the PC, and as TDM versions for Macintosh applications. *WaveLab* itself includes a very snazzy, rainbow-hued 3D frequency analysis module.

£ Plug-ins £299 each; *WaveLab* £399.

A Harman Audio, Unit 2, Borehamwood Industrial Park, Rowley Lane, Borehamwood, Herts WD6 5PZ.

T 0181 207 5050.

F 0181 207 4572.

• OSIRIS AUDIO RESTORATION SUITE

This powerful, impressive application bundle for Creamware TripleDAT and Creamware Masterport provides system-specific, top-quality real-time processing modules for spectrum analysis, de-noise, de-click, the only available budget de-crackler, plus an exciter and low-frequency enhancer. Why *Osiris*?

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£ *Osiris* £379; TripleDAT system £1290; Masterport £599.

T System Solutions 0181 693 3355.

• DART

Tracer Technologies' *DART* is the only stand-alone noise-reduction application, and produces good results, but lacks real-time preview and can be rather cumbersome in use. A more user-friendly Direct-X/ActiveMovie version is planned for release this year, with an expected price of an affordable £49.

£ £299.

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

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• WAVES NATIVE POWER PACK

The Rolls Royce of PC effects processors/mastering tools. As a Direct X/ActiveMovie plug-in, *NPP* runs in *Sound Forge* 4.0a, *WaveLab* 1.6, *Cakewalk Pro Audio* 6 and the forthcoming *Cubase VST*. In addition to the *Q10* equaliser, the pack also features the *TrueVerb* reverb, the *L1* Ultramaximizer limiter, the *C1* compressor/gate, the *S1* stereo imager and the *WaveConvert* soundfile utility.

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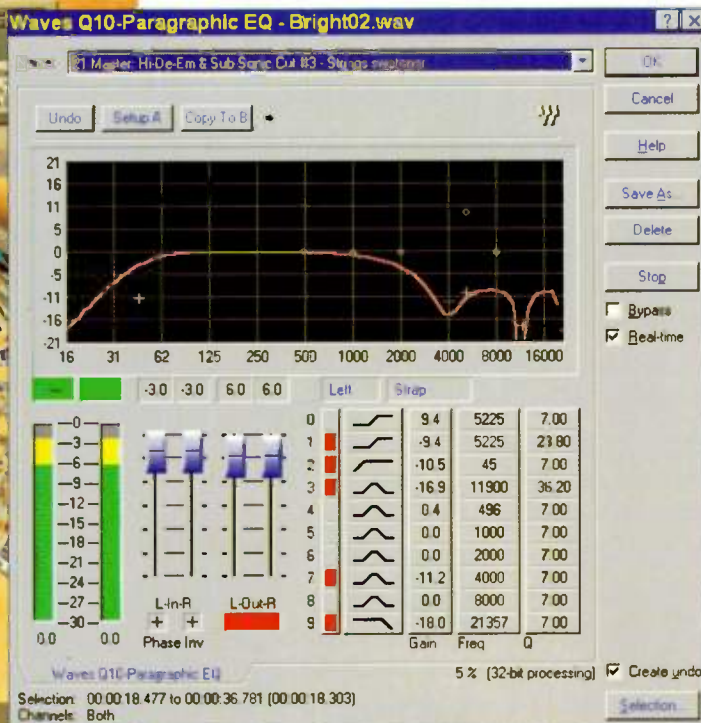
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AUDIO RESTORATION ON THE PC



Conventional digital editing tools play their part — this is the Waves Native Power pack Q10 equaliser.

- ▶ to recordings, as it will remove the attack transients upon which human hearing relies when identifying individual sounds. This said, de-clickers can be an invaluable studio resource when used with caution.

VINYL SOLUTION

Should original analogue master tapes be lost or damaged, there may be no alternative but to transcribe the vintage audio from vinyl disk. Noise reduction and de-clicking will play an essential part in the restoration process, but they can only achieve limited results, due to the particular nature of vinyl surface crackle. De-crackling technology is highly complex, and of the applications featured in this article, only Creamware TripleDAT's *Osiris* includes a De-crackler module — though the Steinberg De-clicker plug-in does a very creditable job and features settings for processing vinyl and shellac disks.

I SEE DC

There's a further source of impulse noise that needs to be tackled differently: DC (Direct Current) Offset

problems are caused by mismatches between digital recording equipment — usually soundcards and DAT machines — and give rise to audible clicks at splice and boundary points in soundfiles. Most audio editors include DC Offset detection and correction facilities, and it is easy to check if a soundfile has DC Offset problems by zooming in on a silent section of the waveform: when DC Offset is present, the waveform will appear displaced (offset) from the 0dB axis. If DC Offset is detected, it will be necessary to apply DC Offset correction whenever a recording is made, since it's an inherent and constant characteristic of the hardware used to make the recording.

NOMINALLY NORMAL

If a recording was made at a low volume level, normalisation can be used to optimise the signal without inducing clipping, whilst maintaining relative volume levels in the soundfile. The Normalisation process first involves scanning the soundfile to determine the peak volume level. The difference between the peak level and the onset of digital clipping (>0dB) defines the maximum amount of gain that can be applied during normalisation, although it is a matter of some controversy as to whether the true optimum signal level for digital audio files is 0dB or -0.1dB.

It's often necessary to correct any discrepancies in volume that might exist between different regions, to ensure a consistency of level throughout the recording. Gain changes should be matched carefully, so that level correction is a single-pass process, and this will reduce the chances of introducing distortion and artifacts by over-processing. Similarly, adjustments to the stereo balance may be required. It is not uncommon for the voices of inexperienced vocalists or voice-over readers to fade out at the end of a phrase; this is caused by poor breath control and/or movement away from the microphone. The answer here is to apply compression to the whole file to even out the overall level, and, if necessary, manually add volume changes on the quiet syllables to compensate for the lack of level. If needed, also apply de-essing to correct sibilance, and gate out breath pops and any other extraneous noise. Compression lowers the dynamic range of audio material by reducing the level of the loudest components and then raising the overall gain, and if a recording seems thin, adding compression will make the sound smoother and more solid

ALL THINGS BEING EQUALISED

Once gain processing is complete, any timbral adjustment can be made using EQ and enhancement. However, if you do not have access to the specialist noise reduction applications discussed earlier, the filters in your audio editor are invaluable: low-pass filters can be employed to remove high-frequency disturbance such as hiss, high-pass filters can remove boom and rumble, and notch filters can be tuned to attenuate problem frequencies that occupy narrow bandwidths. However, in order to maintain consistent levels, it's

ARCHIVING

It's best practice to back up all your material after each stage of restoration, so that you'll be covered should the need arise later to revert to a previous version. The amount of drive space needed for a full CD project can be considerable — especially if it involves restoration processing and,

unless you have oodles of hard drive space, it may be worth considering archiving backups to external data storage media. Backup to DAT can be slow but is otherwise adequate, although if the soundfile is saved as an audio track it will be necessary to re-record it to the PC as a WAV file. It's here that the speed and convenience of removable media comes into its

own: Iomega Jaz drives are a type of hard drive with a fast data transfer rate and use rewritable, removable disk cartridges that can store up to a gigabyte of data; recordable CD (CD-R) is also very useful, with a maximum 680Mb capacity, but recording large amounts of data can be a little slow and CD-R is a write-once/read-many (WORM) medium.

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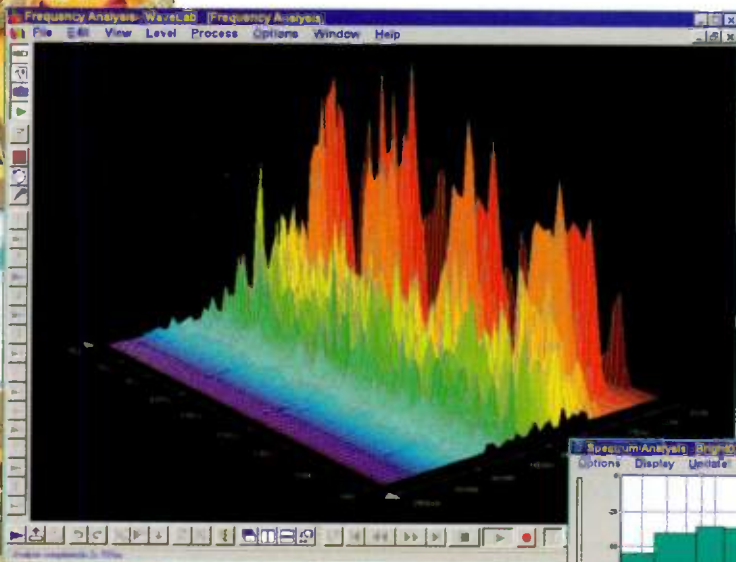
AUDIO RESTORATION ON THE PC

- ▶ better to apply EQ for noise reduction before carrying out gain correction. Some types of noise can be particularly tricky to remove because of their often wide frequency range and changing dynamics, especially noise from traffic and noise introduced via the off-line recording chain (from the mixer, outboard, synths and connecting cables). Noise from the recording chain is typically present throughout the whole recording, but is masked by the louder passages, and is most audible during quiet sections and at the start and end of the recording. The constituents of this type of noise are not constant, and vary as the different sources of the noise change level during the mix; consequently, processing with noise print-based techniques will be only partially successful, and the best approach is to treat problem areas individually with gating, expansion and EQ.

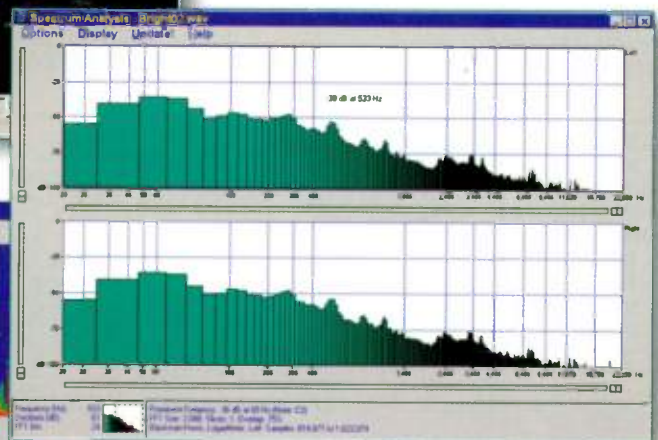
ASK YOUR ANALYST

Sometimes, rogue frequencies may be difficult to identify precisely. The spectrum analysis utilities provided by many audio editing applications facilitate this task by providing a graphical analysis of audio in the frequency domain (across its frequency spectrum). The time-to-frequency-domain analysis of audio signals used by audio spectrum analysis (and noise reduction) utilities is known as Fast Fourier transform (FFT). This derives from work in the early 1800s by the French mathematician Joseph de Fourier, which stated that any periodic signal can be recreated by adding together a series of harmonic sine waves. The three most common forms of spectral analysis display are two- and three-dimensional graphs and the sonogram — which both present an off-line static snapshot of the audio — and the real-time bargraph. The Steinberg *WaveLab* Frequency Analysis takes the form of a 3D graph and displays time and frequency across the two base axes, with amplitude represented on the vertical. This results in a snazzy 'mountains and valleys' view of the audio.

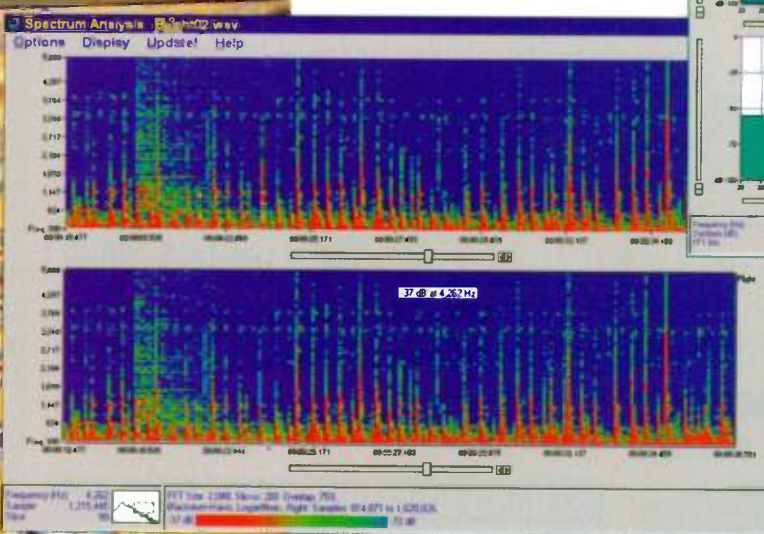
The *Sound Forge* Spectrum Analysis plug-in suite includes a sonogram display and is a 2D frequency/time graph in which amplitude is represented by colour intensity. Sonogram images present distinctive spectral patterns of sound and, given skilled interpretation, individual sound sources can be distinguished — for example, off-camera audio of a street riot can be analysed



WaveLab 3D graph.



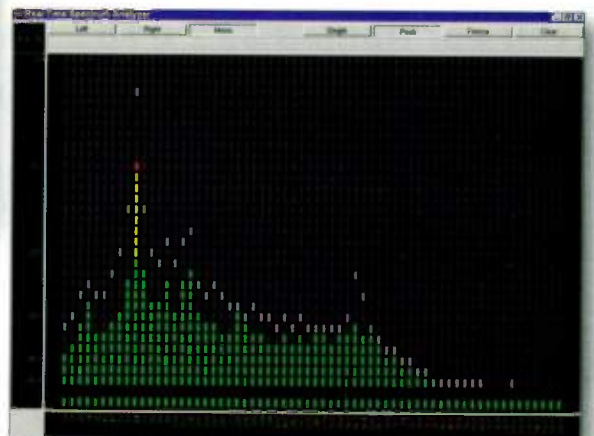
Sound Forge 2D graph.



Sound Forge sonogram.

Spectrum Analysis displays are useful for tracking down rogue frequencies.

TripleDAT real-time bar graph.



visually to separate speech from traffic noise or gunshots. TripleDAT features a good example of the real-time bargraph display amongst its measurement instrument set. The audio signal is displayed as easy-to-read multiple frequency bands arranged across the horizontal axis, with the amplitude represented by the height of the columns, which dance in real time as the signal passes through the processor.

VIRTUAL SPICE

It's often easier to replace a section of damaged audio by substituting a section from elsewhere in the recording. Whilst it is possible to do this in a stereo audio editor, it's much quicker to use an editor with multitrack facilities and employ the processing muscle of the computer to make virtual splices, by switching in real time between audio regions on adjacent tracks. Imagine a song with a damaged chorus, which we'll replace with another undamaged chorus from elsewhere in the recording.

- First, load the soundfile containing the damaged chorus to track 1.
- Add cue points or markers to define the boundaries of the damaged section that is to be replaced — these will act as virtual splice points. The two markers should be positioned at musically significant points — the first downbeat of a bar usually works well — and to avoid creating a glitch, the markers should be placed at zero-crossing points relative to the waveform dynamic.
- Create a new region containing the replacement audio and add this to the adjacent track 2.
- Zoom in and align the two regions using the cue points.
- Add a -70dB cut to the start of track 2 to mute the unwanted audio, and at the first marker point bring up the level of track 2 to 0dB and attenuate that of track 1 to -70dB.
- At the second marker, reverse the procedure, restoring the volume level of track 1 to 0dB and cutting that of track 2 to -70dB. This should give a clean splice, though you may need to adjust the relative levels to suit the piece. If the results are unsatisfactory, try applying crossfades at the splice points.

REAL-WORLD RESTORATION

To conclude, here's a description of an audio restoration session I conducted earlier this year, after being contacted by the well-known Indian classical dance specialists Sheila Cove & Nick Proctor. The project was to renovate and transfer to CD rare recordings of Sheila's teacher, the respected Bharat-Natyam guru Bala Sundari. The recordings were consumer DAT transcriptions of second-generation reel-to-reel copies dating back to the early 1970s, recorded live in India on what I guess was, by modern standards, a fairly primitive mono tape recorder. The pieces featured solo and ensemble vocals with flute, violin, tanpura and various percussion including mridangam (a double-headed barrel drum).

The first procedure in the renovation process was to transfer the recordings digitally from DAT



It is easy to replace regions of damaged audio material with material from elsewhere in the recording, using a multitrack editor like SAW Plus, by performing virtual splices — level-switching in real time between audio regions on adjacent tracks.

to their own folder on the PC hard drive. As the original recordings were made in mono and then copied to the stereo DAT format, I converted the files to mono, which halved the amount of hard disk space needed and also halved the time taken by subsequent processing tasks. Next I removed the DC Offset, and then, as the final destination of the recordings was Red Book audio CD, the 48kHz tracks were converted to 44.1 kHz.

The biggest problems were with the tape noise and rumble, but fortunately there were sufficient 'silent' regions from which to take noise samples, and two passes with *Sound Forge* Noise Reduction produced spectacular improvements that brought the recordings back to life, showing not only a significantly greater clarity and tonal richness in the solo vocal and the accompaniment, but also revealing for the first time details of the original room acoustics, the presence of background voices, and the faint spill of traffic from the busy street outside the dance studio in which the recording had taken place. The noise reduction processing was applied to the recordings individually, after which the tracks were topped and tailed to remove unwanted space from the start and end of each. After backing up the files I then listened critically to each recording, noting the regions that required further attention (for the most part these represented discrepancies in volume level), and defined these by adding markers to the waveform display. Then the *Q10* equaliser from the *Waves Native Power Pack* was called in to filter out the worst of the traffic rumble, minimise the recording's slightly boomy room acoustic and, finally, enhance the presence by lifting the lower mid-range frequencies. To complete the session, the tracks were batch-processed into stereo and passed through the *Waves L1 Ultramaximizer* to ensure optimum levels, and then written to Red Book audio CD using *WaveLab 1.6*.

SOS

AUDIO RENOVATING CHAIN

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2. Sample Rate Conversion.
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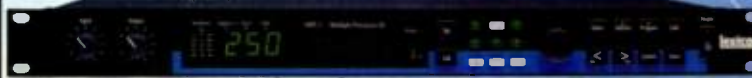
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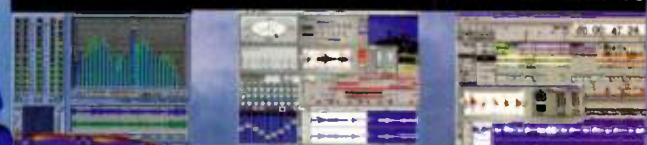
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BOTTLENECK

IDENTIFYING THE WEAKEST LINK IN A PC HARD DISK RECORDING SYSTEM

Hard disk recording is a lot to ask of your PC, and however powerful

it is, its overall performance may be limited by just one of its components.

MARTIN WALKER pinpoints problems so you can plan your next upgrade.

BLUES

All computers are put together using a set of components, but in the case of PCs the components can come from a wide range of manufacturers, with an equally wide range of performances. As the old saying goes, 'A chain is only as strong as its weakest link', and there will always be one component that holds back overall performance in a particular machine. Most complete systems are put together in a fairly balanced way, so for general-purpose applications there ought to be no obvious contenders for immediate upgrading. However, the thorny subject of hard disk recording generates more telephone calls, letters, and emails to sequencer helplines (and the SOS offices!) than any other subject. The difficulty is that hard disk recording is very unlike most mainstream applications in the way that it stresses the PC. Equipment that works perfectly well in most other

applications, including normal MIDI sequencing, may well stumble when called on to provide real-time audio processing as well as simultaneously recording and playing back tens of megabytes of data from the hard disk drive.

It's a problem that's cropped up frequently in SOS over the last six months, in the ongoing discussion of the relative merits of various processing chips, and the performance of certain makes of hard disk. To shed more light on the subject, and to help those who need an upgrade, but are not sure of what, here are full details of which components affect hard disk recording. Also included is a head-to-head benchtest of PC processors running actual music applications, showing just what happens in real life. This will help you to find out whether you are suffering from the Bottleneck Blues.

SLIPPED DISKS

More than any other component in the PC, the drive gets 'thrashed' when you're hard disk recording. Called upon to play back eight or more tracks of existing audio, which may well be scattered all over the surface of the disk, it must also simultaneously be able to write the audio data that you are recording. Mainstream applications normally require short bursts of data to be loaded or saved, with a lot of dawdling in between, while the user types in further information or admires the screen display, so hard drives are still widely specified using 'burst' ratings. But a quick sprinter is not as useful for hard disk recording. What you need is a marathon runner — not as fast over a 100-yard stretch, but much more likely to get to the end of a 26-mile course without having to stop for some muscle manipulation.

The most useful specification for our purposes is 'Average Access Time', since this specifies the total time taken to find the data required. Many manufacturers specify 'Seek Time' (a good figure to aim for is 10ms or better), but this figure only gives the time taken to move the read/write head to the correct position, and is not the whole story. To convert from Seek to Access Time, you need to add the time taken for the disk drive to rotate enough for the correct data to arrive beneath the head. This is known as Latency, and is determined by the spindle rotation speed, since the faster a drive rotates, the sooner any bit of data will arrive — on average — under the read heads of the hard drive. Latency is calculated from the rotation speed, as the time for half a rotation. Most well-



Figure 1: Wavelab has a monitor that shows processor overhead, and this is very useful in finding out how your PC is coping with real-time effects.

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IDENTIFYING THE WEAK LINKS IN A PC RECORDING SYSTEM

► specified drives currently have a speed of 5400rpm (giving a latency of 5.56ms), and will be good enough for hard disk recording. The Quantum Fireball drives, which were the darlings of the PC magazines in 1996, used to achieve excellent overall test figures. These have, however, been replaced with the newer Fireball TM range of drives

world of the recording studio.

Most people already have PCI disk controller cards, but if you have an old ISA card, then this will hold back the top performance of your drive: the PCI buss operates at 33MHz as opposed to the ISA's 8MHz, and is therefore more efficient at moving data about, but also, once started, it can continue transferring information while the processor carries on doing other things.

In the continuing debate over the merits of EIDE and SCSI drives, hard disk recording is again a factor. Although the latest EIDE drives have speeds on a par with SCSI devices, they are still likely to occupy your main PC processor more than any SCSI device will — provided it's using a Buss Mastering DMA SCSI card, which has its own onboard processor to carry out the bulk of hard disk data transfer. If you want real-time EQ and effects, using a SCSI drive could be a great way to release more of your main processing power for this purpose. As always, this rams the point home that it's pointless to look at component performance figures in isolation.

It's the same situation with 24-speed CD-ROM drives. Although test figures show that data can be read at up to 24 times audio CD speed, moving this amount of data from the CD-ROM to other areas, such as your sound or graphics card, will occupy your PC's main processor for a large proportion of the time — expressed as a percentage, this is known as processor overhead. Manufacturers quote the top speeds available when the processor is occupied all the time: 100% processor overhead. But many PC magazines also test these drives in more real-world situations, for example with an overhead of 60% (which would leave 40% of the time for the processor to actually run a real application), in which case the drive transfer rates will be significantly slower: test figures for a single component never tell the whole story.

The final factor for hard drives is thermal recalibration. All drives expand and contract as the temperature varies, so they have to periodically nip off to check that the data is still being dealt with reliably: most spend a couple of seconds every 20 minutes or so carrying out this thermal calibration. It's not usually noticeable — but, during a marathon, the last thing you want is the PC telling you that one of your limbs is going to be tied

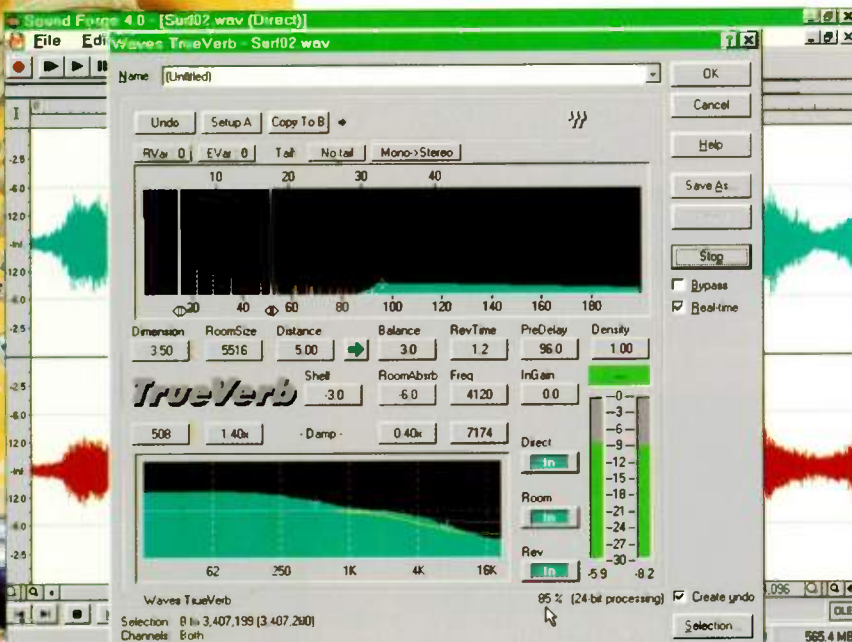


Figure 2: In Sound Forge, plug-ins such as the Waves TrueVerb show how much processor overhead they are using.

which, although they have lower prices, compromise on performance by dropping rotation speed to 4500rpm (giving a latency of 6.67ms), and so are not so suitable for hard disk recording.

There are drives available that run at 7200rpm or even more. These should give excellent performance, but may suffer from two unfortunate side-effects. Some have a tendency to emit a high-pitched whine (because of the higher rotation speed), which can be annoying in the recording studio. Also, the heat generated by a drive is connected to its speed of rotation, so some drives with a very high rotation speed (such as the 10,000rpm Cheetah SCSI) may even need an additional cooling fan to ensure reliability, which is hardly welcome in the peaceful

SWAPPING PROCESSORS

If you decide to upgrade your PC by installing a faster processor, several things need to be borne in mind. First and foremost, you need to find out whether your current motherboard actually supports the device you are proposing to use. If your machine arrived with a motherboard manual, showing jumper settings, BIOS details and so on, then it will undoubtedly have a table showing how to change the jumper settings to adjust it for use with a range of processors. If you didn't get a

manual then you will probably be able to download one from the Internet, but finding out the manufacturer and model isn't always easy — many motherboards are totally anonymous, and have no obvious markings. Mine came with a manual, but even this declined to name the manufacturer. If all else fails, open up your PC and look on the board itself for any markings. Mine said ms-5128, so I entered this into a Web search engine, and after trawling through a few entries discovered that it was made by

MicroStar. Looking on their site confirmed this, and I was able to also confirm that this model was already compatible with MMX processors up to 200MHz.

Two motherboard adjustments need to be made — processor clock speed, and CPU voltage. Most modern high-speed processors of 166MHz and above will use an external clock of 66MHz (this is the speed at which the motherboard runs — the processor itself will operate at a fixed multiple of itself). Although early Pentiums operated at 5V, all speeds from 75MHz onwards

used 3.3V (or thereabouts) for CPU voltage. The potential problem with the latest MMX devices is that they require 2.8V, and not all motherboards can provide this. If you try to run the chip at a higher voltage, it will probably work, but will run significantly hotter, and this will shorten its life. At the sort of prices we are talking about, it's not worth taking the risk. The MMX Overdrive upgrades (see June's PC Notes) are more expensive, but incorporate an extra voltage regulator that allows you to install an MMX device on motherboards that only cater for 3.3V.

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WRB

IDENTIFYING THE WEAK LINKS IN A PC RECORDING SYSTEM

► up for a few seconds doing something else. Most people carry on regardless and, on the rare occasion that their sequencer throws a wobbly, will probably not even realise what has caused the hold-up. The chances of a peak amount of audio data being required at the same time as a thermal calibration is probably fairly low, and some drives do wait until they're idle before they do one.

However, if you want a bomb-proof machine (and in recording studios it is commercial suicide to leave this sort of thing to chance), you will require a drive that's optimised for audio-visual use. An AV drive might be rather more expensive than a non-AV device, but its thermal recalibration will be specially designed to use a minimal amount of time, and this will probably be spread out, rather than all at once, so that the drive never 'stutters'. AV drives also tend to be of the SCSI variety so, although the drives are more expensive than EIDE types, the difference between AV and non-AV is often only about £30. Micropolis is the name that crops up more often than not in this area.

CHIPS WITH EVERYTHING

For general-purpose recording of MIDI music, even the now-humble Pentium 100MHz processor will be more than sufficient, since MIDI does not take a large overhead. For example, I tried playing back MIDI files containing between eight and 16 fairly densely packed tracks, and with a Pentium 100MHz processor the total overhead was between 10 and

20%, using either *Cubase Score* or *Logic Audio* — no problems here! Once you introduce an audio component, though, the situation changes dramatically. If you're recording and playing back multiple audio channels, the speed of your hard disk drive becomes a far more important factor. If you look at the results of *Cubase Audio's* test in the 'Processors Compared' box, you can see that, whatever the processor, the bulk of the total time taken is spent reading from the hard drive.

Most manufacturers nowadays recommend a minimum of a Pentium 133 — or, more sensibly, a 166MHz — for any PC hard disk recording system. However, compatibility can be a problem. For mainstream applications, the three main processor manufacturers, Intel, Cyrix and AMD, each have a range of processors designed to have similar performances to their competitors at particular clock speeds. However, Cyrix, whose P166+ benchtests around 6% faster than the equivalent Pentium 166MHz in a range of mainstream applications (confirmed by my tests), has one area in which it finds it hard to compete — floating-point arithmetic. Every computer processor contains an internal maths

“Hard disk recording is very unlike most mainstream applications in the way that it stresses the PC.”

co-processor or FPU (Floating Point Unit) to work out the results of complex mathematical calculations. Music software may use this sort of calculation a lot to ensure superior audio performance, but in mainstream applications it's rarely important, and people happily use the Cyrix P166+ instead of a straight Pentium 166, to give a slight performance boost but at about half the chip price.

When a set of audio waveforms is mixed together to produce the final stereo pair that will emerge in real time from the output of a soundcard, it seems, from my tests, that little floating point is again used, and so a Cyrix chip can compete with even an MMX in some cases. However, as soon as any EQ or effects are needed, a lot of floating-point calculations will get carried out, and the performance penalty if you're using a Cyrix processor will be much more significant.

Your choice of processor may be dictated by other hardware requirements, as some manufacturers (notably Creative Labs with their AWE64 soundcard) have decided that, rather than put up with the slower floating-point performance of the Cyrix chip, they will automatically disable the WaveSynth and WaveGuide features if a Cyrix processor is detected. This does rather take the decision out of your hands,

PROCESSORS COMPARED

• PROCESSOR OVERHEADS

Processor	Cyrix P166+	Intel P100	Intel P166	Intel P166 MMX
Waves Native Power Pack v1.3b with 24-bit plug-ins (host application Sound Forge v4.0b)				
S1 Stereo Imager	28%	16%	9%	9%
C1 compressor	33%	20%	12%	12%
C1 gate	37%	22%	13%	13%
L1 Ultramaximizer	48%	48%	29%	29%
Q10 paragrahpic EQ	107%	49%	30%	29%
TrueVerb	150%	122%	69%	69%

Steinberg WaveLab v1.6

Normal overhead (no FX)	10%	7%	5%	5%
Additional overheads:				
Echo	7%	4%	3%	3%
Reverb	15%	9%	6%	6%
3-Band EQ	26%	11%	7%	7%
Chorus	24%	16%	11%	10%

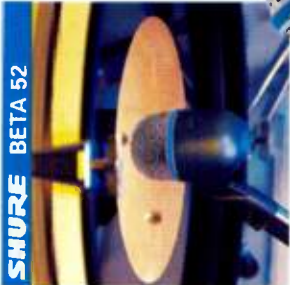
MIDI+Audio sequencers running eight tracks of 44.1kHz audio and eight MIDI tracks

Cubase Score 3.05	35%	50%	43%	35%
Logic Audio 2.6	36%	45%	42%	37%

• PROCESSOR TIMES

Processor	Cyrix P166+	Intel P100	Intel P166	Intel P166 MMX
Steinberg Cubase Score v3.05 playing an audio file				
Hard disk time per second of audio	103ms	98ms	104ms	106ms
Mixer time per second of audio:				
Mono	5ms	27ms	16ms	16ms
Stereo	5ms	27ms	16ms	16ms
Time per track:				
Mono	56ms	76ms	68ms	66ms
Stereo	114ms	125ms	118ms	120ms

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IDENTIFYING THE WEAK LINKS IN A PC RECORDING SYSTEM

▶ but Creative Labs' stance does make it easier to make a processor choice if you must have an AWE64 card.

However, with the advent of *Cakewalk Pro Audio 6.0*, and the soon-to-be-released PC version of *Cubase VST*, sequencers are increasingly being called upon to achieve real-time processing of EQ and effects, in addition to MIDI and audio recording and playback. This uses more and more floating-point maths, putting more and more strain on the processor. The result is that an ideal system for this sort of application will need a more powerful processor to avoid a bottleneck — and the standard benchtest results published in mainstream PC magazines can be

the Cyrix P166+, will be quite happy to deal with eight simultaneous stereo audio tracks. Interestingly, in general MIDI+Audio recording applications, the Cyrix P166+ outperforms the standard Pentium P166, even matching the latest P166MMX. This in itself is not a reason to buy the Cyrix chip, but it shows how efficient the Cyrix is for mainstream applications that need little floating-point calculation. The *Cubase* test shows that, whichever processor is used, it's the speed of the hard disk that largely determines how many simultaneous tracks will be achieved. My Quantum TM drive is slow, and I would see significant improvements in overall

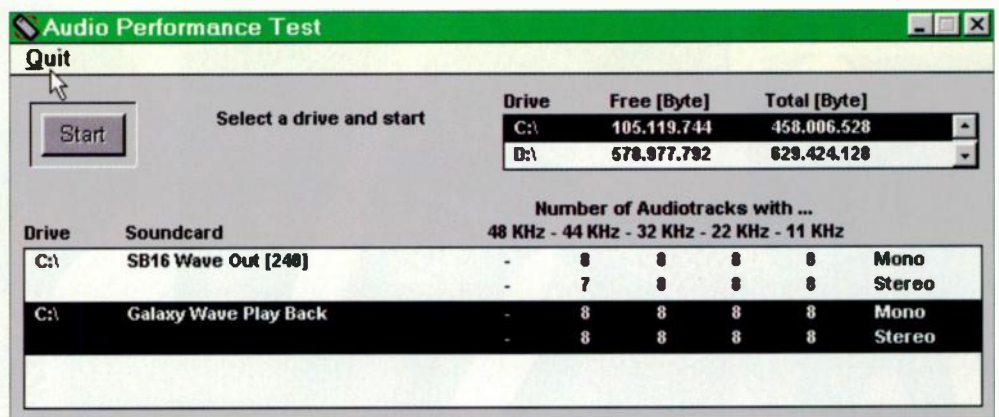


Figure 3: The *Cubase* Audio Performance Test saves a text file called *Perfmchk.log* into your *Cubase* folder when you click on *Quit*. This contains the actual timings for your system.

misleading to musicians who use their PCs for hard disk recording with real-time effects.

As far as I have been able to ascertain, there have never been any tests published to show how significant any performance penalty might be when actually running the latest music applications. So I persuaded my local dealer (Solutions of Cheltenham) to lend me a real Pentium 166MHz processor, and a Pentium 166MMX, to compare with my Cyrix P166+. The results of my investigation can be seen in the 'Processors Compared' box. However, do remember that, although you can isolate the variation due to this one component by simply swapping the processor and leaving the rest of the system alone, this variation is still no more than a guide to how much the same change will affect a different system.

TESTING ONE TWO THREE

All these processors have a typical overhead when playing back most MIDI files of only 10 to 20%. Of course, if your machine is already struggling to manage eight tracks of audio, this additional MIDI overhead may tip the balance, and cause glitches. If you look at the data in the 'Processors Compared' box, *Cubase Score 3.05* running on my machine with an Intel Pentium 100MHz takes 125ms per stereo track, so running eight tracks would take $8 \times 125 = 1000$ ms, or exactly 1 second, to process each second of data. Attempting to run a sequencer as well is impossible, and in fact the *Cubase* performance test did show a maximum of seven possible stereo tracks. Any faster processor, including

performance if I replaced it with a drive that had a rotation speed of 5400rpm or more.

Wavelab 1.6, with a Cyrix P166+ in the system, will manage three chorus plug-ins ($10+24+24+24=82\%$), but will glitch with four in circuit. You can work out for yourself what typical combinations of plug-ins this system will manage. In particular, note that the *WaveLab* reverb takes a comparatively low overhead, indicating that it's fairly basic compared with *TrueVerb* in the *Waves Native Power Pack*, but of course it does come bundled free with *WaveLab*, and works well in context on single tracks. With *Sound Forge*, normal operations such as compression and gating will work fine with a Cyrix P166+, but any heavy-duty Paragrophic EQ or *TrueVerb* falls over in real-time preview, although of course it can still be used in non real-time.

For many people, possibly the most surprising results will be those for the MMX processor — in most of the music applications I tried, there was absolutely no difference between a straight P166 and the MMX equivalent. Only when looking at a sequencer in action (see *Cubase Audio's* performance figures) did I find the overall 10% or so improvement claimed for mainstream applications. You would be mad to buy a new system without an MMX version installed, but if you intend to just upgrade your processor, don't bother to move sideways to MMX — go for a higher clock speed, as this will result in a much better performance. Overall, the results are perhaps not that surprising. With my machine running standard MIDI sequencers, or even

EQUIPMENT USED

The test results will only be valid on my own system, but to give you an idea of its performance relative to yours, here's a brief specification:

Microstar 5128 PCI Plug and Play Motherboard; 32Mb EDO RAM; 512kb pipeline burst cache; 1Gb Quantum Fireball TM drive (4500rpm; average seek time 12ms); Trident 1Mb PCI graphics card running at 800x600 with 256 colours; AWE32 PnP soundcard with DirectX drivers.

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IDENTIFYING THE WEAK LINKS IN A PC RECORDING SYSTEM

- ▶ up to eight channels of stereo audio, the difference between these processors is dwarfed by the basic performance of the hard drive, which is doing most of the work, and is the main bottleneck.

However, the situation changes dramatically as soon as real-time processing enters the scene — typically, for amplitude-based manipulation (such as compression, gating or the *L1 Ultramaximizer*), the true Pentium chip outperforms the equivalently clocked Cyrix chip by between two and three times. When a lot of floating-point maths is needed (for instance, by the Paragraphic EQ), this performance boost by using a true Pentium leaps to 360%, and for real-time EQ applications you could compare the performance of the Cyrix P166+ chip with a Pentium 66MHz!

I was hoping to include processor tests using the only currently available sequencer that allows real-

buy the cheapest PC available, you could find it up to 10% slower than the best. Finding out which components tend to achieve the highest scores in isolation is a start, but building a balanced system requires more than one pedigree component.

The Matrox Mystique and Millennium graphics cards, for instance, have become almost standard in well-performing PCs, but at very cost-effective prices. The last thing you want holding up overall performance is a screen update, and both hardware design and driver efficiency will affect this. In many cases, using a display with 256 colours rather than 64,000 will reduce your graphic overhead significantly, and using a utility such as *QuickRes* (see May's PC Notes) means that if you need alternative colour depths or screen resolutions for other non-sequencing applications, they are only a couple of mouse clicks away.

No-one should be using 8Mb of RAM nowadays, unless they like their PC to limp. 16Mb is adequate for many purposes, although 24Mb is better, and, with memory currently costing about £50 per 16Mb, a total of 32Mb is slowly but surely becoming the new standard. Performance increases are claimed to be between 5 and 15% when you move from 16 to 32Mb, but, again, this is in mainstream applications. EDO (Extended Data Output) RAM increases the performance of a PC by allowing the next read to start before the previous one has finished (writes happen at exactly the same speed as normal RAM); this overlap cuts the cycle time by about 20%. The motherboard must support it, but the chances are that, if it does, EDO RAM will already be fitted (check your BIOS readout). The pipeline cache is normally claimed to give typical performance increases of around 3% when expanded from 256Kb to the maximum 512Kb. Since this normally only costs about £15, there's no reason not to upgrade, as long as your motherboard has an expansion

socket to take the Cache On A Stick (COAST) module. It's best to buy this from the supplier of your motherboard or complete PC, since various flavours exist, depending on the motherboard model.

A QUESTION OF BALANCE

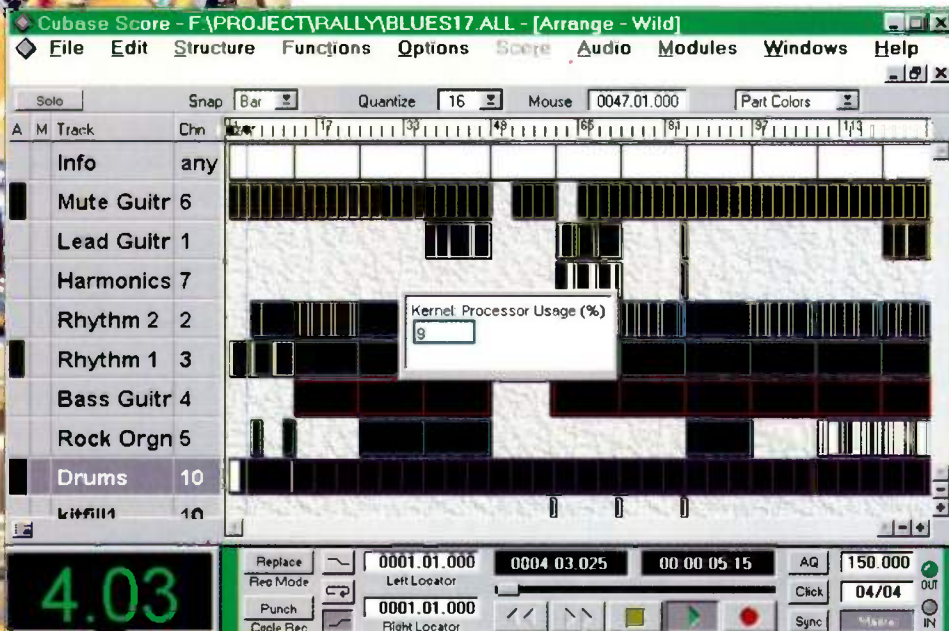
Whatever the spec of your PC, there will always be one component that's the weakest link in the chain. Judging by readers' letters, often the only difference between a budget PC hard disk system and a professional one is that the soundcard is borrowed! Regarding MMX, although the potential performance boost with some applications is claimed to be as high as 60%, in reality, six months after its launch, there are still few applications that take full advantage of the possibilities. Games and graphic packages stand to gain the most but, for music, none of the major manufacturers seems intent on using MMX. This is partly because 24- and 32-bit audio

Figure 4: When you're running only MIDI tracks, the typical processor overhead is quite small, as you can see in the central box here.

time EQ and effects (*Cakewalk Pro Audio 6.0*) but although this worked extremely well, it's a 'multi-threaded 32-bit' application: it typically occupies no more processor time than similar applications, but the processor overhead utilities permanently read 100%, making it impossible to get meaningful figures.

OTHER LINKS IN THE CHAIN

The main potential bottlenecks for PC hard disk recording do tend to be the processor speed and the hard disk drive, but the rest of the components will have some impact too. If individual differences are small — the overall performance spread for motherboard designs, for instance, is only a few per cent from slowest to fastest — they still have a cumulative effect, so the company that markets the fastest PC with a particular spec will be the one that chooses the fastest component in each category. This will obviously affect price; if you



FAULT LINES

Unfortunately, there's more to choosing a processor than comparing its speed with competing models. One of the most frustrating things about modern hardware and software is the rare crash due to conflicts and bugs. Only a real Pentium can be 100% Pentium compatible, and, despite the fact that '99% of all known software' will run with other brands of processor, it is normally up to the individual software developer to check that a particular

application works as intended with all processors, and this is not always done. It sometimes only takes one line of code to cause a crash!

I have successfully run *Cubase Score 3.05*, *Logic Audio 2.6*, and *Cakewalk Pro Audio 6.0* with my Cyrix P166+ processor (and in the case of *Cubase* have run it for about six months with no problems), but have had occasional crashes when using *Netscape Navigator 3* (16-bit version) to browse on the net. These crashes disappeared when I installed any of the

Pentium processors. One of my fellow musicians and friends also bought a Cyrix P166+ back in January, but he had so many complete system crashes while using *Procyon Pro* that he ended up saving after each take, just in case. He has just replaced it with a Pentium P166, which seems to have cured the problems. In both cases, the crashes seemed to be more likely to occur when running with 16-bit applications, rather than with Windows 95-specific code.

None of this is intended to denigrate

the Cyrix processor — it performs remarkably well for its price, and still beats the vanilla Pentium in mainstream applications, but neither Cyrix nor AMD processors can be guaranteed to work faultlessly unless the software is bug-tested with them. In general, this does mean that it's safer to stick to 'real' Pentiums for music applications, unless the manufacturer of your particular sequencer package states that it has also been recommended for use with AMD or Cyrix processors.

manipulation is needed for high-end music applications, with a lot of floating-point maths. The extra features provided by MMX are activated internally as an alternative to the normal floating-point unit, and so there will be some performance penalty if you're constantly switching back and forth between the FPU and MMX features. Ultimately, the main improvement if you are buying an MMX processor is the 10% or so basic speed improvement, caused mainly by its other features, such as a bigger internal memory cache. The tests here show that, in real terms, MIDI+Audio sequencers will show this sort of improvement, but floating-point work will show no noticeable changes.

No doubt the subject of compatibility will come back to haunt us when AMD's new K6 processor appears in large quantities. This has a typical

performance that beats the Pentium MMX processor at its own game and, since the MMX code is identical to kosher Intel devices (having been directly licensed from Intel themselves), there ought not to be any compatibility problems. We'll wait and see. Cyrix have a new range of M2 processors due to be launched shortly, but their version of MMX is re-engineered, to provide the same functionality but with different code. It sounds as if there could still be troubled waters ahead for Cyrix-owning musicians.

The moral is clear — if you intend to run hard-disk audio then you can get away with using the Cyrix P166+, and save yourself about £100. If you anticipate doing any EQ or real-time processing (*Sound Forge*, *Wavelab*, *Cakewalk Audio v6*, *Cubase VST*) then a real Pentium is a must. I'd better start saving up!

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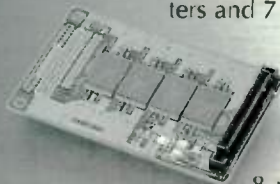
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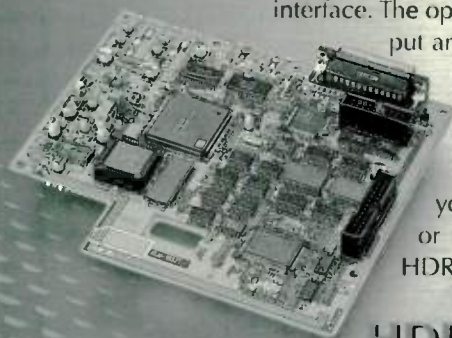
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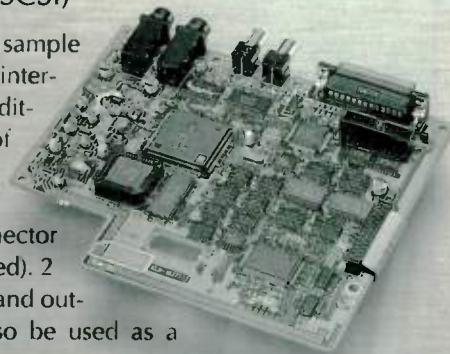
This board adds a SCSI port to the Trinity enabling you to connect the Trinity to an external hard drive or CD ROM drive. (This option is included in the HDR TRI Option.)



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FRANKING MACHINES

A TECHNOLOGICAL TRIBUTE TO FRANK ZAPPA

PAUL D LEHRMAN took six players, four samplers and a computer, and created a live-performance piece based on the music and words of Frank Zappa. It left the audience delighted — and utterly confused.

I've always been intrigued by the idea of live musicians performing with electronics. And I don't mean a singer standing at the front of a stage while a sequencer drones on in the

background — I'm talking about people interacting with machines the way human performers usually interact with each other, with all the flexibility, spontaneity, and uncertainty that implies.

I took my first forays into this realm over two decades ago when, as a college student, I composed an 'electric sonata' for electrified bassoon (that is, a bassoon with a pickup on its crook, fed through a fuzz box, a wah-wah pedal, and a Fender Twin Reverb) and pre-recorded tape. The tape I created in the college's all-analogue, all-discrete electronic music studio. Tape, of course, is a very restrictive medium, in that the only control you have over it is

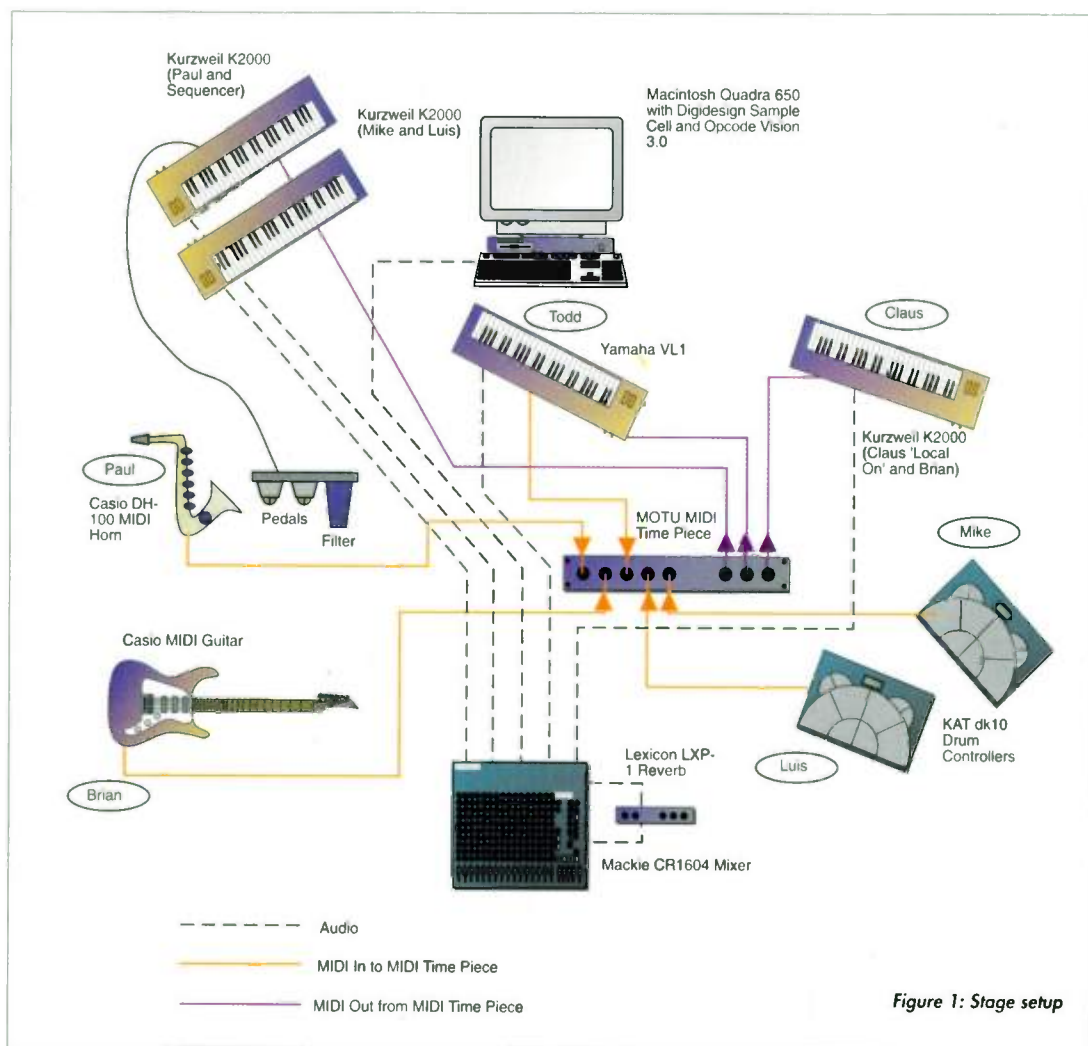


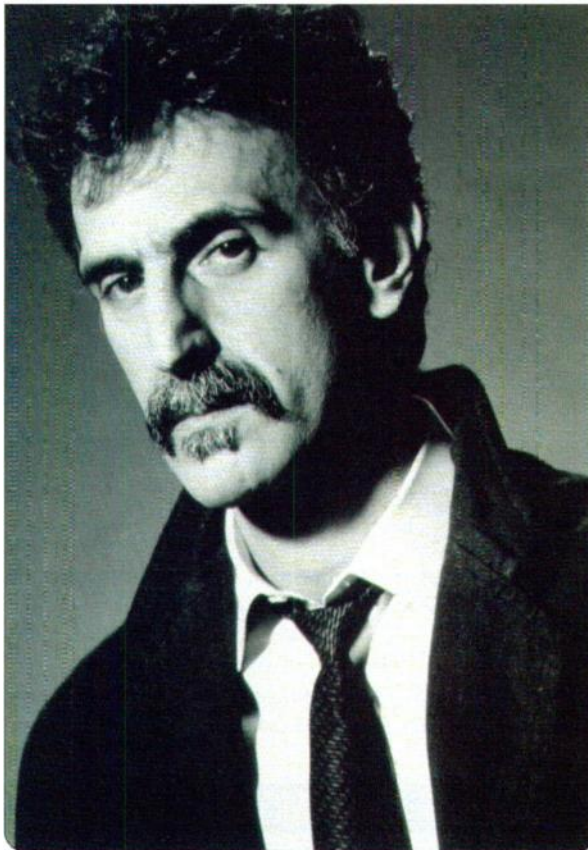
Figure 1: Stage setup

when it starts and when it stops. But working with electronic sounds made it possible to open the audience's ears by 'identity confusion': you could make it very difficult for listeners to tell whether it was the human being or the machine that was making the sounds they were hearing.

With the advent of MIDI and the Mac, all sorts of possibilities opened up, both in terms of the availability of new sound sources, and in the fact that real-time interaction with a computer sitting in front of you was now possible. In the 1980s I composed a series of solo performance pieces that used a combination of keyboard, breath and percussion controllers, and pitch-to-MIDI converters, in conjunction with computers running sequencing and algorithmic composing programs. The last — and in terms of performance, the simplest — of these was 'I Dig A Pygmy', a tribute to John Lennon on the 10th anniversary of his death, which used nothing but sampled sounds of Lennon and the Beatles, computer-modified and loaded into a Roland S770 sampler (later a Kurzweil K2000), and then played back 'live' from a keyboard (see *Sound On Sound* from December 1993 for a full description of this piece). I have performed it a dozen times in the years since I composed it, and it continues to evolve.

AN EDUCATIONAL EXPERIENCE

This year, I had an opportunity to expand the concept of computer-aided performance from a solo pursuit to a group endeavour. I teach an advanced seminar, 'Computer Applications in Music', in the Sound Recording Technology programme at the University of Massachusetts Lowell, which is open only to seniors who have a year of synthesizer and MIDI programming under their belts. One of the course requirements is that each student do a large project: a MIDI realisation of an orchestral piece, an original composition that mixes tape or hard-disk audio — or both — with MIDI, a live-performance piece utilising the computer, or a soundtrack (music and effects) to a movie. This year's projects included an arrangement of the 'Danse Infernal' from Stravinsky's *Firebird*, the



“The whole piece took about 15 minutes — and the audience went nuts.”

car-chase scene from *The French Connection*, and a Tom & Jerry cartoon. At the end of the term, we often play the projects in a public concert, in a 300-seat lecture hall equipped with a video projector and a good sound system.

Since no student this year had opted to do a live-performance piece, I decided to create one, and to enlist my students in its execution. In last year's concert I had played the Lennon piece and that had been received very well, so this year I thought I'd do something vaguely similar, based on the work of another one of my musical heroes, someone I knew the students could also relate to: Frank Zappa. So while they spent the term learning about SMPTE placement of sound effects, pitch- and time-shifting algorithms, MIDI automation of DSP, SMDI dumps, and word sync (not to mention

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A TECHNOLOGICAL TRIBUTE TO FRANK ZAPPA

- ▶ dealing with software bugs, hard-disk crashes, and busy signals on tech support lines), I hatched a plot for a complex, computer-assisted, high-energy, visually interesting, audience-befuddling piece that would pay homage to Zappa, while at the same time providing an opportunity for the students to show off their programming and performing skills. Since I planned to use Zappa's tune 'King Kong' as the take-off point for the piece, I would call it *King Frank*.

INPUT AND OUTPUT INSTRUMENTS

All of the students in the Sound Recording Technology programme are well-trained musicians, and my small group was no exception: Brian Calicchia and Todd Baker are guitarists, Claus Trelby is a keyboard player, and Mike Verette and Luis Silva are drummers. So the first decision

to be made was what MIDI controllers to give them, and me. Although I am primarily a keyboard player, I used to play woodwinds, and a couple of years ago I bought, just out of curiosity, a Casio DH100 from the back pages of an American magazine. Although it looks somewhat like a children's toy, it's turned out to be a wonderful tool for generating brass and woodwind parts; I decided to use it. Mike and Luis each got a KAT DK10 drum controller — the school owns one and I lent my own unit to the effort. Claus got to play the keyboard of a Kurzweil K2000, which we own two of. We have but one Casio MIDI guitar, and I gave it to Brian. To Todd I gave the assignment of running the computer, and since he also has some keyboard skills and was particularly interested in learning about new synthesis methods, I gave him our Yamaha VL1.

DESIGNING THE SOUNDS

The Casio DH100 is a curious beast. Like the Mattel Power Glove, which had a very short commercial lifespan but is now in great demand by experimenters as a real-time virtual reality controller, the DH100 never really caught on, and Casio dumped it. A small company in Wisconsin, however, picked up Casio's inventory and still sells the unit at a bargain-basement price. It looks pretty silly, and is built rather flimsily, but, once you get to know it, can be a genuinely useful MIDI controller.

It generates only three types of commands: notes, aftertouch, and portamento. The note numbers are determined by how you place your fingers on the keys, and there are two fingering schemes available: one that closely resembles a normal saxophone, and gives you a two-and-a-half-octave range, and a weird 'binary' sort of fingering that, if it were at all playable, which it isn't, would yield a four-octave range.

You blow into a mouthpiece, behind which is a breath sensor. When the pressure on the breath sensor passes approximately the half-maximum point, a note-on is generated, immediately followed by aftertouch, which then follows changes in your breath pressure. Therefore, you must be blowing to play a note (the breath sensor can be defeated, but that negates the whole value of the thing, doesn't it?), and the initial value of the aftertouch under a note will always be at least 64. The note continues, and aftertouch continues to be generated, until you stop blowing *completely* — if you pass below the half-point threshold, you still get sound. So, while it's not terribly easy to sneak in a note quietly, it is easy to do a long fade on one. Portamento is turned on with a switch by the left index finger.

I created a patch on the K2000 that used the Tenor Sax patch in ROM as a take-off point, assigning aftertouch to the patch's volume, as well as to a filter that provided a little mid-range boost as I blew harder. I also assigned foot controller (MIDI controller number 4) as a second source for the same filter, configuring it to provide a lot more boost, and also to alter the filter's resonant frequency — thus achieving that horrid Ian Underwood late-'60s electric-sax-with-wah-wah sound that Zappa was so fond of. I put the patch into Mono mode, and gave it a portamento range of 70 keys per second, so that I could do little slides or huge swoops, toggling them with the horn's portamento switch.

In addition I used two footswitches to control the pitch, one of which raised it by an octave (1200 cents), and one of which lowered it by an octave. This gave my MIDI horn a range of over four octaves. Interestingly enough, I found that lowering the Tenor Sax ROM samples resulted in a very convincing baritone sax — gutsier and sloppier than using a real baritone sax sample.

Creating the various Zappa-sample patches was a process that began with my going through some of my rather vast collection of Zappa CDs on Rykodisc and Zappa's own Barking Pumpkin label, in my home studio. I had hoped to use the the internal CD-ROM drive on my Macintosh clone to gather the samples, using the 'digital audio extraction' feature built into QuickTime, which allows you to import recordings from an audio CD directly onto your hard disk, with your choice of sample rates, word lengths, and number of channels. I quickly found, however, that this was very cumbersome. The extraction process provides no easy way to audibly cue the CDs — you have to set up the in and out points by specifying timing numbers. If you want to hear the CD, you have to use CD Remote or another software controller, and most of them are clumsy and inaccurate, provide no high-speed cueing, and often have the annoying habit of jumping to the beginning of a track when you're trying to cue backwards.

Fortunately, I have a JVC CD audio player that happens to be one of the few consumer players ever produced with an S/PDIF output. I connected that to the digital input on my Digidesign Pro Tools Audio Interface, and launched *Sound Designer II*. I put the software in Monitor mode to listen to the CDs, and when I encountered a sample I liked, I simply backed up the CD the requisite number of seconds (using a wireless remote, so I didn't even have to sit up) and put the software into Record. *Sound Designer* has the advantage over some audio recording programs that, when you record a signal in mono, it combines the two channels, rather than just leaving one out — since there was no particular reason to record the samples in stereo, I used this feature for all the samples.

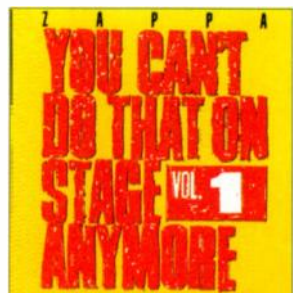
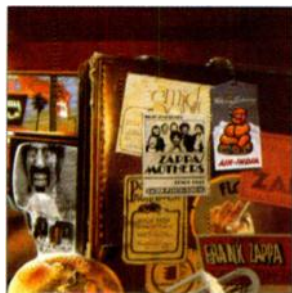
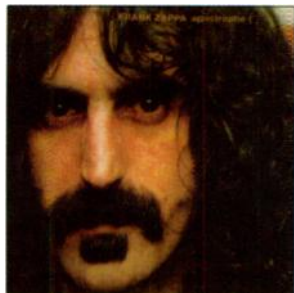
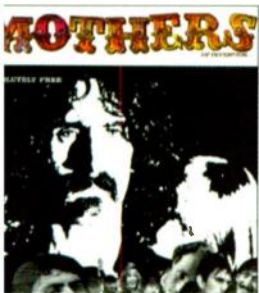
One feature that *Sound Designer* no longer has, however, is a way to send files to an external sampler, and so after I'd collected about 150 samples, I broke them up into sets corresponding to

the five players who would be using them, and brought them into BIAS' *Peak*. There I did some quick trimming and normalising of the files (things that *Peak* is much faster at than *Sound Designer*, due to its working with both RAM and disk files, as opposed to the older program's reliance on disk operations), and sent them over SMDI — the SCSI-based file exchange program used by most sampler manufacturers — to my K2000, through the fairly complex SCSI chain in my studio. The latest version of *Peak* (1.5) allows batch normalising, which saved a lot of time, and, even better, it allows SMDI transfers to be batched, which meant that I could set up the operation, and walk away for 20 minutes, and when I came back all the samples were nicely lined up inside the K2000.

I then created keyboard maps for each player in the K2000 to hold the appropriate samples, and created patches from the keymaps. For the two drummers, I set up the keymaps to match the General MIDI note map built into the DK10s, and also specified what would be ignored — the whole sample would play whenever they hit a pad, regardless of its length. For the others I arranged the samples so that each one covered a range of two or three half-steps; they could then be played several times and each time sound slightly different, since they would be pitched differently. I saved the finished patches, with the samples, to the internal drive on my K2000, and backed it up to a Zip cartridge, formatted for the K2000.

Todd was planning on creating his own patch for SampleCell, so I left the other samples in *Sound Designer* format, and copied them to another Zip cartridge, formatted for the Mac.

I brought my Zip drive and cartridges up to school, and transferred the sample and programme files to the hard disks in the MIDI studio, one of which is used for *Sound Designer* and Pro Tools files; the other is dedicated to the Kurzweil K2000, although they are all on the same SCSI chain. Normally there is only one K2000 in the studio; the other one lives in our 24-track room, but I stole it for this project. After loading one K2000 with samples, the SCSI connector had to be switched by hand to the other K2000, so that its samples could be loaded. We had to do this each time we rehearsed, and before the performance. You can be sure that after we got everything set up for the performance, we guarded the main power switch for the room closely!



For output devices, I used the school's Kurzweil K2000s (each with 16Mb of memory), and my own (with 32Mb). We also have several Digidesign SampleCell cards, so we loaded one of them with 16Mb of RAM and put it into the computer that Todd was working with. Our MIDI interface was a Mark Of The Unicorn MIDI Time Piece, which allows cable routing both into the computer and separately from it (see the 'Routing Around' box). Sequencing and overall control was handled by Opcode's *Vision*, version 3.0.1 (see Figure 5, or page 159). The computer at the centre of it all was a Macintosh Quadra 650, with 24Mb of RAM, running System 7.5.

The sequencer, among other tasks, handled the rhythm section, playing through four MIDI channels on one of the K2000s. Another channel in the same K2000 held individual samples that were triggered at intervals throughout the piece, and a sixth channel was for my MIDI saxophone sound — a Tenor Sax multisample, very much modified and made Zappa-esque (see the 'Designing The Sounds' box). The second K2000 was shared by Claus, who played it in local mode using the Dual Elec Piano ROM program, and Brian's guitar, for which he chose, not surprisingly, the Helter Skelter Guitar ROM patch; the third was shared by the two percussionists. Todd played the VL1 in local mode using the SteamLead factory patch, turning the volume down when he accessed the SampleCell sounds.

Luis and Mike designed drum maps for themselves around the DK10's built-in General

FRANKLY SAMPLING

In addition to the ones mentioned in the main story and the key-mapping illustration, here are some of the other samples we used in *King Frank*, and their sources. All CDs are on the Rykodisc label.

Absolutely Free

'Uncle Bernie's Farm': "There's a bomb to blow your daddy up."

'Brown Shoes Don't

Make It': "Be a joik and go to woik."

Apostrophe

'Don't Eat The Yellow Snow': "Don't you go where the huskies go."

Chunga's Revenge

'Would You Go All The Way?': "Lift up your dress."

Freak Out

'It Can't Happen Here':

"AC/DC" (looped).

'Help I'm A Rock':

"America's wonderful/

wonderful" (looped); "It's a drag being a cop."

'Wowie Zowie': "I don't even care if you shave your legs."

Meets The Mothers Of Prevention

'Porn Wars': "It's outrageous filth."

Overnite Sensation

'Montana': "A pair of heavy-duty zircon-encrusted tweezers";

"Yippie-i-o-tie-yay."

We're Only In It for The Money

'Who Needs The Peace Corps': "Phony hippies";

"Flower power sucks/sucks" (looped, of course).

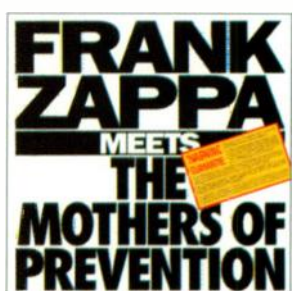
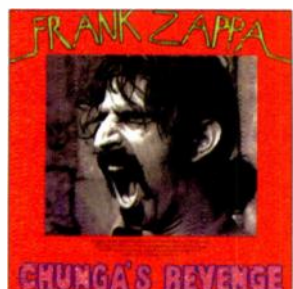
'Nasal Retentive Callope Music': "A little nostalgia for the old folks."

You Can't Do That On Stage Anymore, Volume 1

'The Groupie Routine':

"With a bullet"; "That's me."

MIDI key maps. Since the basic drum tracks were to be played by the sequencer, they could set themselves up with more exotic sounds both from the K2000's ROM and from other sources —



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► congas, timbales, cowbells, shakers, tambourines, giant snares and kicks, and human grunts and sighs, which were samples of their own voices.

THE PIECE

'King Kong' is a fast, modal 3/4 jazz tune which Zappa first recorded in 1968 on the album *Uncle Meat*. A

major portion of *King Frank* was to be straight blowing over 'King Kong', with each of us getting a solo, and the two drummers soloing together. At the beginning and end of the piece, however, and in between each solo, the sequencer would spit out a sample from a Zappa album, more or less relevant to the instrument that was about to solo: for

ROUTING AROUND

All of the instruments needed to be controlled both from the sequencer (mostly patch changes, and in the case of one K2000, the rhythm track) and from a live sound source. With the exception of Todd's VL1 keyboard, which he used to trigger sounds in a SampleCell card during the *musique concrète* section, the output of the input controllers did not need to be fed into the computer.

Rather than use MIDI mergers and splitters, I opted to use the built-in routing features of Mark Of The Unicorn's MIDI Time Piece (see

to the K2000 I was using, with a channel filter put on the input to make sure that nothing leaked out to any of the other channels (see Figure 3). The K2000 responds to non-keyboard (that is, pedal and slider) input even when local control is turned off, so I could plug my three pedals right into the instrument.

Brian's MIDI guitar was routed to the K2000 he was sharing with Claus, also with a channel filter on it. Luis' and Mike's KAT drum pads were routed to their K2000, each on its own channel, and each with a filter. Todd's VL1 was routed into the computer, and he needed to make

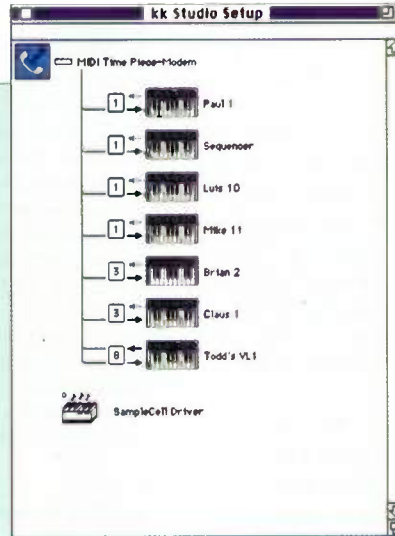


Figure 4: The Opcode MIDI System (OMS) setup for *King Frank* allows output devices to be specifically named in the sequencer. 'Paul 1' and 'Sequencer' (which contains four channels) are one Kurzweil K2000; 'Luis 10' and 'Mike 11' are another, daisy-chained to the first (so they show up on the same cable); 'Brian 2' and 'Claus 1' are a third. Todd's VL1 sends MIDI data to the sequencer to play SampleCell, and gets program changes from the sequencer.

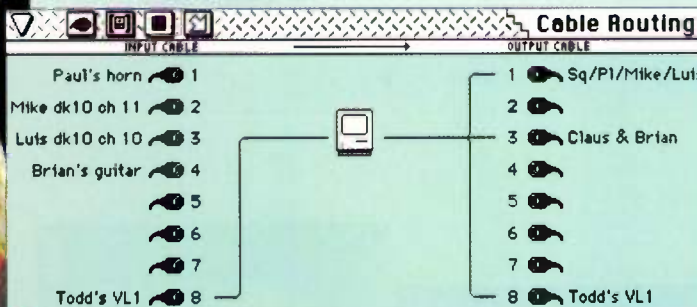
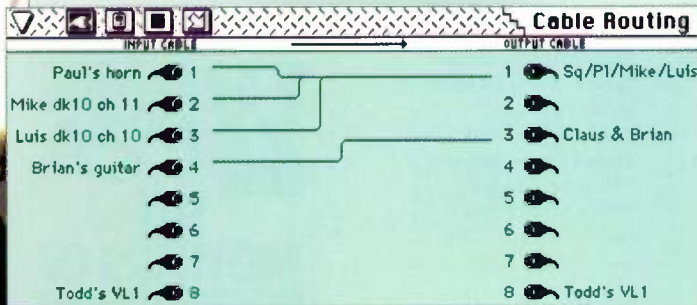


Figure 2: The MIDI Time Piece allows MIDI signals to be routed through the computer, or not. In the top window, the various input devices are routed directly to the synths they are playing (two Kurzweil K2000s are daisy-chained on cable 1). In the bottom window, the VL1 is routed to the computer so it can play SampleCell, and the computer is routed to all of the synths to play the backing sequences and trigger program changes.

Figure 1). I've used the MTP (through three incarnations) for several years, but never had a chance to use this feature. I'm happy to say that it worked flawlessly.

The unit we had available was an original MIDI Time Piece — the more recent devices we have at college were still in use by students finishing their term projects — but it had all the capabilities we needed (see Figure 2). My Casio MIDI horn was routed directly

sure that SampleCell was chosen as the active Instrument in *Vision*, and that Keyboard Thru was turned on (see Figure 4).

The sequencer's MIDI output was routed to all of the K2000s. To save on MIDI cables, the K2000 that was handling my sax and the rhythm tracks was daisy-chained to the K2000 that Mike and Luis were playing. This meant we couldn't use any of the same MIDI channels on the two synths, and that

all of the channels being used on one machine had to be turned off on the other. Since my machine was using a total of six channels and the other one only two, this was not a problem.

K2000s have two sets of stereo outputs, and only one goes through the internal effects chip. To keep the audio paths as distinct as possible — so as to make the life of the department's technical director, Bill Carman, who was mixing the concert, easier — we broke up the outputs of the synths by MIDI channels so that each player had his own stereo feed appear at the console. My sax, for example, showed up at two channels, routed through my K2000's onboard effects chip, which was set to a chorusing delay. The other half of the instrument (the one playing the rhythm tracks) was dry, so we hooked up a Lexicon LXP1 to the board, and sweetened the rhythm tracks with a little medium-room reverb. We could then use the same reverb for the other instruments that came out of the dry sides of their respective K2000s: Claus' electric piano and Luis' drums.

We brought an extra pair of speakers into the lecture hall — the existing system (whose speakers hang from the ceiling) had been fine for playing film tracks and for a single sampler the previous year, but since we were going to mix five instruments simultaneously, I wanted something

beefier. We brought in two Bryston power amps, one for the installed pair and one for our new pair on the floor. The mixing console was a Mackie CR1604 we borrowed from a local dealer. We took advantage of the Mackie's pseudo-4-channel output, and routed the Alt outputs (3 and 4) to the ceiling speakers, and the Main outputs (1 and 2) to the floor speakers. On the board, we assigned

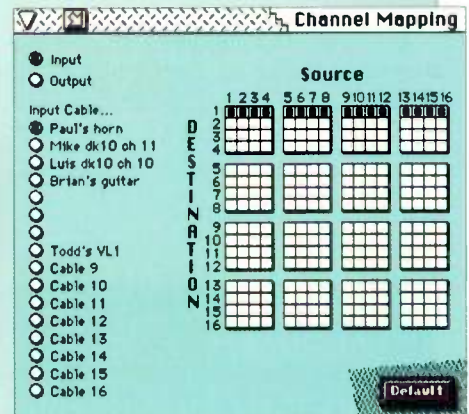


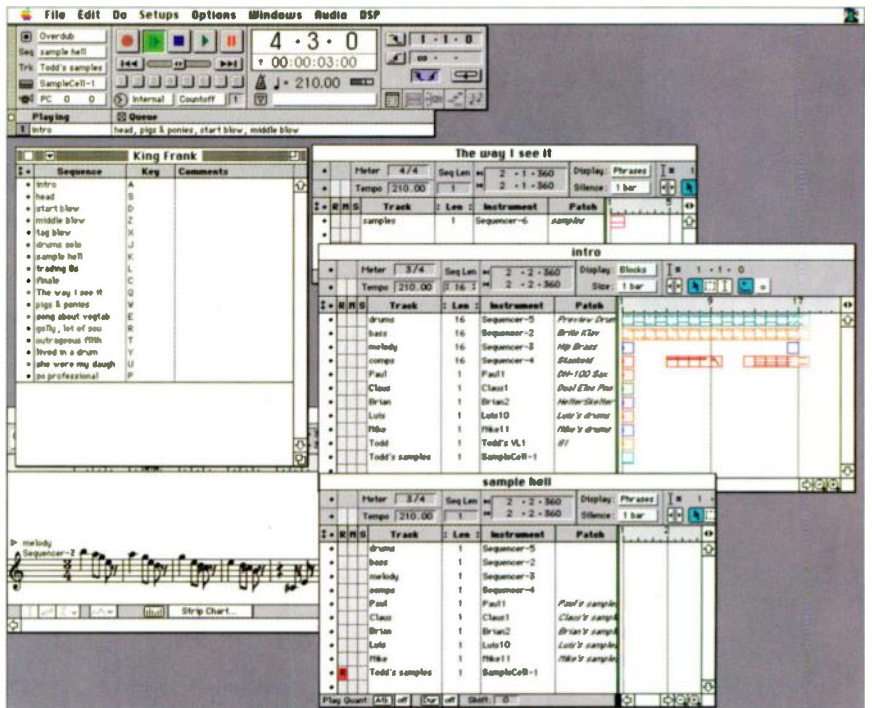
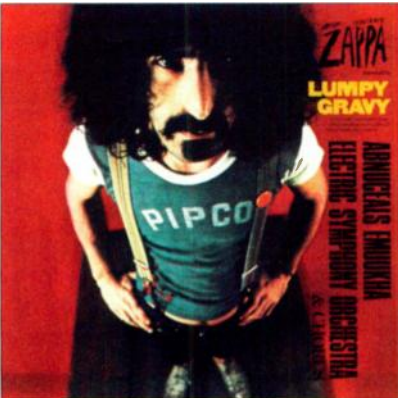
Figure 3: A channel filter is used on the MIDI input from Paul's horn to make sure that it plays the correct channel on the receiving synth, regardless of what channel it is transmitting on. Similar filters are used on Brian's guitar and the two drum controllers.

the rhythm tracks, the piano, and Luis' drums (all the tracks that were going through the reverb) to the main outputs, and everybody else to the ceiling. The coverage was excellent, and the variety of point sources added nicely to the audience's befuddlement.

example, before Brian's hot guitar solo we heard Zappa's pitch-shifted voice saying "Golly, do I have an awful lot of soul", from *We're Only In It For The Money*, and before the drums we heard an unidentified woman saying, "I only dreamt I lived in a drum... ever since it got dark", from *Lumpy Gravy*.

The sequencer played during almost all of the piece. It handled the melody at the beginning and end of the piece (which Brian, Claus, and I also played), and provided a rhythm track under the solos. This consisted of three 16-bar sequences —

a



beginning, a middle, and a tag — containing kick, snare, and ride-cymbal patterns, plus bass, which was simply two tonic notes an octave apart on a Clavinet patch, along with various harmonic accents. For example, the beginning of the first sequence started with a brass fall-off, the middle contained one of Zappa's riffs using a sax section patch, and the tag contained a rising chromatic progression, which made it easy for the ensemble to hear when the sequence was about to end.

The sequences were set up in order by Todd using the Macintosh keyboard and *Vision's* Queue function. The middle section was repeatable, and Todd could determine how long each solo was going to be while it played: if he cued up the tag sequence, it would go to the tag and end, but if he didn't, the middle sequence would loop. The soloists and Todd used eye contact to agree when

Figure 5: Opcode Vision setup for King Frank. Sequences assigned to the lower part of the Mac keyboard are for musical sections; those assigned to the upper row trigger in-between samples. The 'Sample hell' sequence sets all synths to sample-based patches and turns on SampleCell (volume to 127). Keyboard Thru is enabled and the active (Record) channel is set to SampleCell-1 so Todd can play the card live from his keyboard.



Warning.

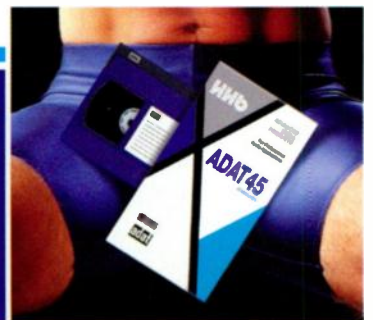
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► a solo should end. The tag sequence ended abruptly, punctuated by a sample, which itself was triggered by a single-note sequence. Todd would then cue the sequence for the next solo manually, using a nod of his head to indicate the downbeat and pressing the appropriate key on the Mac keyboard to start the next sequence.

After the head and the four solos, there was a drum solo, in which the computer played a different sequence consisting only of kick and hi-hat, which looped indefinitely. On a cue from the drummers (who worked out a very tight solo together), Todd would cut off the sequence, and start the next one.

“The variety of point sources added nicely to the audience’s befuddlement.”

MUSIQUE CONCRÈTE

This next section was totally free-form. There were no ‘instrument’ sounds — instead, each player played nothing but samples, either one-shots or loops, created from phrases in Zappa’s recorded repertoire. The sequence had no notes in it: it contained patch changes, to call up custom patches in the K2000s, and a volume command to turn on SampleCell. I gave the group a visual cue so that everyone started playing at once.

Each of us had our own sample set, stored in custom patches in the K2000s or SampleCell. My set, for example, included “Cream Cheese!” and “It can’t happen here” from *Freak Out* and “Oh, my hair’s getting good in the back” from *Only Money* (see Figure 6, below); Brian’s sample set consisted mainly of guitar loops from the *Guitar* CD, along with the title riff from ‘My Guitar Wants To Kill Your Mama’ from *Weasels Ripped My Flesh*; Todd’s

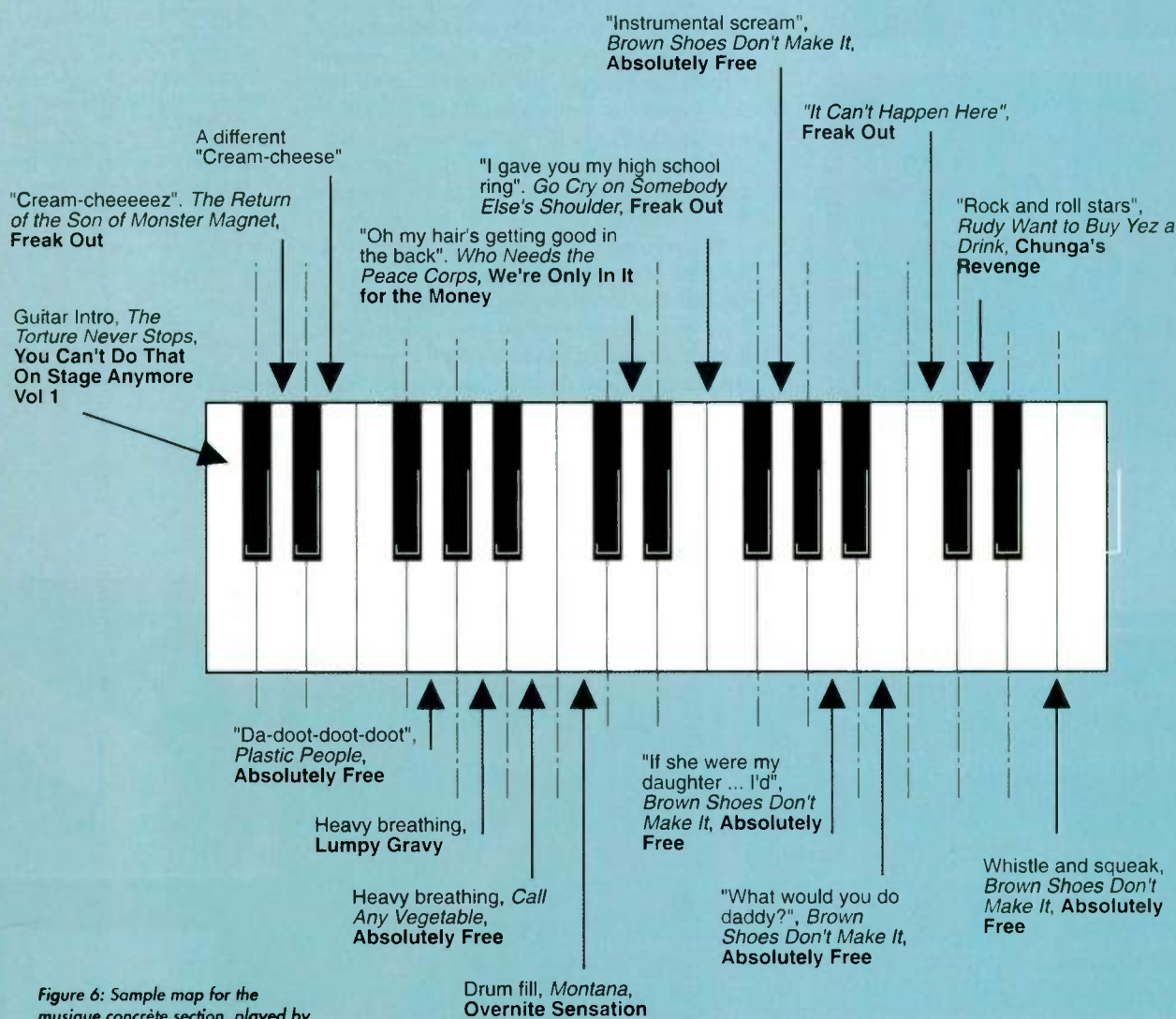


Figure 6: Sample map for the musique concrète section, played by Paul's Casio DH100 MIDI horn.



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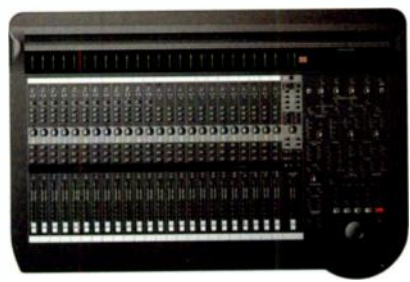
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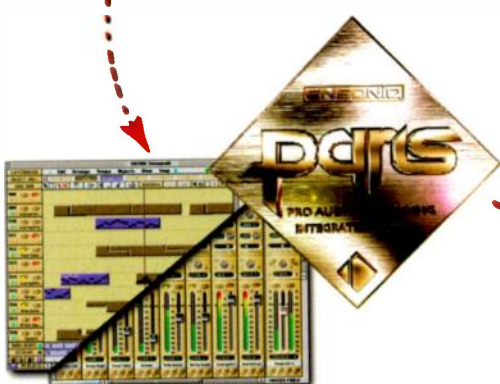
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► included such gems as "Why does it hurt when I pee?" from *Joe's Garage*. Each of us got a palette of about two dozen samples, spread out over several octaves.

After starting the section together, we let it evolve organically — some performers would lie back for a few seconds, and then add something in response to what someone else did. In rehearsing the piece, this was by far the hardest part — not only did everyone have to learn what notes corresponded to what samples in their own sets, but they had to learn not to get so enthusiastic about their sounds that they ended up stepping all over everybody else. We probably had enough samples for this section to go on for half an hour or more, but in the interest of not totally alienating the listeners, we limited it to about two minutes. This meant, unfortunately, that no one got to play everything in their set. Nevertheless, it was a splendid chaotic mess, straddling the line between glorious anarchy and totally indistinguishable noise.

Our cue to end the free-form section was when Mike started pounding out "I can't stand it!" from *Live At The Fillmore East*, faster and faster, which would dissolve into a hideous laugh from *Only Money* in Luis' set, and segue into "This must be the end of the world" from *Lumpy Gravy* in Claus' set.

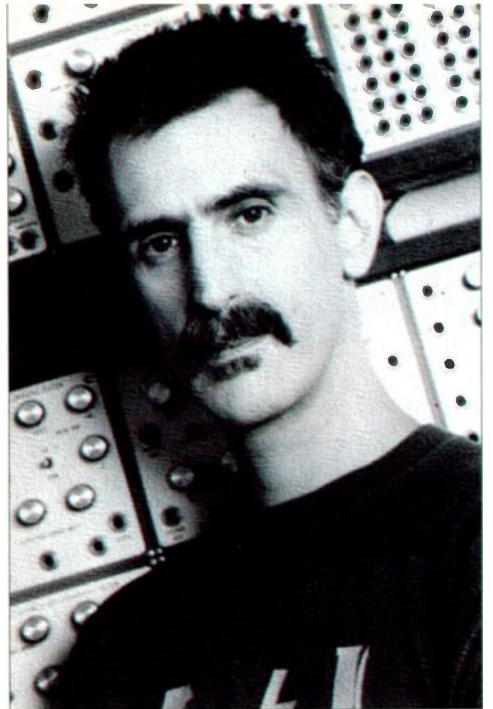
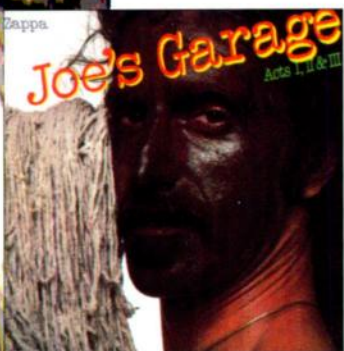
MORE CONFUSION

Todd started the sequencer again, picking up the beat, but this time with drums only. This was a 'trading eights' section, a common technique in jazz, in which each player plays an eight-bar solo over the beat, and it goes around the room, round-robin style. In this case, however, so as to further bewilder the audience, the instrument sounds that each of us played in this section had nothing to do with the

physical instrument we were playing.

The first solo was Mike's: his drum pad triggered a set of dive-bombing guitar samples from a Steve Stevens CD. Then Luis' drum pad played 'Pop Goes The Weasel' with a trumpet patch, Claus' keyboard played a Jethro Tull-style flute, Todd's keyboard played an elephant-calling French horn, my toy sax played a sitar, and Brian's

"I hatched a plot for a complex, computer-assisted, high-energy, visually interesting piece."



guitar triggered a General MIDI drum kit!

After we'd gone around that way twice, another sample interrupted us, and we played from the top again, finally ending with a sample from 'Do You Like My New Car?' on *Live At The Fillmore East*: "You guys are so professional!" The whole piece took about 15 minutes — and the audience went nuts.

DO IT AGAIN, DO IT AGAIN!?

The students have all graduated by now and gone off to various internships and jobs all over the country, and so it's doubtful we will ever have another chance to perform *King Frank*. But it was a wonderful one-off experience, and taught both them and me a lot about the possibilities, and the limits, of live performance with computers. And we certainly excited and confused the audience. A friend who was there that night, an experienced, well-respected electronic musician in his own right, after hearing the piece, paid me what was possibly the highest compliment I could want. He asked me, "How did you do that?"

SOS

ZAPPALOGUE

Rykodisc have been re-releasing the whole of Frank Zappa's back catalogue, with improvements to both the recordings and the artwork all approved by the man himself before his death in 1993. "We've made every effort to do right by him," they say. Ask them to send you their *Zappalogue*, which gives detailed info on every album and even has an index of tracks.

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At £899, the AN1x is one of the most affordable physical modelling synths on the market — and it's no less than 10-note polyphonic, with a host of features designed to bring out the control freak in you. MARTIN RUSS follows up our exclusive preview with this in-depth studio test.

When I did the preview of the AN1x a few months ago (see *SOS* April '97), the prototype unit was in transit between NAMM and Frankfurt, and so time was short. Even though I'm used to the rigours of limited time being available for a preview, things were complicated because only a Japanese manual was going to be available. I'm still a beginner in Japanese (*Nihongo o amari hanashimasen*), and, as it happened, the manual arrived after the deadline anyway, so the preview necessarily concentrated on what the AN1x was like from the outside, since trying to figure out how something works beyond the sounds and the front-panel controls can be quite tricky. However, I've now spent several weeks with my blue wedge-shaped friend, and it's about time to prise my fingers from it and reveal all.

Writing about the AN1x is not straightforward — if you thought it was just another digital modelling synthesizer capitalising on the current analogue retro revival, you'd miss out on the true appeal of the instrument. Ordinarily, in a review of a synthesizer, I would expect to write mainly about

sounds, feels and behaves just like a real VCF.

But unlike a monosynth, there's rather more to the AN1x than this cursory overview suggests. Firstly, for all but the simplest of operating modes, the AN1x produces stereo sounds. Secondly, the richness of the detailed synthesis implementation is rather unexpected. Having learnt my trade on analogue monosynths such as Minimoogs and ARP Odysseys, the first polyphonic synthesizers came as quite a shock to me, because cost-reduction had forced manufacturers to pare away all but the most essential elements. So single-VCO or (more often, digital-DCO, single-EG-equipped polysynths appeared, often with a simple chorus effect tacked onto the output to try and restore the gorgeous detuned 'rolling' sound of the monosynth. There were exceptions, of course: the Yamaha CS80 cut no corners, and the AN1x follows in its footsteps.

The AN1x is rather more than a simple monosynth. It's more like ten rather well-equipped monosynths. There are two VCOs, with detuning and LFO-driven PWM for smooth, rounded pads and basses, and these can be sync'ed together, so that the slave is forced to operate at multiples of

What Controller

YAMAHA AN1X ANALOGUE PHYSICAL MODELLING CONTROL SYNTH

the sounds and the synthesis technique used, and cover the user interface, MIDI and control functions as part of the panel-control description. The AN1x does not fit into this cosy format. It is quite some time since I last used something where the synthesis method was arguably secondary to user interaction and the control functions — my WX11 wind controller springs to mind.

ARCHITECTURE

The AN1x throws away several conventions about how a synthesizer is organised, and does things in a new and very different way. The distinction between a patch and a performance usually found on modern synths is gone: the AN1x's basic unit of sound storage is a complete snapshot of the total sound — or rather, two sounds, plus all arpeggio, sequencer and other associated settings.

At first glance, the AN1x appears to have virtually the standard monosynth architecture. Two oscillators and a noise source are mixed together and pass through a timbre-shaping filter, emerging from a volume-controlling amplifier. Now I could be pedantic and take issue with Yamaha for calling the Oscillator, Filter and Amplifier by the 'Voltage Controlled'-based acronyms VCO, VCF, and VCA, when the whole concept of voltage control inside a digital emulation is ludicrous. But I can't see any reason to complain about the use of the word VCF for something which, although only a mathematical model of an analogue Voltage Controlled Filter,

the master's frequency, even when the slave's frequency is altered with an envelope, the LFO, or a knob controller. You can also use one VCO to frequency-modulate the other, and, by combining Sync and FM, it's possible to produce some unexpectedly non-analogue sounds. If you've ever used FM on an analogue synthesizer, you've probably been frustrated by how slight imperfections in the VCOs can restrict the usable range of decent sounds to a span of a few notes, or perhaps even just one — and even then the effects of drift or temperature are heightened alarmingly. Being digital, the AN1x's VCOs suffer none of these problems, so the sync'ing and FM functions make the very first part of the sound-creation process considerably more productive than you might have imagined.

The main LFO has a remarkable selection of waveforms — not only the usual sine, triangle, sawtooth, square and sample & hold, but additional ones with DC bias, phase inversion, and an extra sample & hold waveform — that's 21 waveforms in total. The second LFO offers a triangle waveform only, and is intended for PWM control and additional vibrato. By using the so-called 'Free EG' facility (see later for full details), you can record your own synchronous or asynchronous modulation waveforms to control most parameters.

The VCF acts as the focus for the sonic raw material. As well as the VCO outputs (plus some intriguing 'internal' extra waveforms when you use sync), there's a noise generator and a ring

pros & cons

YAMAHA AN1X £899

pros

- 'Analogue' sounds and more — you forget it's digital.
- 10-note polyphonic.
- 61-note keyboard with aftertouch.
- Neat arpeggiator and sequencing.
- MIDI Thru.
- Editable effects.

cons

- User interface is not 'one knob/switch per function'.
- External power supply.
- No computer MIDI interface.
- Way too affordable.

summary
Don't hesitate, BUY!

SOUND ON SOUND



Yamaha AN1x

► modulator. Ring Modulators got stuck in a rut producing Dalek voices many years ago, but, as the CS80 showed, a bit of ring mod can work wonders. The outputs of the VCOs actually have their own 'low-pass' filters, which allow you to pre-set how wide the filter can open, and thus its brightness, and let you balance them against other bits of the mix. The final input to the filter is an unusual one: the output of the VCA. Feedback is normally the province of modular synthesizers, and certainly not polysynths. As a nod to the monosynths of old, the VCF is preceded by a high-pass filter — which allows

Chorus, Flange and other specialised effects; Delay, which gives five Echo and Delay effects, including a delay which is synchronised to the arpeggio or sequencer tempo setting; and Reverb, which provides eight different types of reverb. There is an extra section, which provides 3-band EQ control of the tone of the instrument, but this is not affected by the effects bypass, which might be a trap for the unwary!

FRONT PANEL

I won't bore you with a detailed description of the AN1x's front panel, but its organisation is interesting.

The pitch-bend and modulation wheels are in the traditional 'left-hand side of the keyboard' position; above them is the ribbon controller; above that are the scene switches, and then the volume control. The ribbon controller is a revelation, with a crisp feel that puts it into a different league to the old ribbons found on Multimooogs (it also offers both sideways and pressure sensitivity). The positioning encourages you to use the ribbon with your left hand when you're not bending or modulating.

The eight assignable knobs can be used to control seven pages of synthesizer parameters, plus an eighth page which is

“After years of not understanding why some people raved about

arpeggiators, I have now undergone a revelation — and it came in a wedge-shaped blue plastic case.”

preset to provide some very useful quick edits by Yamaha, but which you can edit to suit your own preferences. The seven pages of programming parameters are much easier to use than you might think, and I soon found myself hopping from page to page without getting lost. But you do need to refer to the front-panel graphics to keep your bearings. The knobs have a built-in switch that you press to confirm where the AN1x thinks the knob is, and you then turn the knob to position the shaded segment to the flashing segment on the display.

The custom LCD is small, but backlit, with a pale green light, and gives plenty of feedback about what's happening inside. Different modes tend to re-use the same bits of the LCD, which isn't as awkward as it sounds — just a bit stingy in these days of huge LCDs. Then again, for the price...

The Program Change keypad needs little ►

The AN1x offers plenty of real-time control options, such as the parameter knobs (top), the multi-directional ribbon controller, and the pitch and mod wheels (left).



FACTORY PATCHES

When you try out the AN1x in your favourite music shop, here are my recommended first stops in your exploration.

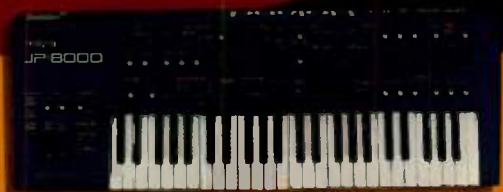
- 001:Co:Relaxx. Try the ribbon controller.
- 011:Sq:Alan. Try assignable knobs 7 and 8, the ribbon, and the morph wheel.
- 017:SQ:Doves. Again, try the assignable knobs 7 and 8, the ribbon, and the morph wheel.
- 021:Co:Vinnie. Pattern pitch shift below the split. Solo above the split.
- 049:St:Analog. Rich and slushy.
- 058:Sc:Dust. Press both Scene buttons to enable morphing. Press the Arpeggio/Seq button. Hold down some notes, and tweak assignable knobs 5 to 8.
- 065:Ld:Hard Sync. Play and use assignable knob 7. Repeat *ad infinitum*.
- 085:Pd:Polyswell. Assignable knobs 7 and 8 again.
- 106:Fx:FreeEGRthm. Just play.

you to remove the low frequencies which can so easily muddy the sound when you mix together lots of low-pass filtered synth sounds.

Filters are personal things. Ladders, state-variable loops, 2-pole, 4-pole and 6-pole variants all go together to produce the characteristic thin and buzzy or dark and moody feels of the analogue filters of old. Yamaha have provided 2-, 3- and 4-pole low-pass filters, plus band-pass, high-pass and band-reject ones. The VCF sounds that most people remember are the strident and synthetic 2-pole 12dB/octave type, and the 4-pole, resonant 24dB/octave type. The AN1x sounds very similar to the real thing in both cases — by which I mean that if I do an A/B comparison with my analogue 24dB ladder filter, I can detect some differences but I'm not sure exactly what they are. Without the benefits of that comparison, the AN1x's filters sound like analogue filters. In fact, as I said in my preview, you very quickly forget that this is a digital instrument. I treated the AN1x as if it were the impossibly perfect analogue synth that I dreamed of all those years ago — and it did almost nothing to shatter that illusion.

These days, no synthesizer would be complete without the obligatory effects section on the output, and the AN1x is no exception. There are three separate sections: Variation, which offers 14 types of

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► explanation, so I'll move swiftly on to the 'matrix' to the right of the keypad: a rotary switch is used to select the row, and ten up-down rocking switches select (and control) the columns. Each cell in the matrix contains a parameter, whose value you can change with the rocking switch. This simple arrangement controls parameters pertaining only to 'overall' functions — arpeggiator and sequencer settings (see later), effects, and so on. The actual sound-tweaking is accomplished via those eight knobs on the far left, which encourage you to make edits. I didn't find the matrix quite so welcoming, and it took me some time to get used to the allocation of



The AN1X's programming matrix.

the parameters to the rows, which isn't completely logical in some places. However, in its defence, the matrix does actually provide you with a map of each parameter, so there's no need to go searching through lots of scrolling menus to find something. You may not even need to do much with the matrix, since the AN1X's comprehensive patch storage means that lots of extra information is stored away with the sound. This minimises the need to change things when swapping from one patch to another.

CONTROL

The AN1X's 61-note keyboard, with velocity and pressure (aftertouch) sensitivity is part of a whole array of real-time performance controllers. Its arpeggiator boasts 30 different patterns, including some which play chords, and others which randomly select notes from those you are holding down. The 16-step sequencer uses the same eight knobs that are used to program the sounds, and allows real-time changes to be made to the sequence that is playing.

Having a short repetitive sequence playing cries out for some sort of slow modulation: filter sweeps, timbre changes, and so on. The AN1X allows you to morph between two sounds as you're playing, and has 'Free EGs' (Envelope Generators), into which you can record your own parameter changes — rather like a dedicated controller recorder. The sequencer provides 128 preset patterns and 128 user memories — and the pattern is stored as part of the patch, so

THE FUTURE

It used to be that Yamaha released the pro/flagship version of an instrument first, and then pared away some of the more esoteric features for the mass-market release. The DX1 followed by the DX7, or the VL1 and the follow-up VL70m are typical examples. The AN1x is evidence of a new strategy — the price, casing, small LCD and lack of memory card or floppy disk drive suggest that this is not intended as a pro/flagship

instrument. When I quizzed them, Yamaha didn't give much away about the future, but from the available evidence of recent releases (VL70m, AN1x, MU90R,) I imagine you can guess what might be likely.

Apparently, the original planned name for AN1x was the CS3x, but the re-naming makes possible a whole new series of 'AN' analogue modelling synths, whilst the CS series can continue with S&S.

that when you select a patch the sequence is automatically loaded and ready to go. MIDI clock sync, looped patterns and syncopated/swing rhythms all make the sequencer a powerful ideas generator. Best of all, the arpeggiator and patterns can be routed to the MIDI output, on the same channel as the main output from the keyboard, or on separate channels. Yamaha warn that using the same output channel for all of these outputs can cause problems, and I can confirm that it is possible to produce 'stuck' notes on external MIDI equipment (even on Yamaha stuff) — so you've been warned! Just about the only thing you can't do with the arpeggiator and sequencer is run them at the same time.

But there's rather more to the AN1X's control feature set than this. Some aspects of the machine's operation are what you might expect: different modes give you variations on Unison, Dual and Split voices, based on the idea of having two different sounds stored as part of a single patch. These two sounds determine how the morphing works, and are called Scenes, so you can have two variations on the same sound by tweaking those eight parameter knobs, or even editing one of the Scenes, leaving the other unchanged, and then mix them, morph between them by using the modulation wheel, and save the edited sound as one patch.

The arpeggiator begins to stretch things a little.



Rear Panel.

You can have the whole keyboard driving the arpeggiator, and either one or both Scene sounds playing the arpeggio. If the keyboard is split, you can have notes to the left of the split played by one Scene sound, whilst the other side of the split plays normally. There are quite a few combinations of splits, Scene assignments and keyboard modes, ►

BRIEF SPECIFICATION

- 61-note keyboard with velocity and aftertouch.
- 10-note polyphony (maximum).
- 2-part multitimbrality (maximum).
- 128 Factory and 128 User presets.
- Arpeggiator with 30 patterns and 10 timing sub-divisions.
- 16-step sequencer with 128 presets and 128 user patterns.
- Free EG controller recorder.
- Effects: Variation (Chorus, Flanger, Symphonic, Phaser, Auto Pan, Rotary Speaker, Pitch Change, Aural Exciter, Compressor, Wah, Distortion, Overdrive, Amp Simulator); Reverb (Hall, Room, Stage and Plate settings); Delay (five types); EQ.
- Scene 1 and Scene 2 knobs.
- 8 assignable control knobs.
- Pitch-bend wheel.
- Modulation wheel.
- X-Z ribbon controller.
- Backlit LCD display.
- Stereo audio output; 3 footpedal inputs; MIDI In, Out, Thru; DC In.
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HIDDEN EXTRAS

For those brave souls out there who like to know everything there is to know about an instrument, there's a hidden 'test' mode in the AN1X, intended for factory and servicing use only. You enter it by powering up the synth whilst holding down the '0', '-', and '+' buttons on the keypad. The '+' button then advances through the tests, and the '-' button goes back. The 'Store' button enters a test routine and acts as the 'Yes' button, whilst the 'Portamento' button exits a test and doubles as the 'No' button. You can do all manner of nasty things with this mode, so don't!

GLOSSARY

Since this review has constantly referred back to analogue synthesizers, this seems like a good point to refresh some of the terms that were in common usage fifteen years ago.

- EQ Equalisation.
- FM Frequency Modulation: a synthesis technique.
- LFO Low Frequency Oscillator: vibrato, tremolo, and so on.
- PWM Pulse Width Modulation: waveshape changing.
- VCA Voltage Controlled Amplifier: volume control.
- VCF Voltage Controlled Filter: timbre control.
- VCO Voltage Controlled Oscillator: sound source.

And how about a term that has been in popular usage for only about five years:

- S&S Sample & Synthesis: sample replay.

but the upshot is that most combinations of sounds, arpeggios and normal playing are available. As with the sequencer, all these settings are stored away as part of the patch.

The step sequencer offers the same sort of flexibility. Although it's only a 16-note affair, you can use keyboard splits to either shift the selected pattern in pitch, choose another pattern, or do both (the left-hand side of the keyboard selects the pattern, the right-hand side shifts the pitch), making it very versatile and powerful. Combined with different loop types (forwards, backwards, alternate, and so on) and Scene sound settings, the sequencer's additional 'feel' controls might be seen as overkill. These control 'swing' by shifting the timing of some beats, or changing the velocity ratio between the highest and lowest velocities (similar to using an audio expander or compressor), or altering the gate time. Wow.

Each sequence step can be entered using the appropriate knob — there are two 'pages' (1-8 and 9-16) for the 16 steps. You can set note number (there's a neat 'extra' here: pressing the knob down to get fine control helps set the note quickly); velocity; gate time percentage (1-200%, so you can force legato playing); and even a MIDI Control Change value to be sent with each step. You can also make the sequencer or the arpeggiator automatically hold given notes, so that you don't have to keep your hands on the keyboard — play along with an arpeggio or sequence with both hands pecking away at the keys.

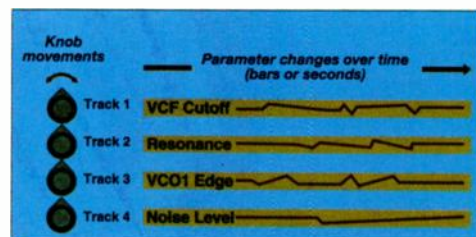
The Free EG is really an extension of the idea of Control Changes in the step sequencer. Imagine having four separate tracks of control information assigned to specific parameters inside the synthesizer, and which can either be sync'd to the arpeggio or sequencer clock, or run asynchronously for a given time and then looped, and you have the Free EG controller (see diagram, right). Tracks can be recorded separately or all at once, and it's surprisingly straightforward to use. Free EG settings and information are, again, stored with the patch, and are very useful for providing evolving or constantly changing timbres.

SOUNDS

In the sound department, the AN1X's basic architecture produces a series of variations on synth brass sounds, with woody basses and clichéd

resonant decaying filter sounds. The sync function facilitates searing lead lines that encourage soloing, and also produces some remarkably bright bass sounds. The FM and ring modulator give you the bell-like timbres and electric pianos that extend the synth's repertoire slightly beyond the traditional analogue synth range, whilst FM and sync, coupled with feedback around the filter, create sounds which are well beyond what I associate with analogue, and more like S&S or even physical modelling. There's rather more to this instrument than slushy pads and resonant sweeps.

And there's more — more than I can include in this review. Don't forget that having two Scenes means that you can not only layer two different sounds, but also move smoothly from one sound to the other. Yamaha told me that they had fixed some problems I reported with the morphing in the prototype, used for my SOS preview; and virtually all of the zipper noise has gone, so the algorithms used to control the change from one sound to the other are now very effective. Wearing my 'picky' hat, I did find one factory sound which had some vestiges of unwanted noise (BR:004 Major Brass), but this was the exception, not the rule. On the subject of factory sounds, I always advocate listening to them with an analytical ear, and then replacing them with your own sounds. Not



Yamaha's representation of how the Free EG works.

bothering to get into programming an instrument like this is almost a crime.

Since those eight little knobs are just waiting to be tweaked, making real-time changes to sounds as you play them is a doddle. I must confess that

COMPARISON: AN1X & CS1X

Because it looks like a CS1x, there are bound to be people who will think that the AN1x is an expanded or cut-down CS1x. In fact, the two are very different in many ways. The outer casing is just about the only common bit. Here's a quick guide to the differences:

CS1x	AN1x
S&S	Analogue Modelling
Sample-based	Analogue emulation
480 patches	128 patches
32 note poly	10 note poly
—	Ribbon controller
—	Arpeggios & Sequences at MIDI Out
Drum sounds	—
2 assignable knobs	8 assignable knobs
GM & XG	—

I've become rather addicted to raising the level of the echoed signal on sync'd lead-line adducts at appropriate moments, and changing the VCF cutoff frequency is such a powerful timbre manipulator that you wonder why it was ever locked away behind displays and parameters. Yamaha have obviously spent some time thinking about how best to maximise the implementation of the eight assignable knobs — so knobs 1 and 2 normally control attack and decay, 5 controls filter cutoff, 6 controls resonance, and 7 and 8 allow control over the effects section. Knobs 3 and 4 are assigned to suit each voice, but they tend to be VCO-orientated. If you're not sure what a particular knob will control, press it twice (almost like double-clicking as you would with a mouse) and the assigned parameter then appears on the top line of the display. Simple, neat, and in these computer-literate times, almost intuitive!

THE MANUAL

Yamaha's manuals have been very similar for many years, so this one came as a complete surprise to me. It looks more like a magazine than a manual, and it has colour adverts for the MU90R, EMX640 and A3000 as part of the cover. Inside, the 122 pages start with an overview, then run through the instrument in more detail, describing how to approach learning how to work with it. Then there's a detailed description of each function, followed by examples of how to program a few sounds. The whole thing is chock-full of little notes, hints and tips on how to do useful extra things. Overall, it's one of the nicest manuals I've seen in some time, with a clarity that belies the complexity of what is being described.

AND SO...

The AN1x is the first synthesizer in a long time that grabbed me, shook me, and screamed "Play me!" rather than whispering "Hey, I'm a technically sophisticated synth programmer's dream". It's definitely a player's instrument, and, although there's plenty there for a programmer to work with, I suspect that the distraction of interacting with it is going to make anything other than quick edits rather hard to accomplish for many people. After years of not understanding why some people raved about arpeggiators, I have now undergone a revelation — and it came in a wedge-shaped blue plastic case.

At the price, the AN1x has to be a dead cert for a runaway success. I only hope Yamaha are ready for hordes of performance-frustrated keyboard players descending on their dealers and demanding one.

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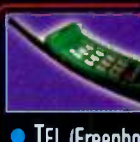
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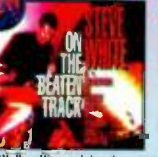


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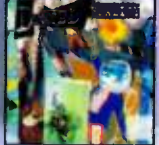
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Volume 3 in the 'Altered States' Series from Zero-G is a stunningly innovative CD that utilises raw and organic sources for the creation of rhythms and soundscapes which will appeal to everyone looking for a creative edge. Loops are accompanied by the individual components allowing infinite variation, plus lots of exciting single hits and ambiences. All material is 100% original, gathered from unlikely sources such as theme parks, factories and industrial sites. Fields of Motion is for the kind of samplist who hungers for inspiration to take their music into the 21st century. N.B. THE CD-ROM VERSION COMES WITH THE AUDIO VERSION BUNDLED FREE!!

PRODUCT OF THE MONTH

REVIEW: "A truly unique product which takes a brave (and wholly successful) step towards providing a good fusion of dance and industrial styles of music... the selection of usable sample material will keep even the sampling die hards busy until Christmas...fantastic range and depth... innovative and unusual... new and exciting sonic sculptures... a rich seam of dance floor and jungle influence... a scorching collection of "happening" dance loops... The layout of both the discs and the sleeve notes couldn't be more logical... a vast resource of 'technical' sounds to provide that elusive sparkle to your percussion tracks... In short. Pure metallic, steam-driven wonderment. **** Five Stars" (Sound on Sound).

Available NOW! CD-Audio: £59.95. Akai S-1000 CD-ROM 2-disc set (includes audio CD): £119.00

Spectrasonics (USA)



DISTORTED REALITY
Cutting Edge Textures, FX and Loops from the labs of top Hollywood sound designers and techno-heads. From 3D atmos transformed via Harmonic Morphing, to incendiary fuzz mutations. Trance-inducing ambiences, 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. Audio CD: £59.95. CD-ROM: £119.00



LIQUID GROOVES
Grooves that have existed only in your imagination. Fluid rhythms forged by a synthesis of propelling live drum grooves and unusual, organic percussion loops performed by some of LA's most creative session players. Unique sonic textures! State-of-the-art instruments such as Korg Wavedrum™. The full-blown CD-ROM version (organised to make mixing & matching effortless) includes a wider selection of grooves & killer Wavedrum™ single hits. The liquid concept is two-fold: Sparse "hand-played" grooves that feel great, combined with focus on uncharted sonic territory. Another inspiring & unique library from Eric Persing to reinforce Spectrasonics' reputation as second to none. Audio CD: £59.95. CD-ROM: £119.00

Zero-G (England)



CUCKOOLAND VOL. 2 "GHOST IN THE MACHINE"
'Ghost in the Machine' is the second title in the Zero-G 'Altered States' Series, and the second title by the CuckooLand team. It delivers everything you'd expect and more from this innovative and highly acclaimed production team! Dark & menacing mind-altering ambiences, heavenly pads, extraordinary arpeggios... this CD is packed full of some of the most amazing textures & effects ever created. Lie back, shut your eyes, and let the ghost take control... "Very bizarre... a multitude of creative possibilities... you can't get much scarier than this monster" (The Mix). Audio CD: £59.95.

A.M.G. (England)



BLACK II BLACK KILLER VOCALS VOLUME 3!
AVAILABLE NOW!
Yet another 2-CD package of almost 2000 vocals from McIntosh & Charles - this is the third and final part of this five-star international smash hit series. CD 1 features hooks in a similar vein to volumes 1 and 2. CD 2 runs for almost an hour, and features 'Percussion vocals', Vocal Fills, a DJ section, Ragga section, and a section of advanced chords. SO DON'T MISS THE THIRD AND FINAL PART OF THE BIGGEST AND BEST VOCAL COLLECTION EVER RELEASED! Audio CD: £59.95

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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, Bases, 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



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Zero-G (England)



VOCAL XTC
Brand NEW and EXTREMELY HOT dance vocal sample collection from ZERO-G (UK), performed by some of the hottest session singers from the UK! Totally original and professional vocal samples for all your music productions, including: Gospel choir, Ad-Libs, Melodies, Harmonies, and Backing Vocals. Styles featured include: Dance, R'n'B, Soul, Rock, and Indie. Both Male and Female singers. The unique vocals on this Brand New release cover a wide spectrum of application and are destined to appear in many a chart record in the near future. Release date: August 1997. CD-Audio: £59.95

A.M.G. (England)



TERMINALHEAD: UNDERFIRE Vols. 1 & 2 (AMG). Futurefunk - current & inspiring. "There are no rules. No BPMs. No keys. Only the need to push the boundaries of perception into ways of creating music for tomorrow that fully embrace all technologies. This material is totally unique". • Drum Loops & Chops - distorted, filtered and phat. (Warning - some of these sounds are REALLY hard) • Synth Riffs/ Sounds/ Sequences created using old analogue boxes • Funky Hard Chops - hard as nails, but smooth as silk • Dub FX • Pascal Benadjouad Percussion grooves • Trippy Oddness • Guitar FX • Synth FX • A collection of filter sweeps and beautiful organic moments. All samples are specially recorded. Two Audio CDs: £59.95 each.



NEW! BLACK II BLACK Vol. 3 (AMG). Steve McIntosh & Joe Charles have done it again! Another mindblowing set of kickin' R+B samples. All the loops, Vocals, Brass lines, & Drum hits specially recorded. The series features: Reggae, Ragga, Swing, Jazz house, Euro house, Mad house, Slo jamz, Rap, Guitar licks, Bass lines, Garage, Disco, and more. REVIEWS for Vols. 1 & 2 said: "Mostroously funky, soulful rhythm loops... highly recommended for teachers of contemporary arranging" (Keyboard, USA). ★★★★★ 3/4 (Sound on Sound). Volume 3 is even BETTER! Audio CDs: £59.95 each volume, or Akai CD-ROMs: £149 each volume. Vol 3 release date: Sept '97.

Big Fish Audio (USA)



LOOPZILLA 3
The third in the Loopzilla series from BIG FISH AUDIO (USA) is here! Again it's a huge 2-disc audio CD set. It's been twelve months in the making but the wait is over!
Now Loopzilla 3 busts out of the cage with 140 minutes of brand new drums, guitar, bass, rhodes, vocals, horns, turntable wizardry and much more.
From mad hard Hip Hop Funk to silky Hip Hop Soul - it's the quality that makes all the difference. Featuring the veterans of Loopzilla 1 & 2 plus new talent from Boo Ya Tribe and The Dazz Band. Get your groove on with Loopzilla 3. Two-CD-Set. only £69.95



FREAKY JAZZY FUNKY
From Rich Mendelson, the five-star producer of Phat & Phunky and Dance Industrial, comes the new standard in construction kits. Rich assembled the East Coast's premiere session talent and contributed his own amazing production and programming skills to make this set his best yet. With the included midi-file disk, it's a breeze for the producer to customize the loops and swap sample elements. Exploring the funky side of dance music, Freaky Jazzy Funky is the set to beat for 1997 and with three CDs and a Midi file floppy disk, this collection has to be one of the industry's best value products! The best ears at T+S rate it a total winner. Triple-CD-Set (Audio): Only £79.95

Ilio Ents. (USA)



DOUBLE PLATINUM ROCK PIANO
Finally, a piano that doesn't require tons of EQ, compression and effects to be heard. The one & only true Rock piano disc, with all of the natural brightness and depth you need to speak through your tracks. The piano is a rare and famous vintage Steinway B, custom rebuilt & maintained strictly for studio recording. Its contribution to Rock history is etched in stone (incl. multi-platinum records from Elton John & Tom Petty to Carl Perkins and Johnny Cash). Chronometrically sampled (at 88 keys), three velocities, looped & non-looped, up to 64 MB banks. The best two-fisted piano sound in the world captured on one easy-to-use CD-ROM. The best piano sample I've ever heard. This is really great! - Matt Rollins, legendary US session keyboardist. CD-ROM £99.00. (Choose from: • Roland • AKAI/EMU/ASR • SampleCell • Kurzweil)

Promotion

FREE WHEN YOU BUY AN A.M.G. CD*

The brand new AMG demo CD "Promotion" - a riveting collection of samples from many AMG products, including: Black II Black Killer Vocals, Keith Le Blanc II, Karma Chopra, Tony Mason Smokin, Abracatalla, Pascal's Bongo Massive, Tim Farriss, DJ Papa Large (Hot & Sweaty House Cuts), and Blackbeat. Plus! - lots of exclusive samples that don't appear anywhere else from: Black II Black, Terminalhead, Sample & Hold, David Ruff's Drums II, and others. This is a huge and valuable collection of pro samples and it's FREE when you buy an AMG sample CD. (*Offer limited to one per household, while stocks last.)

JUNGLE WARFARE

NEW! Volumes 2 & 3! If you need Jungle these 3 CDs from ZERO-G are simply unmissable. Each CD features a MASSIVE set of: • Loops • Rolls & fills • Perc Kits • Pads & Chords • Bass • FX • Vocals. Volume 1 is one of our all time best selling sample CDs. Vols. 2 & 3 are even BETTER! REVIEWS of Volume 1: "Excellent fidelity, balance & punch, & variation in feel & sound... there's no serious competition. Rated 5 stars out of 5 ★★★★★" (Sound on Sound). "Kicking grooves... a wide range of styles... highly useful... AS UP-FRONT AS YOU CAN GET." (The Mix). "Jungle Warfare gives you just about everything you need to survive in the remix rain forest." (KEYBOARD, USA). CD-Audio: £59.95 each. Special offer for limited period only: Get Vols 2 & 3 together for only £99.00 - AVAILABLE NOW!

SAXOPHONE LEGACY

Performed by Sonny Simmons, Volume 1 in the NEW Zero-G Jazz Quartet Series - the next best thing to having the world's greatest jazz musicians come to play on your session. Here are thirty-one performances covering eleven styles of music - nearly seventy minutes of riffs and improvisations by one of the true masters of the alto saxophone. All of the performances on this CD are 100% original & copyright clean. Styles features include: • LATIN • FOLK • BLUES • R&B • REGGAE • ROCK 'N ROLL • FUNK • HARD ROCK • JAZZ • HOUSE • ACID JAZZ

Available from end of July '97. Audio CD: £59.95.

SYNCLAVER 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, Gongs and more! Accompanying manual gives loop points for every sample so it's extremely easy to loop samples quickly and effectively. Each Audio CD: £69.95. (See also our Catalogue, or call us, for full details of CD-ROM versions).

Zero-6 (England)



NEW! VIDEO SAMPLE CDS THE VIDEO CREATIVE ESSENTIALS SERIES

ZERO-6! Yes, VIDEO! NOW YOU HAVE ALL THE MATERIAL YOU NEED TO create STUNNING futuristic visuals to accompany your music. The state-of-the-art video clips on each CD-ROM in this pioneering series will open in a variety of programs and applications that are compatible with QUICKTIME movies. For example:

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Zero-6 (England)



OLD SCHOOL FLAVOURS A High Calibre 4-CD series of loops/samples from ZERO-6, produced with a retro authentic feel. Each of 9 vintage kits plays 5 AUTHENTIC song patterns, each at 2 different speeds, 10 BPM apart, for maximum flexibility. Each song performance is divided into 3x4 bars of groove. *Main groove (chorus). *Simpler version (verse). *Full on Syncopated Breakdown, with each section ending with it's own fill. Grooves are accurate in both playing style and the sound of the kits. Over 1000 bars of grooves on each CD. Each kit is also presented as individual hits.



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Music Mind (Denmark)



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Best Service (Germany)



VOODOO ELEMENTS (CD-ROM for PC) This extraordinary CD-ROM for PC contains comprehensive archives of 200 fascinating drum and percussion loops, ceremonial chants and shouts and more, from the mystical realms of another culture, taken from the Best Service audio CD 'Voodoo Grooves'. An arranger program enables you to combine the sounds of this CD to create new rhythms. All recorded in Africa specially for this CD. Special bonus: videos of Voodoo Ceremonies filmed during the recording sessions! CD-ROM for PC £19.95



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FOSTEX D90 HARD DISK 8-TRACK RECORDER

Fostex take their stand-alone 8-track hard disk concept onward and upward, turning the well-received D80 into the D90 with some useful and welcome enhancements. PAUL WHITE is d-lighted...

It seems that a lot of people would like to make the transition from tape to tapeless recording, but some perceive the computer environment as over-complicated or unreliable. Though numerous other companies produced stand-alone hard disk multitrack recorders before Fostex did, Fostex were one of the first to address this problem in a way that was both straightforward and affordable, making their DMT8 multitracker (reviewed *SOS* December 1995; VL version update December 1996) and the D80 stand-alone 8-track recorder (reviewed *SOS* June 1996) popular with those who wanted solid performance on a tight budget. The new D90 is not a revolutionary product, but rather evolutionary, in that it builds on the success of the D80 by adding new user options and features, an ADAT interface and a removable drive system. Multiple D90s may also be locked together when more tracks are needed. It can record on all eight tracks simultaneously and has comprehensive MIDI options, including integral MTC generation for sequencer sync purposes. As with the other machines in the range, recording is 16-bit at 44.1kHz without any form of data compression, and in this model, there's also the option to work at 48kHz (for use with ADAT), and to varispeed the machine by up to 6% in either direction.

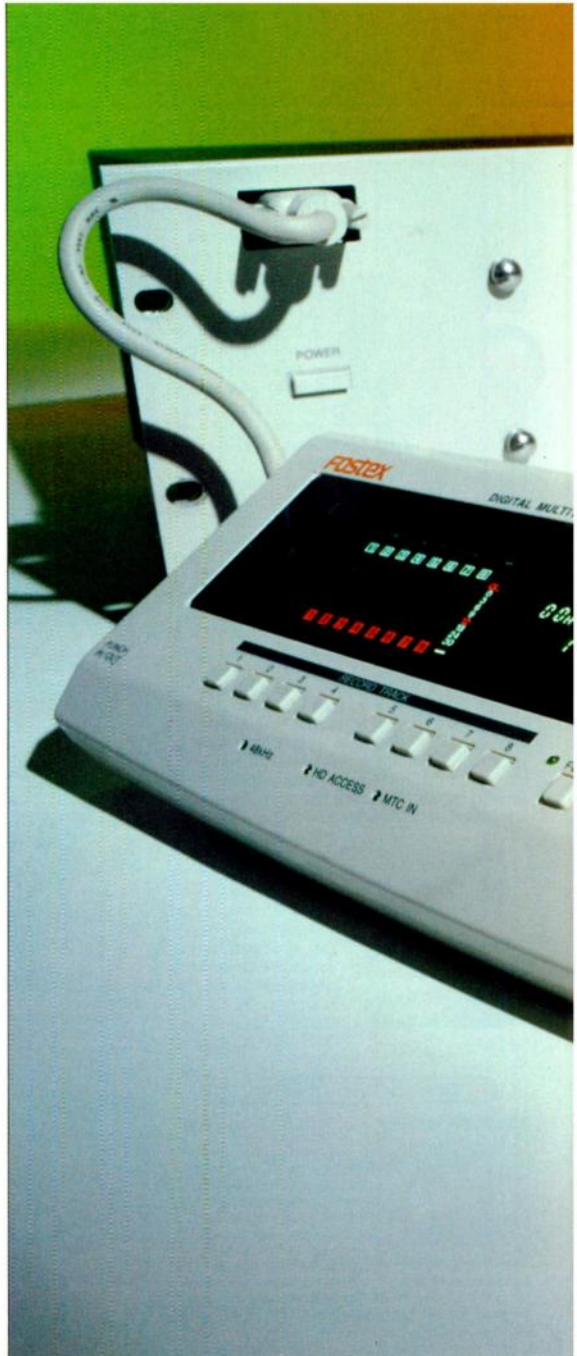
THE D90 PACKAGE

The D90 is a 3U, rackmount 8-track recorder capable of recording or replaying up to eight tracks at once using an 850Mb, IDE hard drive as a storage medium. On this model, the drive is fitted into a removable tray for easy replacement and an optional 1.3Gb drive provides up to 30 minutes of recording time; the standard drive gives around 20 minutes of recording. Other recommended drives are listed in the manual, the largest being a little over 2.6Gb.

The drive bay itself is located on the front panel of the main unit, and the control panel, which also includes metering, is detachable. Using optional multicore extensions, the control panel may be used up to 10 metres from the main unit. Unbalanced phono inputs and outputs are provided as standard, and there's a pair of ADAT optical ins and outs as well as the usual MIDI In, Out and Thru sockets. Two blanking panels on the rear of the unit may be removed to fit a SCSI option (25-way 'D'-connector) and a set of electronically balanced analogue ins and outs on XLRs. Using the SCSI option, any suitably specified external SCSI drive, either fixed or removable, may be used for loading and storing data.

FORMAT

Like previous Fostex hard disk recorders in the series, the D90 operates as a virtual tape machine, in as much as that the maximum recording time assumes



that all eight tracks will be used — you can't, for example, record for twice as long by restricting yourself to four-track recording. The space on the disk is sub-divided into a maximum of nine 'projects', each of which may be of any length, with the proviso that their combined length does not exceed that of the total recording time. Each project would normally be used to record one song and, in addition to the audio, locate points and other data are also stored.

Fostex still persist in calling their D-series machines non-destructive digital recorders, but this isn't strictly true. Unlike more sophisticated systems that use a playlist system, when data is copied, moved or deleted in the D90, it really is copied, moved and deleted, just as it would be on a tape machine. In other words, if you want to use the same chorus ten times in a song, you have to make nine further copies of the original in the desired locations, overwriting anything that was previously at those locations. This simplifies operation, but doesn't conserve disk memory as well as playlist-based systems. The majority of functions can be undone if they don't work out, providing there's sufficient disk space left for the machine to

pros & cons

FOSTEX D90 £1499

pros

- One-box solution to hard disk multitrack.
- Better sound quality than most soundcard-based computer systems.
- Useful range of features and interfacing facilities.
- Generally easy to use.

cons

- The manual could be a lot shorter and a lot clearer.
- The plasma display often displays cryptic characters that aren't immediately obvious.

summary

If you liked the D80, the D90 offers more features, more flexibility and more options for relatively little extra cost. It provides a very straightforward and cost-effective way of getting into tapeless recording, and you generally won't have to worry about needing external sync boxes.

SOUND ON SOUND



“For all practical purposes, the recording quality is as good as DAT or ADAT, punching in and out is seamless,

and the most commonly executed functions are reasonably straightforward.”

create an undo file, and I assume that this is what Fostex mean by non-destructive. As with the D80, the editing functions are pretty basic by digital standards, but they do allow most musicians to achieve the majority of what they're ever likely to want to do without undue complications.

Basic editing revolves around copy and paste, move and paste, cut, and erase, all of which may be referred to absolute time, MTC or MIDI bar and beat locations — the latter providing you're using the tempo map facility. Data being copied or moved is handled by a clipboard system, which, as far as I can deduce, stores the in, out and track number details of the source material rather than the material itself. Undo cancels the last edit, and Redo cancels the last Undo!

Backing up is a major concern when using hard disk systems, but in this case, data may be stored to a DAT machine (the machine must have an optical digital interface or an S/PDIF interface, plus a Fostex COP1 optical to S/PDIF converter); to an ADAT; or, if the SCSI interface is fitted, to a removable drive. Backed-up material may then

be loaded back into Programs 1-9 of the internal drive — Programs are really just convenient ways to keep all your songs, and their settings, separate and safe from being overwritten.

USER INTERFACE

All the controls are to be found on the detachable front panel, though this may be left in place if remote operation isn't required. A large custom fluorescent display presents metering for all eight channels, along with a time readout and edit information, while a jog/shuttle dial aids location and cueing. For the most part this is effective, but some of the displayed text is difficult to read, and often contains substitute characters when the display can't manage to create the letter it needs. For example, MTC comes out as a lower case 'n' with a bar over it in place of the M — hardly intuitive.

The shuttle part of the dial provides up to 20x normal speed cueing in seven speed steps, and the jog section provides digital scrubbing for locating precise edit points without changing the pitch of the monitored sound. Parameters may also be recalled

FOSTEX D90



The D90's back panel, now with built-in ADAT interface. This unit has the SCSI option fitted (top right).

▶ and data entered via this dial. Obviously a hard disk machine can locate to any point in a recording within milliseconds, but to retain an analogue feel the D90 'fast winds' at 30x play speed, and there's also a 5x cueing facility accessed by pressing both Play and Wind/Rewind. Punching in and out may be manual or automated, but for me the rear-panel footswitch jack, enabling an optional footswitch to be used for hands-off punch in/out, provides the most friendly way to work. As you'd expect, punching in and out is both seamless and gapless.

An important benefit of the D90 is that, in addition to the analogue inputs, it can also record data from a digital source via the optical interface, and both ADAT and optical S/PDIF data can be accommodated. The machine supports both 44.1kHz and 48kHz sampling rates, and the same optical connector is used for both S/PDIF and ADAT data formats. Before recording, it's necessary to select a Program to record into, which may be done by depressing the Hold button, then using the Store key to step through the Program numbers. It is also important to manually set the sample rate of the D90 to match that of the source, and different Programs can be recorded at different sample rates if required. This information is stored as part of the Program.

The type of digital input is selected in the Setup

menu, one of the three main display modes selected by means of the Disp Sel button. If the source is an ADAT, the ADAT tracks 1-8 correspond with the D90's tracks 1-8. One of the great advantages of the ADAT interface is not just that you can connect the machine to an ADAT, but that the D90 can also be integrated into a digital system where the mixer has an ADAT-standard digital interface. If the source is S/PDIF, the left and right channels can each be routed to any of the eight D90 channels. The S/PDIF output can select any track pair for output.

To reset a channel for analogue input, it is only necessary to ensure that it isn't assigned to a digital source. Also in the Setup menu is the master/slave status of the machine for multiple-machine operation, device ID number, sample frequency IDE/SCSI drive selection, and other basic options. Selecting a track for recording follows the usual rules of arming the track via separate Record buttons for each track, and putting the machine into input monitor mode for armed tracks is simply a matter of pressing Record twice.

OPERATION

Basic operation is very much like a tape-based multitrack machine, but of course the 'rewind' is much faster. Most functions are straightforward, but I still feel that the procedure for storing in and out locator points for the auto-punch-in mode is unnecessarily-long winded, involving, as it does, pressing the Store button first to grab the necessary time value, then pressing the Auto Punch In or Out key to assign it to the appropriate in or out locator memory. If the punch in and out points are very close together, this is simply too clumsy — a system requiring only a single button-press for each point would have been rather more satisfactory.

The same is true of selecting start and end points for edit selections. But, this aside, you have everything you need — auto looping, adjustable pre-roll, and a rehearsal mode to let you hear the effect of your punch-in before you commit yourself. This all works extremely smoothly, and my only minor whinges are directed towards the occasionally cryptic display and the fact that the control buttons look too much alike. For example, Locate could usefully have been made a different colour or size to the other buttons. I'd also have liked record-ready warning LEDs directly over the arming buttons, rather than only at the bottom of the level meters — which aren't aligned with the record buttons. However, the lack of multi-function buttons is laudable — you have to depress two buttons at once to get to some functions, but that's about as complicated as it gets.

Though not exactly silent, the disk drive in the D90 is reasonably quiet, with only the faintest of clunkings and whirrings to betray its existence. Even so, you wouldn't want to have a sensitive mic right on top of it, which is why the remote front panel is such a good idea for solo recordists. Project studio owners will also appreciate the direct MTC output for syncing sequencers, something that ADATs still need outside help from a BRC or similar to achieve. Though

MIDI SYNC

A D90 internal tempo map can contain up to 64 tempo changes, and, once the tempo map has been created, the D90 can send MTC (related to absolute time, with up to six hours offset) to sync a sequencer or other MIDI device. Alternatively, MIDI Clock (with Song Position Pointers) can be used to sync those systems not compatible with MTC, and the D90 fully supports MIDI Machine Control. To allow time for sync to occur, the D90 is set up so that ABS 0 occurs a couple of bars before the song start point, so that by the time the song start is reached, the external device should have had time to sync up.

MTC is also used when multiple D90s are required to run in sync, with the units being daisy-chained via both their MIDI and optical data sockets. Engaging Chase Lock ensures that all the machines in a multi-machine system are completely in sync during recording and playback, though if an error of greater than 10 frames is detected, the slaves will be muted and a re-chase operation actioned until sync is restored. According to the manual, this doesn't normally happen, but as we

only had one D90 for review, there was no means of testing the effectiveness of locking multiple machines, other than with an ADAT.

To sync to an ADAT, both MIDI and optical data connections are needed, which is why the Fostex RDS provided a convenient way to test the system, though we also confirmed that users of conventional Alesis ADAT or ADAT XT machines can lock up via their BRC remote controls. Perhaps the inclusion of an Alesis-style 9-pin sync interface would have enabled D90s to behave as virtual ADATs in non-BRC systems? It seems odd to have come so close without providing full ADAT emulation.

The D90 is perfectly able to slave to an external MIDI device capable of providing MTC, such as a sequencer. For this to work, the D90 must contain a recording, even if only of silence — if there's no recording, the machine can't sync. Once in sync, the real recorded parts can be added and the blank audio track or tracks overwritten. For MTC lock to be maintained, the source speed should be within plus or minus 5.6% of that of the D90. Outside these limits, chase lock sync cannot be maintained.

low-cost hardware does now allow MIDI sequencers to integrate audio with multiple outputs, the sound quality of systems with on-card converters doesn't come close to what you can get out of the D90, especially when it comes to dynamic range and background noise. Though some cards have on-paper figures that get close to the D90's 92dB, in a real-life installation the figures are likely to be tens of dBs worse than this, and most cards we've tried so far have been hard pushed to produce better than a 60dB signal-to-noise ratio.

For all practical purposes, the recording quality is as good as DAT or ADAT, punching in and out is seamless, and the most commonly executed functions are reasonably straightforward. More advanced sync scenarios, such as running multiple machines or integrating with ADATs, requires a bit of careful manual reading, but the information is there if you look hard enough — it's just that it could have been presented a lot better than it is. If there's a downside to the actual operating system, it's that editing is really destructive, so you can't conserve disk space by re-using the same section of a track again, as you can with a true playlist system, and aside from one level of undo, you can't get back to an earlier point in a project if things start to go horribly wrong. Even so, that's still one stage of undo that you don't get with a tape recorder, and even though you can do copy and paste editing between a couple of ADATs, it's much faster with the D90, and you only need one machine to do it.

Thanks to my friend Paul Joyner, I was able to verify that the D90 slaved OK directly to his Fostex RD8 ADAT machine, but the manual doesn't make it obvious that the slave machine needs to be set to Chase mode — otherwise MMC will start it playing, but it won't find the right position. It also proved straightforward to pass ADAT recordings to and from the D90 via the optical interface.

SUMMARY

Price restructuring means that the D90 isn't much more expensive than the D80 originally was, yet it contains a number of genuinely useful enhancements, the most notable of which are the SCSI option, the removable drive, the ADAT interface, and more flexible sync options. I'm particularly enthusiastic about the inclusion of an ADAT interface, and it's also useful that D90s can sync in both master and slave modes. The flexibility available from combining multiple D90s or a mixture of D90s and ADATs in a synchronised system is extremely welcome, as it allows ADAT data to be lifted off, edited, and then replaced to tape relatively simply.

The basic principle of operation remains the same as for the D80, however, and I feel that, for a great number of users, this relatively simple approach is absolutely right, though both the display and the manual could be more friendly towards inexperienced users. The way in which the punch-in and -out points are stored could also be improved, and the buttons could be better differentiated, but most operations are reasonably intuitive.

For 16-track work, you could link two D90s, though I'd be tempted to hold out for the forthcoming 16-track hard disk recorder from Fostex (the D160) if that's specifically what you need to do. However, if you need a stand-alone 8-track tapeless recorder that combines simplicity with flexibility and great sync facilities, and can be readily interfaced with an Alesis ADAT (providing you have a MIDI interface for your ADATs), there's really no contest at the price.

SOS

E D90 £1499; 8338 SCSI option £199. Prices include VAT.

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Bassline Rally

Novation are championing affordable analogue synthesis again, this time with even more bells and whistles. CHRISTOPHER HOLDER fills up with Super.

NOVATION SUPER BASS STATION

Okay, let's go over this one more time for those at the back of the class. The year was 1983 and Roland's TB303 Bassline was released onto the market, with little fanfare, as a bass-playing sequencer and companion to the TR606 Drumatrix drum machine, allegedly a complete auto-accompaniment system for instrumentalists. Instrumentalists stayed away from the silver box in droves — the 303 was hellish to program and approximated the sound of the bass guitar as effectively as a Pepperami Gobbler approximates a Christmas dinner. During the mid-'80s, rumour had it that 303s found new roles as adventure playgrounds for pet gerbils or handsome bird tables, and locating a brand new boxed 303 with manuals was as easy as sticking your head into your grandmother's loft. Second-hand prices plummeted, hitting rock bottom around the £20-50 mark, while units were often given away in garage-sale job lots with assorted gnome collections or Hornby railway kits.

Later in the decade, dazed party-goers returned home from Ibiza with tales of squelchy repetitive dance music. Predictably, 'acid' music soon hit the UK (much to the Home Office's consternation), and seminal choice cuts such as Acid Trax on DJAX

became hot property. It became common knowledge that the sound that was responsible for the organic, morphing, squelching bass lines was the Roland TB303, and equally it became apparent that to produce acid music all you needed was the Bassline, a TR808 or 909, ideally, a few fuzz pedals, and (shock!) no musical training. The resulting price escalation of these requisite components is well documented, far exceeding the realms of 'silly money' (check the SOS free ads for proof).

It slowly came to the attention of manufacturers that long-discontinued analogue synths were commanding serious prices, but they denied any intention of re-releasing '90s versions of analogue 'classics' (a decision that has, naturally, undergone a complete U-turn). Like gumboot sellers at Glastonbury, smaller opportunistic manufacturers exploited the niche, helping to slake the market's thirst for all things analogue. Novation were probably the pick of the bunch, releasing the BassStation, a dinky-looking two-oscillator, monophonic bass synth residing in the chassis of Novation's two-octave controller keyboard. There were other contenders, of course, but the BassStation shone with its two oscillators, two envelopes, LFO and flexible modulation section, providing passable 303 emulation but, more importantly, a whole lot more. The BassStation rack soon followed, with all the facilities of its predecessor but heaps more memory, CV/gate outputs, an external input to the filter and envelope section, and a more business-like feel and appearance.

Now, a full two years on, Novation are introducing the Super Bass Station. Novation bring far more to the table than some minor alterations to the aesthetics and spec; instead the scope for sound creation and manipulation has undergone a quantum leap. So let's run through a few of the new additions: an arpeggiator, a noise source, ring modulator, two LFOs instead of one, a sub-oscillator, analogue chorus and distortion effects, panning, larger memory capacity, clock output, and even more pots and switches in the process. Phew... where to begin?

HALLELUJAH CHORUS

The Super Bass Station's newly-acquired analogue effects are a welcome inclusion. The Chorus effects owe much of their character to the Roland Juno 6 and Juno 106, and can vary from the gentle to the extreme. Interestingly, you can use LFO1 or 2 to dictate the waveform and speed of the chorus modulation and, even better, if you have the LFO locked to MIDI clock, the chorus can be modulating in time to the sequencer.

One of the first things anyone with a TB303 does is plumb its wibbles into a distortion pedal or distort the acid line on the desk. So it seems a judicious move on Novation's part to include a gritty analogue effect on board. The distortion bears little resemblance to its digital cousins on your multi-effects unit; instead it adds a certain crunchiness to most programs. If you do want

something more extreme, I can recommend cranking up all the oscillators, bumping up the white noise and ring modulator levels and re-routing an output back into the unit's external input. About as subtle as a hand grenade.

If you're after even more movement and variation in your sound, the stereo panning effect should deliver. You can have either LFO or Envelope 2 modulating the panner to an adjustable depth.

By way of example, you might have your arpeggiator pattern rattling along on 16th notes sync'd to MIDI clock, with the notes meanwhile undergoing a chorus modulation effect locked to LFO1 coming in and out on every eighth note; finally, you could have a random waveform LFO2 modulating the panner, scattering the notes over the stereophonic field in any way it sees fit — all synchronised to the bpm of the song.

LET'S GET PHYSICAL

Physically, the Super Bass Station shares some characteristics with the BassStation rack. For starters, it's housed in a 1U rack, and the keypad and numeric display share the left end of the unit with the headphone socket, and volume and portamento pots. The rest of the user interface is organised in a similar fashion to the previous BassStation's, with some minor alterations to the architecture to accommodate the extra facilities. The LFO section includes a LFO Select switch; the Oscillator 1 & 2 and modulation sections have been combined where waveform, pitch, tuning, and modulation parameters are dealt with; the mixer section has been expanded to accommodate the sub-oscillator, a white noise source, the external input and a ring modulator; the filter section stays familiar with the addition of





UPS AND DOWNS OF PROGRAMMING

The arpeggiator section is possibly the single most outstanding new addition to the Bass Station: it's well conceived and interesting results are quite easily achieved. The Arpeggiator utility runs you through the options step by step. The first page in the utility switches the arpeggiator on and sets the speed. Next you're given a choice of octave range, dictating how many octaves the Bass Station will sweep through while arpeggiating. Other facilities determine whether the arpeggiator runs only while notes are being held on the controller keyboard or whether it 'remembers' the notes played and continues arpeggiating ('latching'); a keysync function dictates whether new notes can be added to your arpeggio or whether it's reset every time a

new note is played. More interesting are the pre-programmed patterns. Apart from the usual up, down, and 'round 'n' round options, Novation have supplied 100 arpeggio patterns. Some are designed for TB303-style autoglide patterns, others are more ponderous rave riff patterns, while others still give you an instant ticket to New Romantic cheese. I'm in favour of any feature that gets your creative juices flowing, and these patterns certainly do it for me. Patterns can be sync'd to MIDI clock signals from your sequencer or internally sync'd to either of the LFOs — so playing along from your master keyboard is pretty simple. Also the Arpeggiator Latch may be switched off and on using sustain MIDI information — if

you have a sustain pedal this would be particularly useful for playing live.

Novation have chosen to have the arpeggiator parameters stored as Program Information rather than as a global section. On balance, I wonder whether this was the right way to go about it. Perhaps having the Bass Station responding to the arpeggiator globally would allow you to find the right pattern and then allow you to scroll through the Programs to arrive at the right sound. To then have arpeggiator pattern numbers respond to controller information would be the icing on the cake. Actually, the glacé cherry on the icing of the cake would be a physical arpeggiator switch on the front panel to turn on the arpeggiator and all your carefully selected parameters without descending into the utilities pages.

keyboard tracking and LFO2 depth; and, finally, the envelope section is filled out to give the second filter envelope its own dedicated ADSR controls.

Around the back you'll find MIDI In, Out and Thru, jacks for CV and gate outputs, and an external input jack. What's new is stereo outputs rather than mono, and a clock output. The stereo outputs are required to give the stereo chorus options full effect, not to mention the panning. The Clock Out jack is a natty provision: this output sends an analogue trigger signal synchronised to either of the LFOs or the arpeggiator (all of which may, in turn, be synchronised to MIDI clock signals produced by your sequencer). The arpeggiator of pre-MIDI analogue synths such as the Korg MonoPoly, Sequential's Pro One, and the Roland SH101 will respond to the click, and play along in time.

MORE IS MORE

That's looking at the outside, but a look at the internal additions tells us where the action is. Firstly, the actual sound sources have been expanded, notably by the addition of a sub-oscillator. The sub-oscillator has its own level pot; it produces a square wave one octave below oscillator 1, and is modulated along with oscillator 1. The sub-oscillator

can't be sonically manipulated to the same degree as the other two, but acts as a third voice to fatten up the sound — great for stonking lead lines, as well as beefing up your acid. The noise source joins the signal chain in the mixer section and is great for adding a harsher texture to your sound; on its lonesome you can use it to spend hours making perfect Vangelis swooping wind noises (no, I'm not referring to his digestion), or waste hours of your life making analogue percussion noises (after a few minutes I was producing classic Richie Hawtin/Plastikman phasey, plucking sounds... oh joy). The ring modulator is also new, and a welcome inclusion; it's an effect rarely seen since the grand ol' days of the monster modular synths. If it's the clangorous you're after, then the ring modulator delivers. I won't go into an explanation of the electronics behind ring modulation, particularly considering Paul Wiffen has gone to the trouble of doing it already, on page 92, but it is a very useful synthesis tool indeed.

MIDI IMPLEMENTATION

As far as I can tell, every pot on the Super Bass Station recognises and transmits MIDI controller messages, including the ADSR controls of both envelopes, all level information in the mixer section, tuning information, LFO details, and the analogue effect control in Utility mode. Furthermore, the Super Bass Station responds to aftertouch and breath-controller information. Having such comprehensive MIDI control is really valuable: just send the sequencer running and tweak to your heart's content, safe in the knowledge that anything outstanding can be reproduced (provided your hardware and software package is up to the task).



Novation Super Bass Station

► The resulting factory presets, or Programs, are naturally more varied and more interesting than anything Novation have previously achieved. Of the 200 Programs, 50 are in ROM (and cannot be overwritten), while the rest may be adjusted, fiddled and saved as you desire. The preset selection is good quality and the number of user programs generous. Novation use all their new bells and whistles to full effect, with many programs panning, chorusing, or distorted. Fat lead sounds are well represented, and white noise and ring modulation effects are present, as is the just plain weird stuff.

HERITAGE LISTING

I have to admit to being a fan of the Novation sound, so it doesn't surprise me that I immediately took to the Super Bass Station. When the original BassStation landed on my doorstep (after I'd 'borrowed' my girlfriend's credit card to make the acquisition), it arrived with a four-page pamphlet that Novation

pros & cons

NOVATION SUPER BASS STATION £449

pros

- Huge range and variety of analogue sounds.
- Comprehensive arpeggiator section.
- Ring modulator.
- Flexible MIDI sync options.
- CV/gate output.

cons

- No on/off switch.
- No centre detents on appropriate pots.
- Arpeggiator parameters saved with Program.

summary

More knobs, dials, buttons, switches, oscillators, effects and sounds for not much more money. An instant upgrade choice for aficionados of the Novation sound, user interface, and reliability; and a compelling alternative for anyone looking to purchase an analogue (or analogue-sounding) synth, with enough features to produce something out of the norm.

SOUND ON SOUND

imaginatively called the manual, it only had seven memory locations, and it functioned on six AA batteries — but, disregarding its limitations and dinkiness, the BassStation was impossible to dislike. The latest Bass Station incarnation has undoubtedly honed, distilled and expanded on the strengths of its heritage.

For a start, the manual is a weighty and comprehensive piece of contemporary literature, taking the novice through the basics of subtractive analogue synthesis as well as running through all the features of the Bass Station in a clear and concise fashion. As

GETTING IT RON

I don't know whether it was intentional or merely an unfortunate spell-check glitch, but occasional references to Roland in the manual have appeared as Ronald. Nice touch.

Novation have added more and more facilities, it is natural that their user interface will come under closer scrutiny. Alterations have been made to accommodate the added LFO, oscillator and sound sources, and the result is a straightforward approach to synthesis. The Super Bass Station has enough going on in Utility mode that it would benefit from a LCD rather than the two-digit screen, but getting around the keypad is far from painful. Elsewhere, centre detents on the relevant pots would be useful, as would a DIN sync output to trigger the likes of a Roland TB303 or MC202 (considering that a clock output jack is supplied, why not?)

Now that the Bass Station's newest guise is given analogue effects, white noise, a ring modulator, expanded LFO and oscillator facilities, and an arpeggiator, among other things, it begins to leave the realms of the humble 'acid machine' and make a niche for itself. If you were planning to purchase a synth such as the Korg Prophecy or Clavia Nord Lead on the strength of its analogue emulations, you should be looking at the Super Bass Station before you go ahead and do so. Likewise, if you're looking for a cheaper analogue sound source, you owe it to yourself to investigate the Super Bass Station anyway — you may decide that you can't do without the other features.

As far as the price is concerned, all the covetable extras would seem to make the Super Bass Station well worth the £449 asking price. The unit's capacity for producing something unusual, even unique, has been greatly increased, and it will be a great tool in the hands of a skilled programmer. But — at the risk of stating the bleeding obvious — in a judgement of its financial value, it also has to be noted that the Super Bass Station is only capable of playing one note and one program at any one time (although there are rather more expensive monophonic synths on the market). If you do decide on the Super Bass Station, though, I'm sure you'll agree that it looks good, feels right, sounds great and is brilliant fun to work with.

SOS

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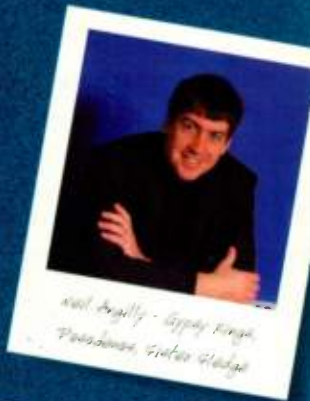
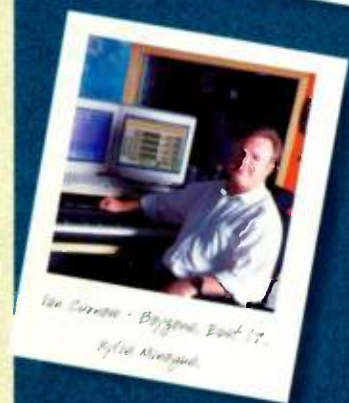
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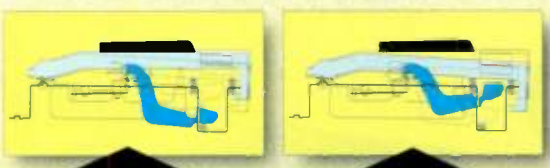
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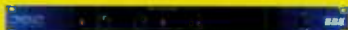
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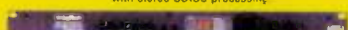
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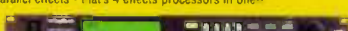


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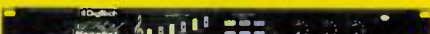
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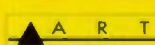


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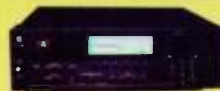
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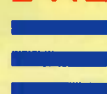
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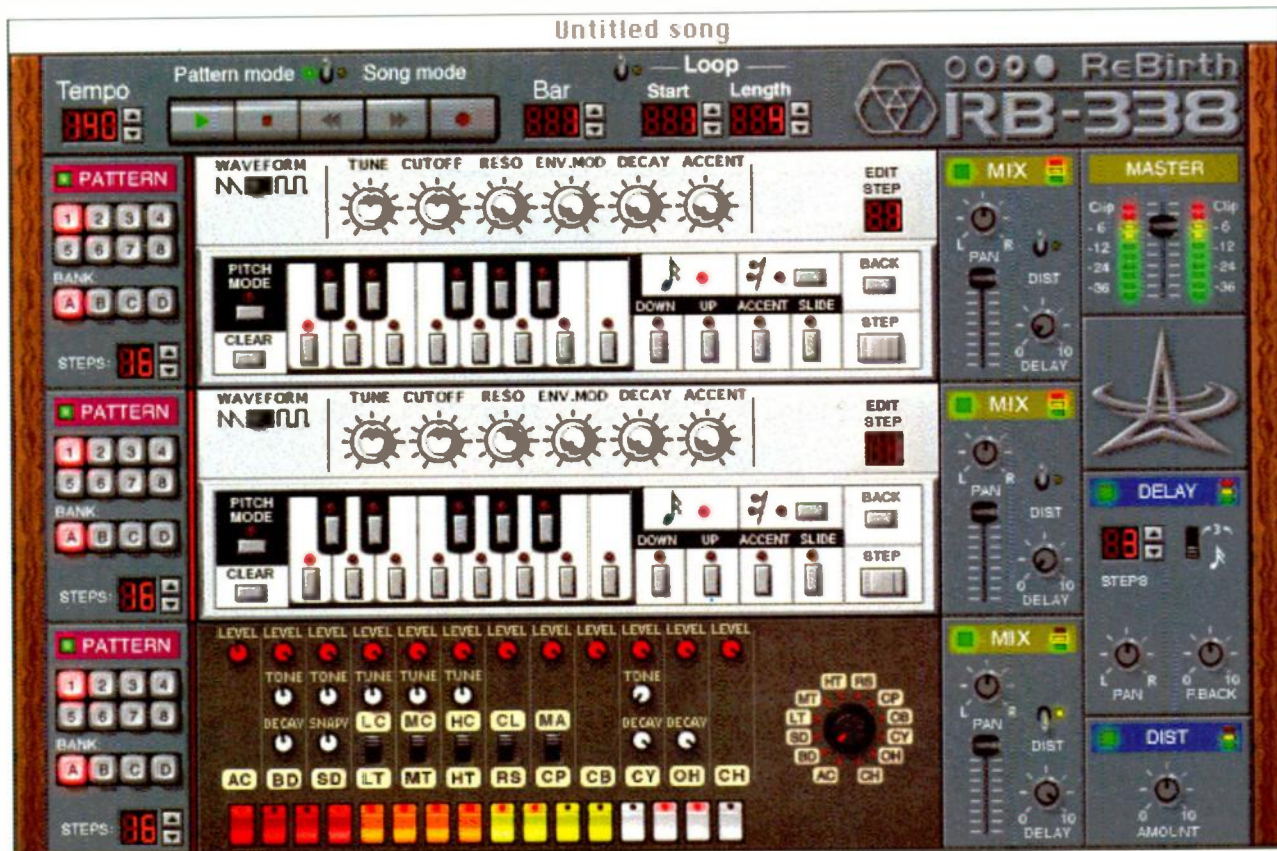
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Born wibbly

STEINBERG/PROPELLERHEAD REBIRTH RB338 TECHNO MICRO COMPOSER SOFTWARE FOR MAC & PC

If you've been desperately seeking a TB303 at any price, this inexpensive software, which provides the equivalent of two of the little silver dream machines, plus a virtual TR808, could be the answer to your prayers.

DEREK JOHNSON & CHRIS CARTER find out whether it's too good to be true...

In the years since the start of the analogue synth revival, we've been presented with a growing pile of newly-built emulations of antique instruments. The high prices of the 'real thing' mean that small companies producing costly analogue technology can make a profit while actually saving the musician cash. A prime target for replication has been Roland's classic TB303 Bassline synth/sequencer combo, but the new machines, for all their good intentions, sometimes miss the point of the original by adding extra features and losing the sequencer, while also failing to exactly replicate the Bassline sound.

So a group of enterprising Swedes decided that the DSP and processing power of the latest generation of Power PC-equipped Macs and Pentium-toting PC clones (with compatible soundcard) could provide a launchpad for a different approach: a 16-bit, 44.1kHz software replication of a TB303. Propellerhead, the company in question, actually went further, and the resulting package, *ReBirth RB338*, provides no less than two virtual TB303s and a virtual TR808 drum machine, with pattern-based sequencing plus distortion and basic delay effects. Could this be the ultimate techno software package?

BORN AGAIN

ReBirth has been mentioned in *SOS* in the past, notably in our two-part software synthesis feature (April and May 1997). At the time, *ReBirth* was at an early beta stage, awaiting commercial release. Since then, Steinberg have become involved, helping to bring the full package to an eager public. This is not as strange a move as you might think: Propellerhead are also behind *ReCycle*, Steinberg's sophisticated sample manipulation tool.

Both PowerMac and PC versions of *ReBirth* come on a single CD-ROM. Installation is painless (but follow all tips regarding buffer size), and the disc is used as a 'key': it must be inserted in your CD-ROM drive whenever you launch *ReBirth*. On the manual front, there's a thin, 'getting started' booklet that covers installation and simple operational guidelines, but the in-depth manual comes in the form of a PDF document, for use with the supplied Adobe *Acrobat Reader*. Now, this makes good ecological sense, but on-screen manuals are not my cup of tea, especially when you can't manipulate the text to fit it onto fewer bits of paper for more convenient off-line referral.

Launch *ReBirth*, and what you see is what you

get. If you can't figure out how to make it go within a few minutes, you're in the wrong business — it's that simple. The *ReBirth* screen is dominated by graphic representations of two TB303s and the TR808, with a strip across the top offering transport controls, tempo display and control, song position display and Loop display. You won't have found distortion or delay effects on the originals (as you can on the software equivalents), but they add extra interest to the software; if you want to be purist, you don't have to use them.

Each instrument is referred to as a 'Section', and contains, in addition to the main instrument, a Pattern select box, offering four banks of eight Patterns each, a Pattern length selector (up to 16 steps), a level fader, pan pot, mute switch, level meter, distortion switch (only one Section at a time can access the distortion effect) and a delay send knob. All that remains is the master level fader and bargraph meters.

TB OR NOT TB?

Graphically, the TB303 Sections seem remarkably familiar. Almost all the controls present on a real TB303, bar Track and Pattern mode knobs and the Tie button, are included, if in a slightly mutated form — one set of transport controls, for example, governs the whole program. Even the LEDs have on-screen equivalents. The sound control set is identical to the original, featuring a selector switch for square and sawtooth waveforms, and knobs for tuning (one octave up or down in semitones), filter cutoff frequency, filter resonance, envelope modulation, decay and accent.

Note input is accomplished with the one-octave mini keyboard. There are two note entry modes: Pitch mode automatically moves along step by step as you assign a note, with octave up/down, Slide, Accent and Rest options, to each step; with the other option, you manually move from step to step, using, not surprisingly, the Step and Back buttons. Though, as mentioned above, there's no Tie button, which is used on the real TB303 to create notes that hold for longer than a single step; assigning Slide to two or more notes with the same pitch value achieves the same result.

If you don't like using a mouse all the time, to move the on-screen controls, *ReBirth* gives you the option of programming the TB303s from the computer keyboard. This takes a bit of getting used to, but may well be the speed-programming method of choice for most users.

808 STATE

While retaining an authentic look, the virtual TR808 is rather more stripped down than the 303s, though the essentials are there: the 16 step buttons at the bottom of the display, the drum sound select knob, plus the controls for each drum voice. There are 15 drum voices altogether (plus an Accent option, which will affect all voices assigned to its Pattern step). However, as with the original 808, some voices feature a choice of two sounds, and a switch selects which sound is used. Each drum voice has a level control, and where the original 808 offered Tone, Decay or 'Snappy' controls (the latter belongs to the snare drum!), they are also included here. All drum sounds can play together on one step, apart from the open and closed hi-hats. Here, the closed hat has precedence.

To create a rhythm Pattern, select a drum voice using the voice select knob (or by clicking on the voice legend that runs underneath the controls), and click on the step buttons for the steps where you'd like that drum to sound. This can be done with the sequencer running or not, and you can even run your mouse pointer across the step buttons to quickly activate them all, just like using your finger on the original.

CHAIN GANG

Just as the original TB303 and TR808 did, *ReBirth* offers the user both a Pattern and a Song mode. While the software's interface may be different, the goal is the same: creating a finished song by chaining the 32 Patterns in each of *ReBirth*'s three sections. Think of *ReBirth* as a 3-track pattern-based sequencer with sounds, where each sound has its own set of Patterns, and you shouldn't go far wrong. To get going, select a Section, choose a Pattern, either with your mouse or from the computer keyboard (note that Banks can't be selected with the latter option),

pros & cons

STEINBERG REBIRTH RB338 £149

pros

- Authentic emulation of two (or is that three?) analogue classics.
- Easy to use, and apparently bug-free.
- Great value, if you already have a suitable computer.
- Loops can be saved as samples for transfer to audio sequencers or samplers.
- A graphic *tour de force!*

cons

- No multiple audio output capability.
- Syncs as slave only; can't operate as a master.
- Mouse interface is occasionally frustrating.
- No MIDI control of knobs.

summary

While not operationally a complete replication of the vintage hardware it's designed to emulate, the feel and sound of *ReBirth* is unmistakably vintage. The on-screen knobs and pattern-based operation make for an easy-to-use, immediate and fun environment — though knob-tweaking with a mouse will never be as enjoyable and intuitive as the real thing. Thoroughly recommended.

SOUND ON SOUND

HEAD-TO-HEAD: REBIRTH VS ROLAND

Long-time TB303 and TR808 user Chris Carter wrote our TR808 retro review in May's *SOS*. We asked him to check out *ReBirth* (running on his PowerMac 7600) side by side with the real things; here are his conclusions...

I started by setting up some basic, but identical, 16-step patterns on the TR808 and the 808 Section of *ReBirth* and running them side by side. Initially, the most obvious difference is in the instrument tunings, with some quite noticeable deviations. The snare, toms, congas, claps, cymbal and open hi-hat are all pitched about a tone higher, while the claves and cowbell are pitched lower than the original, with the cymbal and cowbell deviating the most. Other differences are less pronounced, such as the *ReBirth* bass drum having less buzz and body, and a slightly shorter decay. The claps, cymbal and hi-hats all

sound a little less full than the original, but the classic 808 snare, if anything, sounds better on *ReBirth*, distinctly brighter and 'snappier'. With a rhythm in full swing, switching between the TR808 and *ReBirth* revealed a definite 'lift' in the overall sound when listening to *ReBirth*, probably due in part to the higher tunings, and also the slightly brighter sound some of the instruments have. On the whole, though, it's a pretty convincing and successful emulation of the 808 sound.

Comparing the TB303 Bassline is possibly a slightly more subjective task. Playing various identical sequences on the real TB303 and *ReBirth*'s simulation, it was pretty easy to create similar filter, envelope and accent settings, and to most ears *ReBirth* will sound almost identical. To 'experienced' ears, the main difference

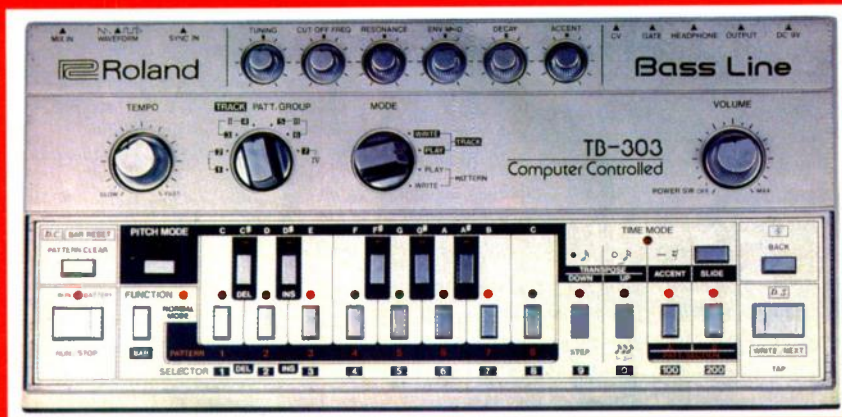
(and this isn't a criticism) is the partially extended upper and lower filter range. Also, the *ReBirth* 303 has a slightly brighter sound, which could be attributed to the extended filter range, but at the upper limit it definitely has a slight digital edge, compared to the original. The accent control doesn't quite have the range or extra punch of the original TB303, but this is just nitpicking. Overall, the sound is just about as close to the original as you can get — and setting the controls to the same position on both hardware and software TBs results in the same sound. Very impressive indeed.

Programming *ReBirth* is a piece of cake compared to a real TB303. Any 303 owner will know that this can be a very frustrating experience, often involving large doses of guesswork and luck. However, with the TR808 I wasn't so convinced, and found programming the original to be a little easier — I

also missed the printed numbers above the 16-step buttons, a freely rotating instrument selector, an A/B pattern switch and the I/F variation switch. Some of the level controls seemed a little quiet compared to others.

Bearing in mind that most people won't be comparing the two like this, I think *ReBirth* emulates the original TR808 and TB303 sound very successfully and improves on the programming of the original 303 immensely. Of course, you don't get the individual outputs that are so useful on the TR808, but if Steinberg came up with a way of interfacing *ReBirth* with something like Korg's 1212 I/O or Emagic's Audiowerk8 PCI cards, that would be a pretty powerful combination. Funnily enough, after a couple of days, I began to favour the *ReBirth* 303 over the Roland — sacrilege, I know, but having two to play with, with MIDI sync to boot, is impossible to resist. *Chris Carter*

STEINBERG/PROPELLERHEAD REBIRTH RB338



Spot the difference: the original Roland TB303 (above) and Rebirth's virtual control panel (below).



and the editing and control possibilities are pretty comprehensive. You can record Pattern changes and controller movements on the fly, or record Patterns separately (again, on the fly or in step time), adding the controller movements separately. Controller movements you're not happy with can easily be changed, simply by going into Record again, and tweaking the offending control or controls. Nothing is recorded until you touch a given control, and all other movements remain unscathed. When you're done, simply press Stop. Using Loop mode allows you to focus on a few bars at a time in order to get your tweaks absolutely right.

There may be occasions where you'd like a control or controls to have the same position for a whole Song (or Loop) — an example might be the level and pan settings for each section. Simply go into Record, move the control to your desired position, and select the Copy Touched Controls option from the Edit menu. This feature saves you the hassle of having to record a control's movement for the whole Song. Cut, copy and paste functions are also available in Song mode. Something to keep in mind is that if you change a Pattern used by a Song, any sections of a Song that use that Pattern will also change.

One strange thing is that when you have more than one Song open, there's no way to switch between them on the menu bar — you have to drag the Songs around the desktop and click on them; luckily, though, when you bring another Song forward the original doesn't stop playing until you tell the new one to start.

Naturally, you can save as many *ReBirth* Songs as you have hard disk space, which is a great improvement over the original TB303 and TR808, which lacked any way to save their memory externally.

REBIRTH & THE WORLD

Communication between *ReBirth* and the outside world is certainly possible. On a simple level, *ReBirth* can be synchronised to other applications running on your computer, via OMS on a PowerMac or a (supplied) utility called *Hubi's Loopback Device* on a PC, or to external devices over MIDI. The software is always a slave, never the master, though. It is also possible to run *ReBirth* alongside *Cubase VST* and mix the audio tracks via the PowerMac's audio hardware, using Sound Manager. If you have a PCI audio card, *VST* could be routed to that, while *ReBirth* would use the PowerMac's native hardware.

I wasn't able to test the options on a PC, but the manual is quite clear in explaining the techniques. It may be, though, that PC users will need to add a few system enhancements. Running *ReBirth* synchronised to *Cubase*, without audio, should be fine: simply launch *ReBirth* first to ensure that it has access to the audio on your PC. If you have two audio cards, *Cubase Audio* can use one and *ReBirth* the other. If you've only got a single audio card, you're probably stuck, since *Cubase* currently takes precedence over any other audio demands on your soundcard. The manual notes some exceptions, however, and states that

DRUM SOUNDS

Here's a list of the virtual TR808's drum sounds, and their abbreviations. As mentioned in the main body of the review, some voices feature a choice of two sounds; these 'shared' sounds are separated by a slash.

- Accent (AC)
- Bass Drum (BD)
- Snare Drum (SD)
- Low Tom (LT)/Low Conga (LC)
- Middle Tom (MT)/Middle Conga (MC)
- High Tom (HT)/High Conga (HC)
- Rim Shot (RS)/Claves (CL)
- Claps (CP)/Maracas (MA)
- Cowbell (CB)
- Cymbal (CY)
- Open Hi-hat (OH)
- Closed Hi-hat (CH)

SYSTEM REQUIREMENTS

- **APPLE:** Power Macintosh with 16Mb RAM, 16-bit audio, Apple Sound Manager 3.2 and System 7.5.3 or later.
- **PC:** PC clone with a Pentium processor, 16Mb RAM, Windows 95/NT 4.0 and a 16-bit soundcard.

▶ and start inputting notes or drum beats. As you may have gathered, a Pattern can be any length you like, up to 16 steps; it's worth mentioning that Patterns with different lengths can play side by side, so if you fancy a 16-step drum pattern running alongside 11- and 7-step Patterns in the TB303 Sections, go for it. Strangely, creating Patterns in Pattern mode doesn't actually involve pressing the Record button at all: simply press Play, and notes or drum hits are added as you play them.

While knob-tweaks can't be recorded in Pattern mode (though they can be played in real time), there are several other editing functions available in this mode. For example, you can cut or copy Patterns and paste them to other Pattern locations, either in the current or a different Song, and Patterns can be shifted, one step at a time, forward or back. If you're editing a drum Pattern, individual drum voices can also be shifted. One octave of transposition, up or down, is also available to the TB303 Sections. In addition, there is a range of options for randomising and altering your patterns. The options for the TB303 Sections are to randomise the whole pattern; pitch or accent; slide; rest; and octave. In the drum Section you can choose to randomise a whole Pattern or an individual drum voice. Randomise is pretty unpredictable, but using a related option, Alter, can add a bit of unexpected variety to material you've already prepared. Be warned that Alter and Randomise functions can not be undone, so copy or save your work if you might want it back again.

A finished Song is created in Song mode, where you chain Patterns together and record knob movements. A Song can be up to 500 bars long,

WOT, NO 909?

After having read this review, it may have occurred to you that the most trendy drum machine at the moment is the TR909, the TR808 having reached its peak a few years ago. So why isn't the TR909 part of *ReBirth*? A look at the FAQs on Propellerhead's web site

(<http://www.propellerhead.se>) reveals the company's reasoning: the TB303 emulation was the reason for *ReBirth*'s existence, with the drum machine being sort of a bonus. They picked the 808 because it's 100% analogue, "which is totally in line with the whole idea of *ReBirth*" The TR909, remember, actually contains samples.

some advanced audio cards, such as the Terratec EWS64, can fool the PC into thinking that there's more than one card installed. If you have such a card, follow the instructions for use of two cards, above.

If your computer is under-powered, or there are other problems with running several audio applications on it, there's an easy answer: save your *ReBirth* song as an AIFF or WAV digital audio file, using Export Loop. The resulting stereo file (complete with delays and distortion) could then be loaded into a track of your MIDI + Audio sequencer or beamed over to a sampler. If you need to make any changes to *ReBirth*'s contribution to the track, make them in *ReBirth* and re-export the loop. Expect sample CDs to include the fruits of *this* function soon.

KNOBBING AROUND

If only all software were like this: graphically attractive, simple to use, and crash-free. Operationally, the only problems with *ReBirth* arise from using software to emulate hardware: in the real world, you can tweak two knobs at once and quickly move from knob to knob. On screen, it's always going to be one knob at a time, with that most unmusical of interfaces, the mouse. It can also be fiddly to program the TB303 sequencer with a mouse, but at least this can be done quite acceptably with the computer's keyboard. It would be very nice if the knobs were addressable via MIDI controllers — they're not — so that a device such as Peavey's PC 1600 could be used to program knob tweaks. There's also no way to program the *ReBirth* TR808 other than on screen.

Some dedicated analogue freaks will wonder at the lack of individual outs for the drum section, assignable, perhaps, to the separate outputs of a PCI card; one compromise would have been to provide a pan control for each drum voice. As it stands, apart from a pan pot for each Section and the delay, everything in *ReBirth* is in mono.

The most important aspect of any analogue emulation, though, is the sound, and to these ears, *ReBirth* is one of the most convincing copies available. Unfortunately, I haven't been in possession of either a TB303 or TR808 for some time. Chris Carter is not quite so deprived, however, and was able to test the software side by side with the real thing — see Chris' box for his conclusions on this matter.

REBIRTH OF THE COOL?

Operationally and sonically, *ReBirth* can hardly be faulted. A perverse thought occurs to me: if you haven't got a computer, or a TB303/TR808 duo, you might actually come out ahead by buying a new computer and *ReBirth*, rather than paying the inflated prices demanded for 15- or 20-year old hardware. And if you already own a PowerMac or a compatible PC clone, you'd be way ahead. If you have any kind of interest in dance music or the sounds produced by Roland's antique twosome, go out and get a demo of *ReBirth*. Now. You will not be disappointed.

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JAMES • RECORDING *WHIPLASH*



► by Brian Eno, which was a million miles away from *Seven*. *Laid* reaped much critical acclaim, and they had their biggest ever US hit with the title song. Having cracked America, James followed *Laid* with an uncommercial, eccentric, experimental album of out-takes from the *Laid* sessions. *Wah Wah* (1994) veered around somewhere between ambient, industrial and dance music, and divided fans and critics alike. And now, three years after their last

album, there's *Whiplash*, and again the band have made a musical left turn. *Whiplash* is awash with full-throttle, distorted electric guitars, heavy rhythms and electronic eeriness, all held together by pop producer Stephen Hague (Pet Shop Boys, Jimmy Somerville), with Tim Booth wailing over the top in a stereotypical mid-'80s indie vocal style. If 'Greenpeace' is preachy and sentimental, and 'Go To The Bank' and 'Play Dead' full of industrial clutter, the anthemic 'Tomorrow', the elegant 'Lost A Friend', the slide-guitar driven melodic rock of 'She's A Star', the lilting 'Waltzing Along'

and the atmospheric 'Blue Pastures' are the best tracks, and arguably the best work, that James have ever done.

There are some echoes of *Wah Wah* on *Whiplash* — in the industrial and dance music influences, and in the track 'Tomorrow', which is a revamped version of the final track on *Wah Wah* — but overall *Whiplash* sounds as if it was made by a different band from the one that made *Laid*. Jim Glennie agrees, saying: "We always tend to react to the album before. *Laid* was a reaction to *Seven*, *Whiplash* a reaction to *Laid*," suggesting that the change of direction on *Whiplash* was purely the result of that reactive process. But other factors contributed to *Whiplash*, most of them part of the fall-out from Black Thursday. Although James' music had always come into being through collective band improvisations ("It never happens that someone brings in a finished song," says Baynton-Power), until that day singer Tim Booth had held tight control of the music, involving himself in every single musical decision. Now the band was in ruins, both financially and emotionally, and Booth was about to go off to make his duo album with Angelo Badalamenti. Clearly they would have to either disband, or find other ways of working.

FAREWELL TO DEMOCRACY

When the band found themselves in disarray after Black Thursday, it was drummer David Baynton-Power, a member of the band since 1989, who unexpectedly took the lead. He remembers, laughing: "Well, none of us are much good at doing anything else except make music, and we also felt that we were good for another album, so we thought 'Let's just do it'. I suggested ideas for how we could work cheaply on a new album, such as recording stuff with rented equipment in band-members' homes." ►



David Baynton-Power at Foel Studios.



"Democracy is a wonderful process, but you do have to be careful that you don't end up with a musical compromise that's a dilution of what could have been."



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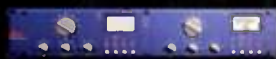
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JAMES • RECORDING *WHIPLASH*

► idea to go into a studio with a producer and finish the album off. At that point we went to see Brian Eno, but he realised that we knew what we were doing, and that we didn't need him to stop us messing things up. He said that he didn't want to babysit us through the album, and that he would only come in occasionally, to make sure things were still on track."

Stephen Hague was appointed as main producer instead, and Brian Eno made his way about once a week to RAK and Real World, ending up with credits for "frequent interference and co-production" as well as "keyboards and backing vocals". The whole band actually felt confident that Dave Baynton-Power could have seen the album through on his own, Glennie explains, but their record company was keen to give the overall responsibility to a big-name producer, and insisted on Hague's involvement.

"They want the security of being able to go: 'Yeah, brilliant, Eno's involved, Hague's involved, nothing can go wrong'," Baynton-Power agrees. "And it is really good to have an outside opinion, someone who can be objective and tell you what's good and bad. Often we're way too self-critical and think something is bollocks, and Eno was very good at saying 'Stop there, that was great'. And we'd think 'It can't be that easy, you have to struggle.'"

"The best example is the song 'Laid'," says Glennie, "the single that broke us in the USA. It's screechy, scratchy, badly recorded, the timing is all over the place — it was thrown together really haphazardly, just one of the silly run-throughs in the very early life of the song. And Eno said 'That's great, leave it'. And we were saying 'Are you sure? It's all over the place'. But he insisted it was fine. So then you ship it off to the record company, and they listen to it and, because Eno has done it, they say 'A work of genius, so scrappy, isn't that brave?' But if Dave had done it, they would have said: 'It sounds shite, it sounds like a demo'. It's how all record companies think, and it can be frustrating."

It could be argued that, while James talk with some bemusement and maybe even a hint of awe about the working methods of Brian Eno ("When you think you're just jamming, but someone like Eno tells you it's brilliant, you think that maybe he has a point"), they do actually still need a producer who can do what Eno does. But then, *Laid* is almost as uneven an affair as *Whiplash*, with some beautiful songs, gorgeously played, sung and recorded — 'Dream Thrum', 'One Of The Three', 'Say Something', 'Five-O' — but some, 'Out To Get You' and 'Knuckle Too Far', that sound just like haphazard rehearsals. In any event, according to Glennie, Eno's instant, intuitive way of working and Hague's contrasting perfectionist approach did complement each other:



David Baynton-Power with the group's new Soundscape system.

"We weren't too sure about how Hague would react to Eno coming in now and again and sticking a spanner in the works. But they actually worked together incredibly well. Sometimes one would suggest one thing and the other would suggest something else, and it was quite an amazing experience for us to have these two top producers suggesting things to us. It was an impressive line-up!" laughs Glennie. "And then there was Dave holding the reins in the other room, throwing ideas around. Tapes were being sent to and fro between the two studios, and even occasionally to a third studio, where Tim would explore lyrical and vocal ideas. And out of this three-studio situation came several brand new songs, such as 'She's A Star', 'Lost A Friend', 'Greenpeace' and 'Go To The Bank'."

NEW TOYS

James are often compared to U2 — for their cause-carrying rock, for their musical changes, for the way they write through band improvisations — and the process by which James created *Whiplash* sounds remarkably similar to the way U2 recorded their recent *Pop* album (see *SOS*, July 1997). David Baynton-Power explains that it's the inexpensiveness and flexibility of new gear that's given James a new lease of life: the DA88 recorders and the *Cubase* plus Emu 6400 MIDI setup at his home gave the band the chance to record cheaply at home without sonic compromise. The DA88 material and *Cubase* sequences were transferred directly to two Sony 3324 24-track digital recorders at RAK and Real World, where Stephen Hague used the two 3324 recorders to create new arrangements by shuttling between the two machines, and using slave reels for overdubs.

Technology also helps James to perform live, says Baynton-Power:

"A lot of people don't realise how much hardware we use live. But we don't show it off. We keep it hidden and so no-one notices. We work with drum machines and use a lot of pre-recorded stuff — we never use tape, it's mainly samples triggered manually by Mark [Hunter, James' keyboard player], or loops that we run off the old little Alesis sequencer, the MMT8. That's a brilliant piece of gear for live use, because it's stable, it never crashes, and it's user-friendly and quick to use. You can mute tracks with a touch of the button on the MMT8. Try doing that live with *Cubase* and a mouse!

"Live, Mark uses a Clavia Nord Lead, Korg Wavestation keyboard, Emu Orbit, Roland Super Jupiter rackmount and the Emu 6400 sampler, with 128K memory and hard drive. Brian Eno sang many of the backing vocals on *Laid* — he's brilliant



The core of James' new recording system; two Tascam DA88s, two Yamaha SPX90 effects units, and an Allen & Heath S2 mixer.

QUIK LOK

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at that, doing them very quickly with a Shure SM58 mic sitting behind the desk. To be able to perform these tracks live, we sampled many of Eno's backing vocals into the Emu and Mark plays them from a keyboard. And he often sends me a click track or a little drum beat from the MMT8, which only I will hear, via headphones, to make sure that all the backing vocals that he's firing from the sampler will be exactly in time with my drumming. Other than that, I don't use any MIDI live. I try to keep live drumming simple."

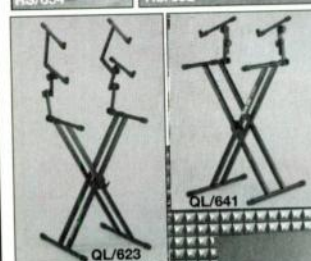
Finally, Baynton-Power reveals that James have taken so strongly to their new working methods that they've acquired a whole batch of recording gear which they're planning to take on their forthcoming tours, starting with the legendary open-air Lollapalooza tour in the USA (their first public appearance with Adrian Oxaal, who will take care of Larry Gott's guitar parts, including Gott's trademark slide-guitar work). The new setup consists of a Soundscape version 2 system, with a laptop PC and Emagic *Logic* software, two Tascam DA38 machines, and an Allen & Heath mixing desk, and they intend to use it to work on new material, together with the Roland MC303 Groovebox, Clavia Nord Lead, Emu Morpheus, a Korg A/D rack and a few reverbs and other effects.

"We're planning to write new material while touring," he says; "either in hotel rooms, or using the jams that we usually play during soundchecks. The Soundscape hooks up straight to the PC, and it's a really portable system that's eminently compatible with the DA38 recorders. We can load material recorded on the DA38 into the Soundscape and edit it digitally. Or we can configure the Soundscape into any kind of mixer that we want. We're planning to use Emagic *Logic* in the PC for MIDI sequencing and link it with Soundscape, and we're thinking about getting *Logic Audio* for the PC, which is supported by Soundscape, so you can use the Soundscape hardware to do the audio — rather than the PC, which will inevitably crash! That would make a great combination. We think it's a brilliant portable unit as it is. Working directly on audio material with Soundscape is a lot easier than sampling the section you want, naming and looping it and then triggering it from *Cubase*, which is what we previously did."

Anyone who has toured knows how draining it can be, because there's only an hour here or a couple of hours there to concentrate on something. It's incredibly difficult to be creative in such circumstances, and so hats off to James if they indeed manage to do significant writing while on tour. But then, bearing Jim Glennie's elegant summary of James' motto in mind, they may well go where few have managed to go before them:

"We always try to push things to extremes. We don't like to sit on our laurels and milk what we have done and never change. We're always looking to change our sound and looking for different ways of working. What us kept us going for a long, long time is the fact that we still manage to find ways of working together that keep our music fresh."

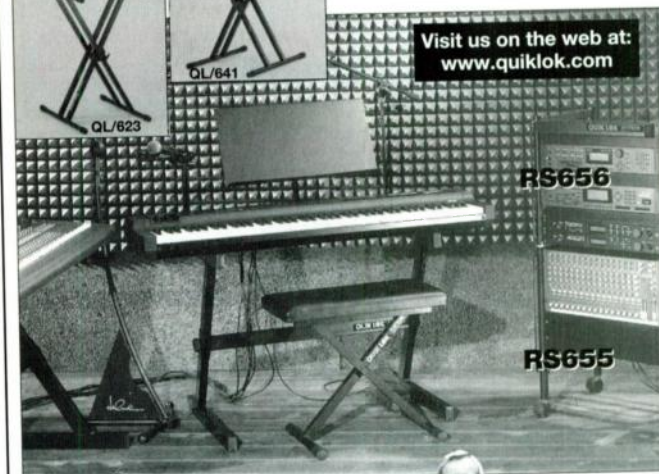
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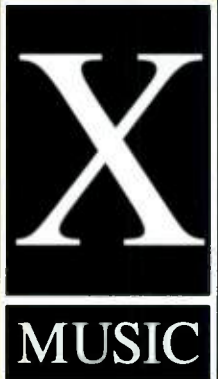
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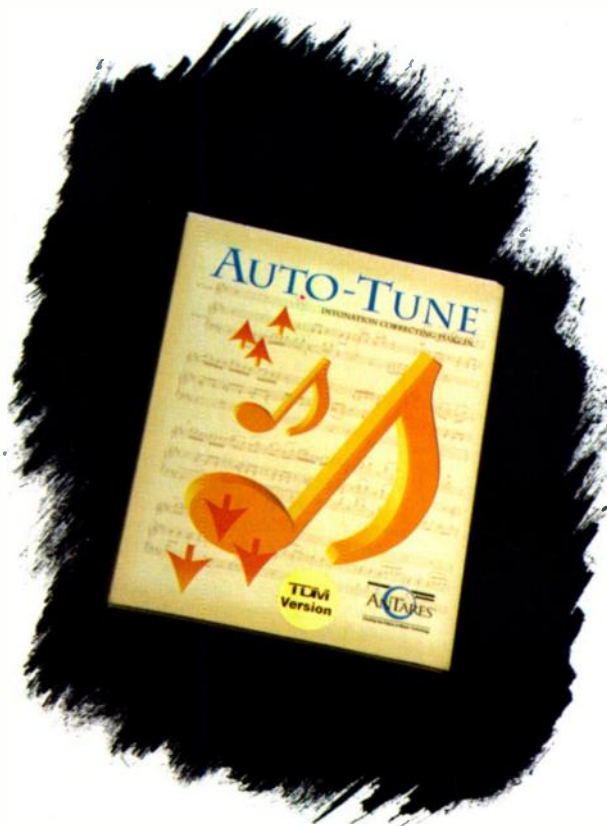
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What is four feet long, has eight legs, a long tail with a poisonous sting, razor like claws and doesn't like the smell of feet. (Never seen one but check your shoes!)



and also the rate of correction, so that natural scoops, swoops and vibrato can be retained if desired. What's more, if the singer has problems only with certain notes, individual notes can be bypassed on the target scale, so that pitch correction is applied only to specific notes. For more surgical precision on individual words or phrases, *Auto-Tune* has a graphical mode, where the pitch of the original performance can be viewed on a time/musical pitch grid. Various tools, similar to those found in basic computer drawing packages, are provided to enable the operator to create or modify the target graphical curve. The section can then be processed to conform to the new pitch graph. The most important thing to remember in Graphical mode is that the section of sound analysed must remain in the same position for processing. If you move it, *Auto-Tune* will carry out the correct operations, but in the wrong place. This is a 'feature' of the TDM plug-in system and not a fault of the program.

Auto-Tune's claim to fame is the extremely high quality of its pitch-shifting. The process is different to that used in regular pitch-shifters, and avoids all the unnatural warbling and glitching

INVISIBLE

ANTARES SYSTEMS AUTO-TUNE TDM PITCH CORRECTION PLUG-IN FOR DIGIDESIGN PRO TOOLS

MENDING

Every studio owner will be familiar with the problem of the young band who come in to record a track, but then find that while their singer is full of passion, the pitching is at best dubious, and certainly not up to professional standards. Perhaps you have the patience to cajole the singer into trying again with more emphasis on pitch accuracy, but then you find the fire has gone out of the performance. Even pros suffer from this problem to some extent; somebody who goes down a storm on stage may well be less impressive when they have no visuals and atmosphere to support them. What's needed is a magic potion that will help singers stay in tune, without losing their expression or energy. To my knowledge, no such thing exists, but Antares Systems' *Auto-Tune* software comes a pretty close second.

Auto-Tune is a software plug-in pitch processor capable of tracking the pitch of virtually any monophonic performance, then correcting it by one of two means. In automatic mode, the performance is shifted to bring it in tune with any desired scale entered by the user, but unlike rigid pitch-shifting devices, *Auto-Tune* enables the operator to determine the degree of correction,

PAUL WHITE *studio-tests the sound engineer's dream — a TDM software plug-in for undetectably correcting vocal and monophonic instrument pitching problems.*

you often find in budget hardware pitch-shifters. In fact, the only real limitation is that the program can't track chords or ensemble instruments — clean tracking can only be achieved on solo, monophonic instruments and voices, and even then some sounds that contain a lot of unpitched sound can fool it. For conventional voices or instruments, though, it performs surprisingly well.

AUTOMATIC MODE

In automatic mode, a conventionally styled plug-in window appears with just six on-screen sliders and a few parameter windows. The Scale window is used to select the scale type, which can be

pros & cons

ANTARES SYSTEMS AUTO-TUNE £529

pros

- Natural-sounding pitch correction can be carried out with no audible side effects.
- Easy to learn.

cons

- With Pro Tools III, it isn't possible to process sections of a file — you have to keep bouncing sections to a new track.

summary

A remarkable tool that can be used both to tighten up the pitching of a performance, or to salvage the occasional serious pitching error.

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ANTARES AUTO-TUNE TDM PLUGIN

- ▶ anything from an obscure ethnic scale to a simple chromatic type, and below this is the Key window. You may edit the scale if the types on offer aren't suitable for your needs.

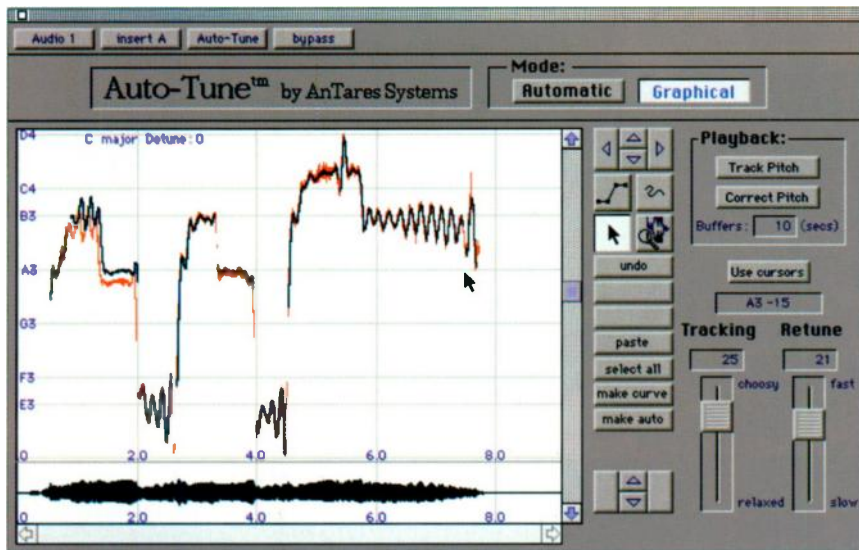
The sliders are separated into two groups, one for pitch correction and one for adding delay vibrato to

has a maximum range of plus or minus one octave.

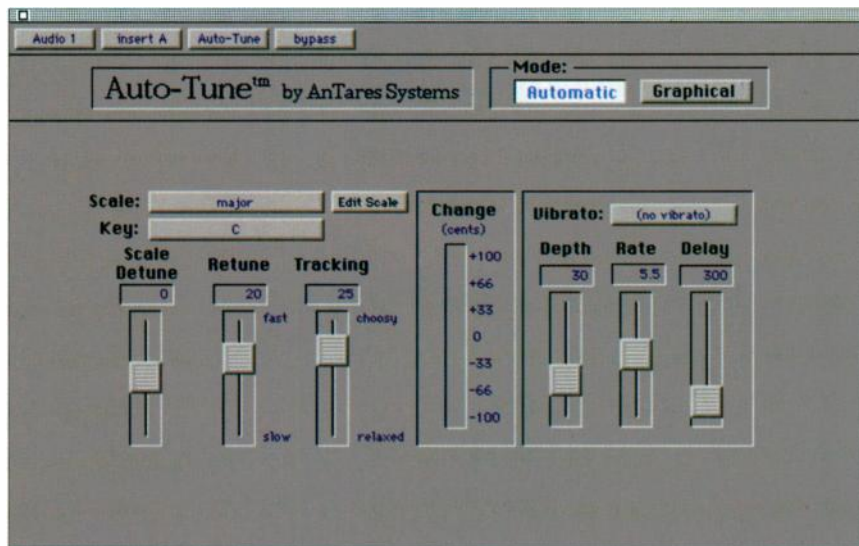
The vibrato section enables vibrato to be added to performances, and there's a range of modulating waveforms here as well as full control over depth, rate and delay. In theory, you could even strip out a performer's natural vibrato and then add your own, but this might sound unnatural in some cases, as the performer's own vibrato will probably be accompanied by level and timbral changes.

GRAPHICAL MODE

Graphical mode is best for correcting short sections of music where either the rate or extent of a pitch slide is wrong, or where the pitching is so far out that the automatic mode might push it a complete semitone out of tune. The process is fairly simple, and involves first playing the offending part while *Auto-Tune* analyses it. The resulting graph of pitch against time is plotted on a musical grid corresponding to the notes of the scale selected in Automatic mode, and after just a little practice you can see which notes are likely to sound out of tune. After analysis, the computer creates a black curve to match the red one on screen, and this may be edited using simple dragging, straight line or jointed straight line tools. Nobody sings bang on pitch, but the note should waver around the right note more or less



Auto-Tune in Automatic mode.



Graphical mode.

the result. Detune provides an offset for working on material that isn't in concert pitch, while Retune controls the rate at which the sound being processed is pulled towards the target pitch. If this is set too fast, the process will start to strip out the human features of performance, such as slides up to notes, or vibrato, whereas if it is too slow, the note will be corrected too late. Tracking strength is controlled by the Tracking fader, where a maximum setting gives the tightest tracking, and the minimum setting applies little correction. This is useful, as forcing every note to perfect pitch may sound a little artificial. A readout in the centre of the window shows the percentage pitch change being applied. Most of the time this should only be a few tens of cents, but the system

symmetrically. If it doesn't, you can either move the whole section of curve up or down, drag just one end of the curve (great for correcting dropping or rising pitches), or replace part of the curve with your own collection of straight lines.

Another useful inclusion in the graphical mode is a facility to create the pitch correction that would have occurred in Automatic mode. With care, Graphical mode offers almost unlimited scope for pitch correction — it's all down to how much time (and patience) you have.

TUNING UP

I used *Auto-Tune* with my Pro Tools III system, and as you might expect, the fully Automatic mode of

operation is the easiest to use. Indeed, if a performance is more or less OK, it may well be all you need to bring it bang into pitch. Even so, some user skill is involved, because if you make the pitch tracking too tight the voice seems to yodel from one pitch to another in a most unconvincing manner. Of course, if you're in the business of creating ethnic-sounding vocal samples, this can be a useful effect. Careful adjustment to reduce the speed of tracking and the degree of correction results in a very natural sound that is gently nudged towards the target pitch — it only falls over when the vocalist is so far out that the next note in the scale is closer than the desired note. Once you have the best settings, just play through the file and bounce it to a new track to make it permanent.

“Now there really is a way to fix dubious vocals.”

After playing with the system for a while, I've come to the conclusion that while the graphic mode might be a lot more time-consuming, you can achieve excellent results if you've the patience. With a little practice you can get quite quick at it, but there is one snag, which is largely down to the way in which Pro Tools handles plug-ins. You can't create a set of 'fix' parameters for a section of audio and then process it as you can in *Sound Designer* — you have to change the buss routing, bounce the section down to a spare track, slide the new section over the original, switch the monitoring back to the way it was, then move onto the next phrase that needs sorting. That's the only way I could find of making the change permanent, and you have to finish working on one section before you can go onto another, otherwise your work is lost. Trying to process too long a section of audio at once means setting up a longer buffer time than the default 10 seconds, and if it's too long, everything slows right down (30 seconds seems about the upper limit on my computer before things get annoyingly slow). What's more, you have to take care not to de-select the section of audio you're working on until the bounced track has been created, otherwise the pitch correction information won't be in sync with the audio — another legacy of Pro Tools. Ultimately, of course, you have to live within the confines of Pro Tools, and, in fact, restricting the sections of

audio you process to 30 seconds doesn't present too much of a problem.

So what about the sound quality? Providing you're trying to correct a vocal that is reasonably well sung in the first place, the results sound perfectly unprocessed. On a test piece involving a ballad with one note well over a semitone off pitch, it was possible to end up with a natural-sounding performance that I would never have guessed had been doctored in any way, although, as usual, excessive or unsympathetic pitch correction will result in 'yodelling'. In all, it took me less than 30 minutes to feel comfortable with the system. The only thing I couldn't do successfully was remove a fast, deep vibrato, because if you set the response too fast you get a trill, and if it's too slow, the vibrato remains. To be fair though, this isn't something you'd want to do often — you're more likely to want to fix basic pitching problems, or perhaps add a little delay vibrato to a flat-sounding voice.

SUMMARY

Auto-Tune is an exceptional piece of software that makes serious, undetectable turd polishing a reality! Now there really is a way to fix dubious vocals, although admittedly the more dubious they are, the more effort and tenacity it takes to come up with a perfect result. If a vocalist has made a reasonable stab at a track, the Auto mode may be all that's needed, and if there are just one or two very dodgy sections, you can fix those first in the Graphical mode, and then put the complete file through again on auto-pilot. There are very few things about the program that irritate me, though I found it difficult sometimes to grab just one end of a curve without selecting the whole thing instead, and though I dearly wanted to be able to press a Process button to make my changes permanent in the original file, I realise that Pro Tools III doesn't accommodate that way of working — and I'm not yet sure whether Pro Tools 4 offers a way around this particular problem.

In short, if you have a Pro Tools TDM system and you work with vocals, *Auto-Tune* is one product you can't afford to be without.

SO5

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It's easy to be derisive when you see, glancing through hi-fi magazines, that some people are prepared to spend hundreds or even thousands of pounds on a couple of metres of cable, or bypass their compact disc player with so many external 'add-on' enhancing boxes that there's only a minimal amount of the original player in-circuit. However, there are scraps of magic to be found amongst the hi-fi myths, and considering how many more cables and interconnections there are in a typical recording studio, if these tweaks do work, the benefits to the studio environment could be considerable.

At first sight, hi-tech musicians and hi-fi enthusiasts would seem to be poles apart in attitude. However, despite the incredible leaps in technology each year, some of the high-end hi-fi amplifiers are beginning to emerge in new 'retro' guise, complete with valves, since the cognoscenti maintain that some amplifiers designed originally in the '50s still sound as good, if not better, than many made today. But hang on a minute... Valve amps sounding better than solid state? Surely this

in both the hi-fi enthusiast's and the hi-tech musician's worlds.

SHAKIN' ALL OVER

One item that is *de rigueur* for any hi-fi enthusiast, but that rarely appears in the average recording studio, is the humble speaker stand. Although SOS has carried many reminders, over the years, of the benefits of supporting speakers properly and not sitting them on the mixer meter bridge, many people still take the easy way out and compromise the sound of their monitors. A loudspeaker cabinet can only give of its best when rigidly mounted. In larger recording studios, purpose-designed monitors are 'soffit' mounted directly into the front wall of the control room (giving them an extremely firm mounting), but any speaker simply placed on a meter bridge or perched on top of a rickety stand will itself be moving in time with the music. The signal in the loudspeakers ideally moves the cone like a piston, but unless the cabinet has infinite mass it is bound to move slightly as well. This equal and opposite reaction, particularly with the higher

BLACK MAGIC?

HI-FI TWEAKS IN THE STUDIO

Carbon-fibre cables, gold-plated connectors, contact enhancers and spiked, lead-filled supports — not a list of props from a science-fiction blockbuster, but a selection of the many accessories available from hi-fi specialist dealers. MARTIN WALKER enters the twilight zone to sort fact from fiction and discover whether any of this black magic can help in your studio.

will ring a bell with many musicians. Guitarists have known for decades that where warmth and 'musical' sounds are required, valve amps have always sounded better. And again, guitarists as a breed are quite happy to remove the factory-supplied pickups to fit specially wound ones in their place — surely these are 'add-on enhancements'? Recording musicians, even those who are firmly attached to solid-state technology, are happy to enter the world of psycho-acoustics and use enhancers. It is not unusual to find an ADAT preceded by an 8-input valve interface to add that certain something to an otherwise digital chain.

So perhaps there's not that much difference between the two camps after all — certainly not at the upper levels, where pro and semi-pro gear often comes from manufacturers who have a foot

energies at the bass end, will cause a 'muddying' of the sound — in effect, a mechanically induced distortion of the music signal. Many hi-fi speaker stands are also designed to be filled with dry sand (or even lead shot!); as well as damping any resonance in the stand, the greater mass will provide further stability and rigidity.

In addition, stands are often supplied complete with 'spikes', which are designed to invisibly pierce a carpet so that the stand is better coupled to the more solid floor beneath. This ensures a level and stable base, but the use of spikes is controversial. Since sound travels faster in solids, it is possible that some sound will reach you via the stands before the airborne part arrives, particularly if you have floating wooden floors. Some people prefer to spike the stands to the floor to make them rock solid, and then put neoprene or lumps of Blu Tak between the speaker and stand to add a little 'give' — not enough to compromise rigidity, but sufficient to prevent too much coupling of cabinet-borne vibration to the stand beneath. Others prefer to spike the speakers to the stands, and then decouple the stands slightly from the floor by using rubber feet. There are no hard and fast rules.

Although stands can tighten up the bass end of the signal, giving a tighter and less 'flabby' sound, they will also have significant effects in the mid- and high-frequency ranges, giving a more focused and detailed sound across the whole frequency spectrum. This is not mumbo-jumbo. If there are high levels of bass signals, the high frequencies will be emerging from slightly different positions as the cabinet vibrates. At 10kHz, the distance in air between minima and maxima of the waveform is about 8mm, and if the whole loudspeaker cabinet is vibrating, you



Atacama speaker stands could let you hear what your speakers are really capable of. The SE1000S shown here are 1 metre high — high enough for most studio use.

Target Audio supply a huge range of stands for speakers and other equipment, designed to help you extract maximum quality from your existing boxes.



can hardly expect high frequencies like these to remain focused.

A second issue is that by using a stand that places the loudspeaker significantly above the level of the mixing desk, the effect of reflections from the top surface of the desk will be smaller. Typically, with the speakers perched on the meter bridge, the distances involved will result in a compromised mid-range performance, due to reflections interfering with the direct sound. You can quickly test this out with your own setup by placing acoustic tiles or a few duvets over the mixer to absorb these reflections. You will need about four inches of thickness to affect frequencies down to about 200Hz — and if you hear an improvement, it's time to move the speakers! If you mount the speakers in 'free space', you will also get a cleaner sound.

In the past, finding stands high enough for use in studios has been tricky, but some manufacturers are now producing stands up to 1 metre high. Atacama is one company with an enviable reputation in hi-fi circles. Their SE1000S stands fit the bill nicely, but they also provide a bespoke service for recording studios, making any size of stand to order, at a slightly higher cost. Target Audio also have a 1-metre stand (the MX100) in their range, but this will only suit smaller and lighter monitors.

BAD VIBES

At the other end of the audio chain, vibrations can affect CD, DAT, DCC or ADAT players, amplifiers, or indeed any other electronic equipment, either indirectly, by aggravating the microphonic effects of certain electronic components, or directly, where moving parts are involved. Although vibrations may only be present at extremely low levels, they may still be sufficient to

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HI-FI TWEAKS IN THE STUDIO

- ▶ slightly colour the sound. Capacitors are one of several electronic components that can be affected, producing a voltage in response to mechanical vibrations. Again, you may think this sounds bizarre, but try turning up your amplifier and tapping the cases of other equipment — my Boss SE70 effects unit certainly produced audible sounds from the speakers!

The solution is to further decouple the equipment from the source of vibration, by using absorbent feet made out of a material such as Sorbothane or neoprene, or even lumps of Blu Tak. One company that has been mentioned before in the pages of *SOS* is Spectra Dynamics (in the Widgets section of the October '95 issue). Their range of Deflex panels and Foculpod feet is made from a specially formulated low-resilience polymer that has "exceptional shock absorbing properties", and works well when you need to isolate sensitive equipment from vibration. The most likely candidates for isolation include DAT and CD players. Again, you may be surprised at how much vibration you can feel on the casing of your equipment when playing music at typical levels in the studio.

FIRST CONTACT

Moving from mechanical to electrical problems, one of the prime candidates for improvement is dirty or intermittent contacts. Hum levels due to earth loops may vary, especially if plugs are

“Many hi-fi tweaks are like herbal remedies — people try them out and they work, and it's not until some years later that scientists finally come up with a rational explanation.”

removed and re-inserted, because this wiping action tends to clean the contact, effectively establishing a new hierarchy for loop paths. Radio interference can also be a problem, since leads will tend to act as aerials, either reproducing faint



Spectra Dynamic's products can take the shake, rattle and roll out of your equipment.

radio stations in the background at low levels, or be prone to periodic breakthrough from passing taxis and police cars. Dirty contacts can also cause a loss of low-level detail, by adding a small amount of noise due to varying contact resistance. Two products widely used by the hi-fi brigade are contact cleaners and enhancing fluids. As with various other hi-fi tweaks, these are definitely not the 'snake oil' that you might suppose. In fact, a casual look at typical advertising blurb shows that these fluids are widely used by the likes of Ampex, Dolby Labs, and Switchcraft.

Contact cleaners work by dissolving the oxides and sulphides that form as surface corrosion (this occurs with most metals to a greater or lesser extent), leaving a much cleaner surface. However, if you look at the average jack plug/socket contact under a microscope, it would resemble nothing more than a tree trunk lying on a plank — touching in various places, but certainly not the smooth contact that many people would suppose. Between the actual points of contact exist small air gaps. After the surface contaminants have been dissolved, an application of enhancing fluid leaves a thin film that fills many of these voids, providing a much larger total contact area and giving

RUNNING IN

Most mechanical and electrical devices will benefit from 'running in'. Speakers, in particular, will sound harsher when first taken out of the box. This is because the moving parts have a certain initial stiffness that eases up after a few hours of use. For this reason, you shouldn't judge your new speakers until they have 'eased up', and this is why the demonstration models in the dealer's showroom will

normally sound much better, as they have been well run in already. Many speaker manufacturers recommend running speakers continuously for up to 24 hours before active listening takes place.

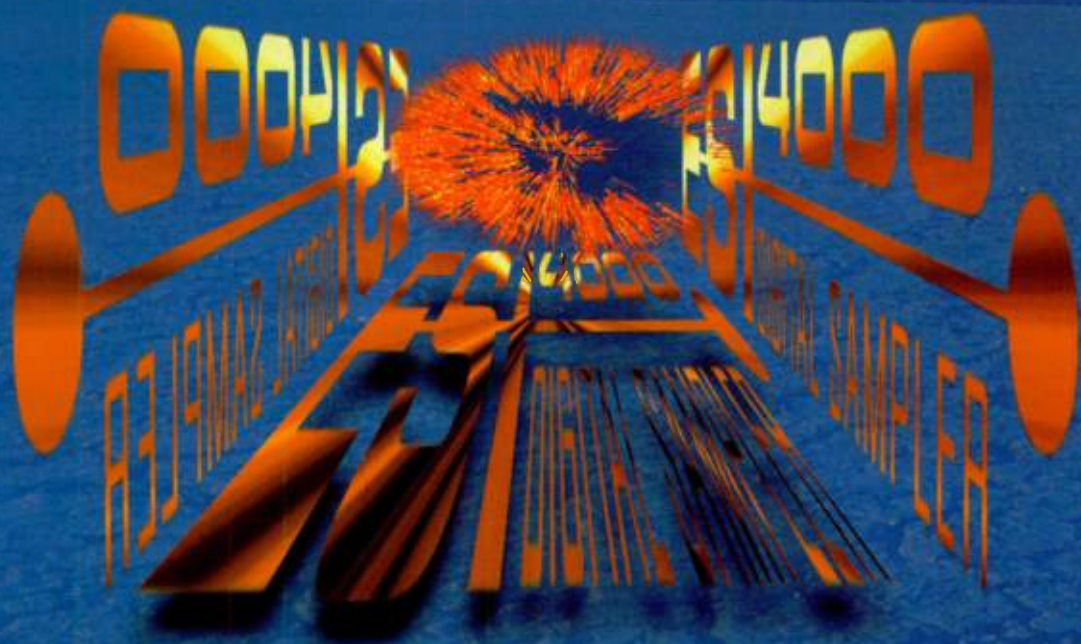
Electronic equipment also benefits from this process. Some components change slightly in performance after being used for a few hours, and manufacturers will obviously design them to sound best over the long term. This applies to amplifiers, CD players,

and, indeed, most other audio equipment — most will have a more 'relaxed' sound after being used for a few hours. However, large capacitors used for decoupling and smoothing can eventually become less effective after a number of years. If you have any equipment over 10 years old, and suspect that hum levels are not as low as they used to be, this may be the cause of the problem.

Finally, it is also a good idea to let all electronic equipment 'warm up' for

at least 10 minutes before listening to it. It normally takes this length of time for the circuitry to reach a steady-state temperature (known as thermal equilibrium) and, again, this often results in a better sound, as all components will have stabilised as far as voltage, current and temperature are concerned. Amplifier temperatures will rise further when actually playing music, but this should have far less effect on the sound than during the initial warm-up.

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HI-FI TWEAKS IN THE STUDIO

- ▶ significantly lower contact resistance. A single wiping application will not only clean your contacts, but keep them in tip-top condition for months, or even years, by preventing further oxidation. The thin film also tends to migrate to the other side of the contact, so that, for instance, cleaning your plugs will ensure that some of the film will end up on the socket as well. Although these solutions can be expensive when bought in concentrated bottle form, unless you need to use them regularly, you can now also buy them as packs of impregnated 'wipes'. A single wipe will provide enough fluid to clean a few dozen plugs.



Contact cleaning and enhancing will let more of your precious audio signals through unscathed. DeoxIT and ProGold are already used by many professionals worldwide.

I've discovered the benefits of contact cleanliness the hard way, and have maintained for some time a regime of cleaning my plugs every few months, using wire wool or Brasso on mains plugs and isopropyl alcohol on all the rest. Alcohol will remove surface dirt, but won't deal with oxides or sulphide layers. Having now tried DeoxIT and ProGold (from Caig Laboratories, and available from Russ Andrews — see contacts box), I am never going to be caught without them again. The difference is

not just lack of RF interference, but greater low-level detail with all signals. This is simply because the contact resistance is so much lower and more predictable. Cleaning and enhancing works particularly well in the case of speaker and mains contacts, where contact resistance is more significant, but will improve any contact in the long term. It's well worth giving this a try — without contact enhancers, your jack fields may still resemble an avenue of tree trunks lying across planks!

MAGIC CABLES

No other subject produces more stifled titters in the musical world than that of exotic hi-fi cables. To the outsider, the idea of paying tens, hundreds, or even thousands of pounds for a metre or two of

THE PATH TO NIRVANA

If you want to try some of these tweaks out, the easiest way to start is by cleaning the pins of your equipment's mains plugs (particularly those of your CD player, mixer and monitor amplifier) with some wire wool or Brasso. If you get positive results, do the job properly with all your studio connections (mains, line and speaker cables) using DeoxIT and ProGold (or alternative products such as Tweek). Use DeoxIT first for maximum cleanliness, then wipe off and apply ProGold to enhance the clean contacts. Your patchbay will probably be

the worst offender, and you may be surprised at the amount of extra sonic detail that emerges.

Along the way, discard all cheap audio cables with moulded plugs, and replace them with good-quality plugs and cable (oxygen-free, if you like). As even PC soundcard manufacturers start to put gold-plated sockets on board, it is easy to lose sight of the fact that unless they maintain a positive contact, even a solid gold plug and socket will be compromised. In the case of the humble phono, widely used for soundcards, consumer DAT

players and hi-fi equipment, the best plugs are those with a split central pin that can grip the socket, and an outer collar that either has a twist-locking action, or a set of slots that expand slightly when you push the plug home.

When making up cables, make sure that the connections between plugs and cable are mechanically sound before solder gets anywhere near them (solder should ideally not be used like glue, but instead only to support an already sound metal-to-metal contact). Finally, buy a pair of speaker stands of the appropriate height, and experiment with spikes, Blu Tak and rubber feet.

ALCHEMY

In ancient times, alchemists sought to discover the secret of turning base metals into gold. Nowadays, even humble jack plugs from Tandy can be bought with the base metal already plated in gold. The reason for this apparent extravagance is not to lower the contact resistance, but to make it more consistent. Gold doesn't corrode, so contacts plated with it won't degrade as they get older and less shiny, as most other commonly used materials do. This would largely seem to render contact cleaners (mentioned elsewhere in this article) redundant. However, due to gold's soft and porous nature, and the fact that it is difficult to bond it well to base metals, an oxide layer can often form

between the two, producing tiny 'blisters' that compromise the contact area. Also, to keep costs down, the gold is often extremely thin, soon wearing through to expose the base metal. In general, gold-plated plugs and sockets are an improvement, but they will still benefit from enhancers like ProGold. Even if there are problems between the base metal and the top gold layer, ProGold is designed to penetrate the plated surface to molecularly bond to the base metal and seal and protect it. In the long term, it will not 'gum-up' either — some cheap spray contact cleaners leave an oily film that attracts dust, which is not exactly what the doctor ordered.

“Without contact cleaners, your jack fields may still resemble an avenue of tree trunks lying across planks!”

cable seems totally bizarre. Line-level cables made from exotic materials such as carbon fibre, plated with silver or rhodium, or even made in solid silver, sell by the bucketload for hi-fi purposes. Unfortunately, most come only in the phono-to-phono variety, so the only way to audition them is to buy a length of bare cable (if available) and wire it up yourself. One of the most common materials quoted is Oxygen Free Copper (OFC), and even the level-headed Studiospares (and the SOS mail order pages) feature this. In fact, all copper cable contains impurities, but OFC normally refers to particularly low levels (typically 40 parts per million, rather than 234ppm for normal copper). Using this type of cable is said to reduce non-linearity when passing signals.

In the real world, as long as output impedances are low and input impedances are higher by a factor of a hundred or more, the theoretical effects of different line-level cables are debatable. Even using materials such as carbon-fibre conductors, which result in resistance values a hundred times that of copper, excellent audio results can be obtained. For studio use, often a more important parameter is that of shielding. A cable that protects the audio signal from hum and noise, often caused

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HI-FI TWEAKS IN THE STUDIO

► by wall-wart power supplies, computer monitors or dimmer lighting, is arguably more important.

One of the trickiest subjects to discuss is that of speaker cables. For years, nearly everybody assumed that as long as a 'thick' low-resistance cable was used to minimise power losses, the composition of the cable was unimportant. Indeed, many of

CD, DAT and so on. A few years ago, many 'consumer' DAT recorders contained somewhat indifferent converters, but today's models have been much improved.

As even humble PC soundcards begin to sprout digital I/O sockets, using external converters makes far more sense — if you can keep the signal in digital form within the PC, and only convert to analogue in the relatively clean electrical environment outside the PC casing, far fewer opportunities exist for interference and degradation. One DAC that has been mentioned in these pages before (see the Digital DIY feature in the July 1996 issue of SOS) is the DACMagic, from Cambridge Audio, which is now available in an improved Mk2 version. It's competitively priced, gained excellent reviews, and has the added advantage of providing three selectable inputs (two co-axial and one optical), switchable from the front panel, and both balanced XLR and unbalanced phono analogue outputs, plus a digital output. Unlike most other models, it also accepts all sample rates from 32 to 48kHz, rather than just the 44.1kHz used by CD players. Prices of mass-produced hi-fi converters tend to be more competitive than specialist rackmounting devices, so if you have an application where you need to listen to several digital signals, this may be just the job.



Using an external D/A converter could make any DAT or CD sound better. At the budget end of the market, Cambridge Audio's DACMagic has been described as superb value.

the first so-called hi-fi speaker cables were really just thicker versions of the bell flex that normally came bundled with the average hi-fi system. Using a thicker cable not only made the speakers sound marginally louder for the same amount of power, but they were also better controlled, since, effectively, the output of the amplifier was more firmly attached to them in an electrical sense.

However, the connection between an amplifier and speaker is a complex thing, composed of resistance, capacitance and inductance, not only of the cable, but also of both the amplifier and speaker, and tiny variations in one or all of these three can have an audible effect. The main thing to point out is that different cables do sound different, especially when they're passing complex musical signals. With a standard 8Ω speaker, a dynamic variation in the speaker cable of eight millionths of an ohm would generate a signal 60dB down on the original signal.

The huge problem is that, due to the complex interaction between the amplifier, the cable and the speaker itself, what sounds good in one person's system won't necessarily work in another. Active speakers, which incorporate the amplifier into the speaker cabinet to remove the need for a separate speaker cable, bypass many of these sorts of problems. Certainly, if you have any choice, always shorten the loudspeaker cable, even if this means extending the line-level cable to the amplifier. By all means try out a few samples of hi-fi cables (most reputable hi-fi dealers will let you borrow a few for a day or two to audition them), but don't get sucked into the black hole of finding the 'best' cable. Such a thing is the Holy Grail of hi-fi design; the perfect cable does not exist.

GETTING CONVERTED

There's as much money spent on external digital-to-analogue (D-A) converters for CD players as anything else in the hi-fi world. These do have a direct application for musicians, since they can be used for any digital signal, such as those from

TESTING TIMES

Some of the so-called 'improvements' are merely changes, and, as many people find to their cost, highly system-dependent. Some tweaks do not stand up to rigorous A-B-X testing, where they are swapped in and out of circuit to audition the differences or improvements. When you want to hear an improvement, your ears can often deceive you, and it is perfectly possible for you to imagine you're hearing a better sound when played exactly the same thing twice in succession.

If you want to actually measure the changes brought about, the main problem is that, whilst audible, these tweaks often affect the signal in subtle ways that are difficult to quantify. As we have seen with dithering systems in digital audio (and which, incidentally, do make a mathematical and defensible improvement), changes in an audio system can be heard even when lower than 100dB down on the peak signal level. Although this sort of signal level is still measurable, the problem arises when trying to measure subtle ambient detail — the sort of audio changes that occur when we musicians employ enhancers and the like. There may well be an audible improvement, but coming up with a way of actually measuring it is more difficult.

Many hi-fi tweaks are like herbal remedies — people try them out and they work, but it's not until some time later that scientists finally come up with a rational explanation. As long as you're not spending silly amounts of money, it is certainly worth keeping an open mind about such things, and using your ears as the final judge.

CONTACTS & PRICES

Most manufacturers will be happy to supply catalogues of their full range of products.

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0171 827 9827.

£ DACMagic 2Mk2 £149.95
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For anyone who has a PC soundcard but no easy way to enter musical notes, this add-on keyboard bundle could be just the answer, explains MARTIN WALKER.

There has been a gap in the market for a low-cost music keyboard that provides an easy way to enter note data into a PC multimedia computer. After all, nearly all modern machines come complete with a soundcard, but, even if you have music-making abilities, it's not much fun using a typewriter-style keyboard for musical purposes. Over the last few months, several musical add-on keyboards have appeared in quick succession: first the Evolution Music Creator Pro (see January's *SOS* for a review), then the MIDI Composer reviewed here, then the MIDI Master Pro distributed by Time & Space — so manufacturers have obviously spotted this gap, and are attempting to fill it!

The 'Pro' tag is common to all three, and refers to the fact that, unlike some miniature 'pianos' that are just enhanced toys, all three of these products have full-size keys and feature velocity sensitivity for far more expressive playing. To succeed, such low-cost keyboards need to tread the fine line between features and cost — too many features and the cost starts to approach that of low-end synths; too cheap and they lose the features that attract potential users. Interestingly, all three packages mentioned have the identical price of £120 including VAT, leaving us free to compare features alone. Let's see how this one stacks up...

The MIDI Composer package is manufactured by Quickshot, a name that will be familiar to anyone who has ever bought a joystick for games use. It's

distributed in the UK by BCK, whose range of keyboard accessories has helped out many musicians over the years. In essence, it is a four-octave (49 keys, C to C) keyboard that is designed to plug into the MIDI port of a soundcard. Although, obviously, it's not mechanically comparable with the sort of keyboards found on £1000+ synths, it still features a fully sprung action with velocity response, separate pitch and modulation wheels, and a selection of extra controls which allow all of the basic parameters such as volume and program changes to be sent directly to your MIDI gear. This makes it nicely self-contained, and saves having to launch extra software utilities or editors just to change these settings.

The keyboard comes in the grey/buff colour that most computers seem to adopt, and for this reason the MIDI Composer would undoubtedly look smart in a multimedia setup. Both of its competitors come in black, as does most other MIDI gear, so this basic choice may influence your decision if you care about colour co-ordination! On the left of the keyboard is an angled control panel, with a neatly grouped set of additional controls. At the top is a three-digit LED display, and beneath this four buttons: a Power switch, MIDI/Select (described below), and two buttons that allow the four-octave range of the keyboard to be moved up or down, an octave at a time, so that the keyboard can generate the full 10-octave range of MIDI notes from 0 to 127. To the right of the LED display is a multi-function slider, used to set parameter values, and at the bottom of the panel is a centre-sprung pitch-bend wheel and an unsprung modulation wheel. ▶

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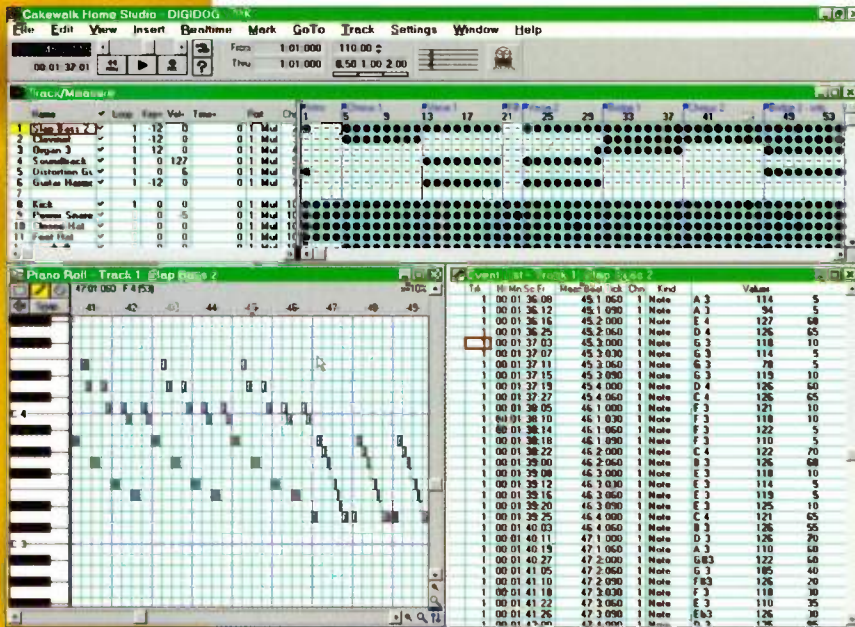
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QUICKSHOT MIDI COMPOSER



Cakewalk Home Studio, showing some of the many editing options.

GIVING IT A SHOT

The keyboard connects directly to the standard 15-way D-type connector found on most soundcards (see the 'Getting The Juice' box), so I connected it to a SoundBlaster AWE32, flexed my fingers, and started playing. The keyboard action is certainly useable, but I initially found it rather unpredictable in response, with some notes emerging far louder than others. Although this was no doubt partly due to my uneven keyboard technique, I was greatly encouraged to find that the velocity response of the keyboard is user-adjustable. Pressing the 'MIDI/Select' button puts you in a new mode (with the display now showing SEL) where pressing one of the notes on the music keyboard selects one of many functions to allocate to the 'Data Entry' slider. Each of these functions is printed on the keyboard casing just above the relevant note. So, for instance, to adjust the velocity curve, you press Data Entry, followed by 'F# below middle C' (where it says Velocity), and finally Data Entry again to confirm your choice and return to normal keyboard mode.

Once I had done this, and tweaked the keyboard response to suit my playing style, it felt far better, and I was encouraged to try further tweaks. Among the other parameters on offer are aftertouch (not available from the keyboard itself), volume, chorus and reverb depth, pan, controllers, and program changes. You select program numbers by using the top octave of keys, which acts as a numeric keypad. The keyboard's MIDI-channel output can be set in a similar way, using the bottom octave of keys to select the channel. In practice, this is all far easier to use than it is to write about, and I was soon happily playing away, changing sounds, and adjusting reverb, chorus and pan settings direct from MIDI Composer. Both

the pitch-bend wheel and modulation wheel also worked well, feeling quite natural to use.

BUNDLES OF JOY

Something that always enters into the equation with bundles is the value of the extras. MIDI Composer comes with the 15-way D-type lead between keyboard and soundcard, a MIDI cable, a sustain pedal, and the promise of lots of bundled software, which includes Cakewalk Home Studio. The sustain pedal, though pretty basic, is functional, and a very useful extra for pianists, but I was initially a little disappointed with the software. The box shows screenshots of eight additional software packages, including *Power Chords Pro* and *Musicator version 2.1*, but on closer inspection these all turn out to be demo versions, which might mislead a few people. The only full package included is *Cakewalk Home Studio* — easy enough to use, but what you get is only version 3.01, copyright 1994. Although it works perfectly well under Windows 95, its age is rather apparent when you notice that the accompanying *Virtual Piano* program (which is a computer-key piano player, and really what MIDI Composer is designed to supersede) has an option for PC speaker support. I haven't seen anything like this for years! The *User's Guide* even has warnings about not using Windows 3.0 drivers.

Having got that minor moan out of the way, I found *Cakewalk Home Studio 3.01* actually not only useable, but quite comprehensive. Although the Arrange window is rather more graphically basic than some, editing options include piano roll, event list, controllers, staff (notation), and lyrics (text entry). There are no audio-recording facilities, but you can trigger WAV files at any

“Real musicians do it with full-size keys!”

point in a song, and, with a little thought, this can work very well. A user's guide is also supplied, and this is helpful, informative and concise. There is a range of demo tracks in the standard *Cakewalk WRK* format supplied with the program, but there are also an additional 347 standard MIDI files on the demo CD, and these are great fun to wade through if you like pot-boilers such as 'The Yellow Rose Of Texas' and 'Air On A G String'. Once I got going, *Home Studio* proved far more accomplished than I'd initially expected, and pretty well in line feature-wise with the competitors' offerings (*Evolution Audio* and Steinberg *MusicStation*).

Of course, this software is effectively being supplied free of charge. If you want something more up to date or advanced, you may already have had another software sequencer package

pros & cons

MIDI COMPOSER £120

pros

- Good value for a full-size keyboard.
- Touch sensitivity.
- Comes complete with basic sustain pedal.

cons

- Bundled software is old but functional.
- No mains adapter provided.

summary

An entry-level keyboard and software bundle that should get plenty of people started, with the added bonus of starting you on the *Cakewalk* path.

SOUND ON SOUND

GETTING THE JUICE

The keyboard can be powered in three ways — the two obvious ones are by batteries (for those with large bank balances) or using an external power supply (the back-panel socket needs a source of between 7.5V and 9V DC). A power supply is not supplied with the package — but before you reach for your pens to write those letters of outrage, let me mention that the third option is to power the keyboard direct from your soundcard. All you do is connect the supplied cable between the back-panel 15-pin D-type connector, and the similar connector that appears on many soundcards

(normally used to attach joysticks or MIDI-socket adapter leads). The keyboard then takes its power direct from the PC, and I'm sure this is the way that 99% of people will use it.

A second 15-way D-type connector appears on the back panel of the keyboard, and you can use this to plug in the cable previously disconnected from your soundcard to make way for the MIDI Composer. The standard MIDI In and Out sockets provided by the soundcard lead will then reappear. In addition, a standard 5-pin DIN MIDI output socket is provided on the back panel of the MIDI Composer for directly attaching further MIDI devices.

supplied with your soundcard bundle. As it stands, the only full package in this bundle is *Cakewalk Home Studio version 3.01*, and it's rather cheeky to claim that this is worth £99, as that's the full retail price of the newest version 5.0, currently being distributed by Et Cetera. However, Et Cetera did tell me that anyone wanting to upgrade from 3.01 to this latest version would only be charged £35. This could be well worth doing, as version 5.0 includes a 32-bit native Windows 95 edition, and both the Windows 3.1 and 95 versions allow up to four tracks of audio to be mixed with up to 256 MIDI tracks — in contrast with the 3.01 version, which allows only a single WAV file to be inserted.

KEY FEATURES

MIDI Composer is first and foremost an entry-level keyboard, and at £120 it would be good value for anyone who already has a soundcard, but needs a way to start actually producing music. The action of the keyboard is perfectly adequate, and should suit most people — especially once you've tweaked the velocity response to your satisfaction — but I would advise you to try it out to see if you're happy with it. The other controls work well: although some people might prefer to have additional buttons in order to avoid using the musical keys for control functions, in practice

you get used to this very quickly. Including a basic sustain pedal is a nice touch — even £1500 synths are unlikely to come with these. If you want to get started on a 'real' keyboard, have a good look at this one, especially if you already have a sequencer. As I'm sure it must say in the back window of somebody's car — real musicians do it with full-size keys!

SO5

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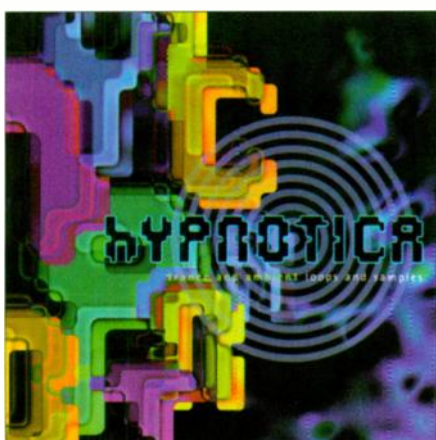
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HYPNOTICA (AUDIO CD)



Hypnotica is an audio sample CD comprising single samples, loops and backgrounds, most of which have a sci-fi feel to them. There's the '50s 'whoo-eeee-whooh' theremin sci-fi tension cue, complete with delay, plus lots of whooshing, sweeping, pulsing, burbling things that suggest everything from the endless vistas of infinity to the aftermath of a particularly virulent curry. Think *Space 1999* meets *UFO* with a hint of Radiophonic Workshop circa 1960, and you'll be pretty close to the mark. As the disc progresses, the sounds seem to get more adventurous, and there are some nicely eerie processed choral vocals, ghostly backgrounds, alien machinery and cybernetic gibbering.

What's most impressive about this disc is the volume of material supplied and the variety of atmospheres, from *Deep Space Nine* to deep fried swine, taking in fear, relaxation, the supernatural, alien environments, bubbling toxic waste and a fair share of pure, unadorned cheesiness. The sounds don't have the weirdness or depth of something like *Distorted Reality*, or Ian Boddy's *Ambient*, and there are no multisamples, but they are nevertheless useable within the context of trance, ambient, and atmospheric composition, and a few are extremely good. There's a lot of this kind of thing around at the moment, so I'm not going

to go overboard with the points, but something on the bright side of three should be fair.

Paul White

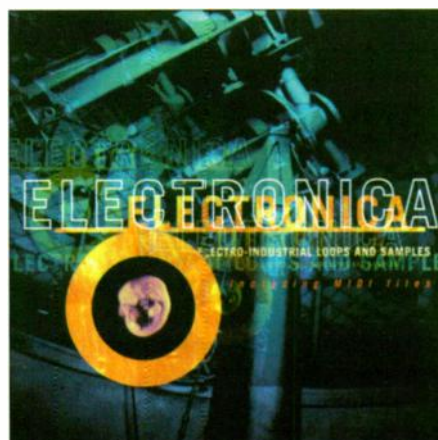
£59.95 each including VAT.

ELECTRONICA (AUDIO CD WITH MIDI FILES)



Electronica is a collection of processed drum and percussion loops that fit loosely into the electro-industrial genre. Track one is a CD-ROM of MIDI files, so you can try out rhythms at different tempos, or substitute your own sounds. Many of the rhythms are fairly straightforward four-on-the-floor dance rhythms with a nice feel to them, though there are some purely electronic examples that are more like pulsating pads, and other variations that have less obvious time signatures. Many of the electronic percussion parts are treated via vocoders, resonant delays and other heavy-duty processors to give them a more synthetic feel, and even acoustic percussion is heavily disguised in most cases.

Metallic sounds, vintage analogue drum hits and trashy bright reverbs are quite popular, along with the odd filter 'thwip' and sweep, and it's obvious that some industrial machinery has been co-opted for some of the samples. Few people realise how relaxing a flanged angle grinder can be! Tempo information is supplied for each loop, and there are also individual samples of the various sounds to use with the MIDI files.



The disc concludes with over 25 'kits' of individual samples, plus a few more odd kicks and snares, and though there's nothing here that I haven't heard done before, the range of both rhythms and feels is very wide, with tempos ranging from the 60s right up to 170bpm or more. If you're fed up with predictable, TR909/808 drum loops, you just might find something more subtle here.

Paul White

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SOUND CUBE (PC/MAC CD-ROM)

The Sound Cube is a 10-CD set from Best Service that's intended for 'Multimedia and Music Production'. All sounds are provided in three formats — 16-bit 44.1kHz files in both AIFF (Mac) and WAV (PC) formats, as well as 8-bit, 16-bit AIFF files at 22kHz. It's tricky to balance multi-disk collections to appeal to the widest selection of people, but Best Service have made some good choices, with a varied choice of musical genres and a wide range of sound effects that will suit multimedia (and musicians with imagination!). One slight down side is that, despite the supplied *Surfer* program that appears on each CD (which shows and auditions the contents of all 10), there is no manual. However, the main selling feature of this batch has got to be price. You can buy a single CD for £12.95, or all 10 in a flip-top box (the Sound Cube) for £89.95, which works out at £9 each. I think I'd better stand aside, or I might get killed in the rush!

VOL 1: DANCE INSTRUMENTS ●●●●

A set of fruity bass synth lines in various keys starts off this collection, followed by female and rap vocals, and then a useful selection of natural and synth drum sounds. Fretwork follows, with guitar power-chords, riffs and solo phrases in several keys and tempos (including nice lines in Hendrix, country picking, and *Shaft* wah-wah riffs), then horn section stings, 80 loops (mostly of the drum variety, but some including bass guitar), and organ, sax and synth sounds and phrases. Although most of the loops are grouped into two folders at 120 and 140bpm, many instrumental phrases give no idea as to tempo, and there is another folder labelled 'Loop Mix' that adds to this temporal mystery. If you like dipping in and trying things out, this is for you, but finding something specific could be time-consuming. Overall, quite a comprehensive selection of 450 files totalling 96Mb — not as big as some dance compilations, but plenty to get your teeth into.

VOL 2: ORCHESTRA & CLASSIC ●●●●●

Four folders provide Basic (sustained notes and chords from single instruments and various orchestral groupings); Choirs (various notes,

chords and effects with a large male/female ensemble); Female (more of the same, but of the female persuasion); and Orchestra (useful full orchestral phrases to cut and paste, or to use as pad atmospheres). The sound quality is superb, and for classical ensembles you can't find much better. All of these sounds come from products such as *Orchestral Colours* (five-star rating in *SOS* February 95) and *Classical Choir* (five-star rating in *SOS* November 1993), which still sell at £59.95 (Audio CD) and £149.95 (CD-ROM) for the full versions. If, like me, you want access to the sounds, but don't need more than a selection to raid for your own music, this single CD gives you arguably the best selection from several hundred pounds' worth for a gob-smacking £12.95!

VOL 3: VOICE SPECTRAL ●●●●

Here we find ourselves in voice synthesis and vocoder territory, with added solo female gospel snippets, a batch of sacred choral ensembles, and a bizarre selection of alphabetically sorted voices from 'Aaahs' (human and robot), dance phrases — 'Feel the Beat' — and yodelling (filed under 'J'), to various screams, ending up with 'Yeah' and 'Yo'. It's fun wading through these, and there are many excellent sounds hiding in here, but I wouldn't like to find an appropriate one in a hurry. Overall, a good vocal selection that would find uses in many areas.

VOL 4: WORLD FX — HOUSE & LEISURE ●●●

Not ethnic samples, but sound effects (obviously, recorded in different places around the world!). They're divided into two main folders: 'House' contains bathroom noises, clocks, doors, kitchen implements and so on; 'Leisure' contains games (roulette, one-armed bandits and so on), mixed (cameras, barrel organs, snooker) and sports (mainly crowd sounds at various sporting events). The sound quality is good, but with some incidental background noise, and these are mostly in mono, although a smaller stereo selection is also provided in a separate folder. However, musicians should not dismiss this volume — these are just the sort of sounds that, in a different context, would provide wonderful and unusual percussion.

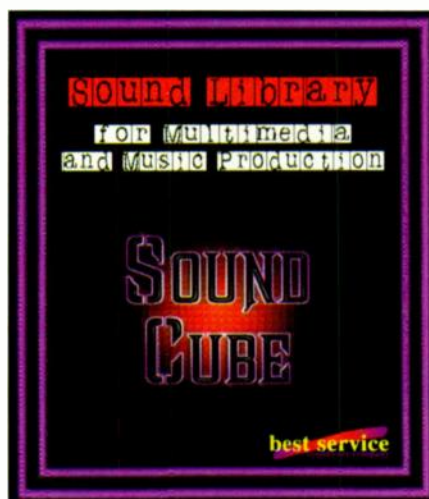
VOL 5: WORLD FX — BUSINESS & TRANSPORT ●●●

The Business section contains industrial machines and robots, office equipment (plenty of phones on offer!) and a fax machine. Transport covers areas such as planes, trains, cars, bikes (anything from a moped to a Harley) and boats. The car selection is the most comprehensive, with not only engines, but also door slams, car horns, tyre squeals and so on. These sounds, along with many of those in volumes 4 and 6, are mostly culled from the two double-CD sets *Sound FX Collection* and *Film FX Collection* — I have the originals, and have used them extensively. My one caveat is that many of the longer engine or industrial atmospheres are

unlikely to fit into most projects, and are far too busy to extract spot FX from.

VOL 6: WORLD FX — ANIMALS & NATURE ●●●

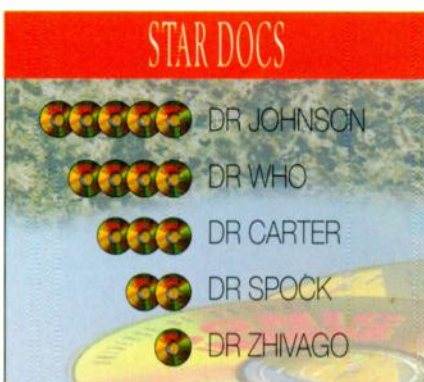
Animal noises this time, starting with bees and crickets, via plenty of dogs, flies and frogs, and finishing with wolves. More of the interesting ones have been left in than usual (most animal CDs have too many of the easy ones, such as



sheep and cows) but there is the very occasional bit of overloading (although I wouldn't have gone back for a second take of those howling wolves either!) The nature sounds have plenty of the liquid variety (fountains, rivers, splashes, sea, rain, hail), as well as various other weather conditions (hurricanes, blizzards, and so on). If you need this one, you'll be foaming at the mouth already...

VOL 7: CRASH BOOM ZAP! — TYPICAL FILM EFFECTS ●●●●

A very useable collection of weapons (pistols, shotguns, lasers), assorted footsteps, fight sounds, futuristic sounds, bleeps and bloops, this is more what the computer games fraternity needs. Again, though, the long atmospheres (wonderful though they are) will probably find less use. A couple of the kung-fu fight sequences probably came from a scratchy film, but the majority are of very good quality — and with 322 sounds with this much variety for £12.95, you can't really go wrong. If you use



your imagination, many things on offer here will also provide even more percussion sounds.

VOL 8: SOUNDTRACKS — CYBER ATMOSPHERES ●●●

Some wonderful textures here, obviously using a wide range of expensive equipment (such as the Technos Axcel Resynthesiser). If you need to chill out, there are some long, evolving, spatial pads, as well as some shorter effects that escaped from Volume 7. The Libertus folder contains eight files, averaging 7Mb, with lengthily developing stereo riffs — lovely to listen to, but only possibly useful for Multimedia backgrounds. Finally, four fully blown ethnic loops from around the world — more long loops, but with far more flavour than those in the previous folder. This disk is a bit of a mixed bag: if you want something different, you might just find it here, but it'd be best to have a listen first.

VOL 9: ETHNIC JOURNEY — INSTRUMENTS, VOCALS, WORLD PERCUSSION ●●●●●

Reviewed in the depths of a British winter, this CD really cheered me up. First up is a taste of Africa (traditional dances, group percussion loops and vocal chants), then a dozen or so didgeridoo warbles, frantic gypsy accordions, guitars and vocals, Indian ensembles, percussion phrases, sitar riffs and vocal chants (some of these sound as if they were recorded out in the street — plenty of local flavour but some background noise). Next up is another assortment of Deep Forest material, plus prayer chants. Finally, the Oriental folder provides the inevitable shakuhachi, as well as plenty of percussion phrases and ensembles to round off our world trip. Totalling 197 files and 131Mb, this is another good all-rounder, and at this price an absolute steal.

VOL 10: RAVE X — HOUSE, TECHNO, JUNGLE CONSTRUCTION KIT ●●●●

The loops are grouped into nine folders by tempo, with most between 120 and 180bpm; a wide range of kit and percussion styles and sounds is on offer, as well as analogue synth sequences. There's also a good selection of synth bass sounds, stabs and effects, and, finally, a complete set of TR707 kit sounds. In all there are 270 sounds, totalling 73Mb — some are clean, some dirty (although the recording quality is very good throughout), some traditional, others more extreme. There's nothing very new here, but this collection is not trying to break new ground — simply giving a good basic selection to work with, and this it does well.

As an overall set, the Sound Cube is superb value — if you join the queue to buy one, I'll be at the front in my sleeping bag! *Martin Walker*

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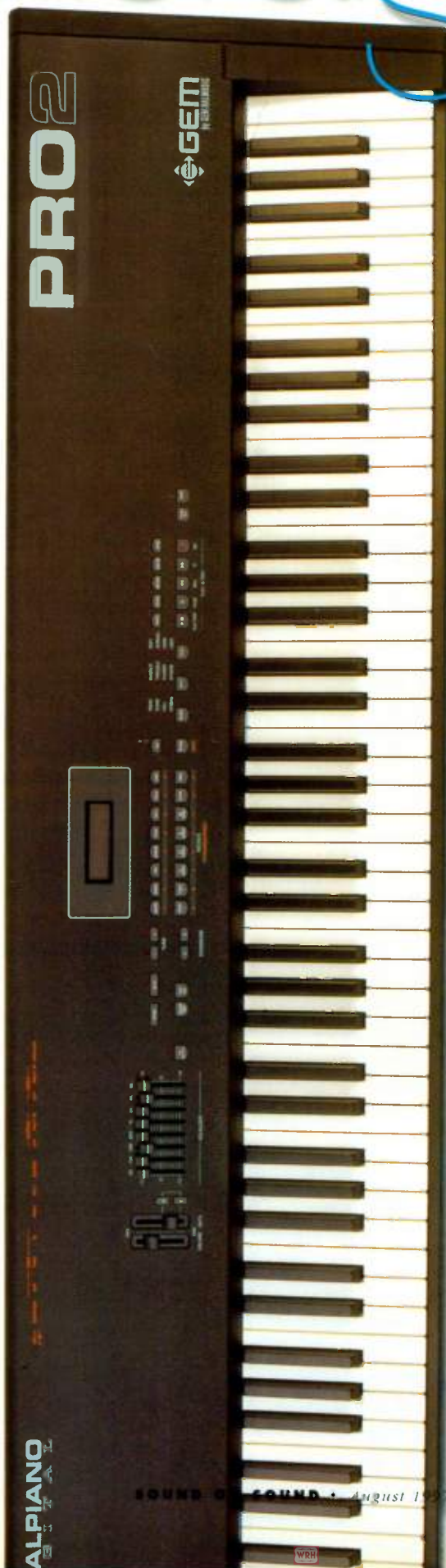
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GENERALMUSIC GEM PRO2 DIGITAL PIANO

One of the Holy Grails of modern music technology is the perfect electronic emulation of an acoustic piano. Most of the early analogue attempts are probably best forgotten, and it was only when sample-based technology came along that the synthetic piano began to sound anything like the real thing. The basic sound of a piano note is relatively easy to sample and replay, but the subtleties of tone and the resonance within an acoustic instrument are more of a problem. Generalmusic are the first company to combine a sample-based instrument with physical modelling techniques in an attempt to close the gap between technology and reality.

A WEIGHTY PROPOSITION

The GEM PRO2 features an 88-key, piano-weighted keyboard, with a simulated hammer action: it has a very agreeable, realistic feel, but does not transmit aftertouch, which is a shame. Audio reaches the outside world from a pair of standard quarter-inch jack sockets on the rear, and you can choose mono by using the left output alone. Similar jacks allow the connection of external instruments for mixing into the PRO2's audio. The addition of a pair of multimedia-style speakers is possible from a dedicated stereo mini-jack socket. MIDI In, Out and Thru are provided, as is a serial port socket for direct connection to a PC or MacOS computer. The PRO2 has provision for two assignable continuous/switching pedals in addition to the damping pedal input. Generalmusic strongly recommend the use of their proprietary 'continuous damper pedal' to more closely resemble the action of a real piano damper pedal. Unfortunately, I didn't have access to one, so I can't comment.

The first surprise that the PRO2 had for me came when I went to plug the power lead into the back. Considering the price this instrument commands, I was totally unprepared for an external power supply — I hadn't even checked inside the box for one! The external line-lump-with-feet 12V PSU sports a 2-pin shaver-type mains connector, and plugs into the rear of the instrument with all the reassuring solidity of a seaside bingo prize. I'd advise Generalmusic to take another look at this aspect of an instrument that purports to have been specifically designed for live performance!

The PRO2 works in one of two basic modes, accessed by the Sounds/Performance button. 'Sounds' are the raw presets, to which you can

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Gem PRO2



► apply key splits, layering, EQ, effects and reverb. There are 16 sounds in the PRO2, with three variants of each, offering differences in, for example, tonal character, or envelope timings. Layering sounds is simply a case of pressing two buttons at the same time. The PRO2 attempts to apply some intelligence to the process of layering, by making the first sound selected the louder of the two — nice touch. Key splits are achieved by holding down the Key Split button and hitting a key on the keyboard. The volume of the two sounds can be specified, along with the effect and reverb sends.

Sixteen reverb types are available, ranging from plates, halls and churches to slap echoes. A further choice of 16 effects can also be applied, including delay, flange, chorus and rotary speaker simulation. Two editable parameters are available, typically rate and depth, or delay time and feedback. The effects and reverbs are generally competent, and would certainly suffice as a quick and dirty way of adding a little acoustic depth, but for serious use I would have to advocate using a more sophisticated external device.

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pros & cons

GENERALMUSIC GEM PRO2 £1799

pros

- Realistic piano sounds.
- Realistic piano feel.
- Graphic equaliser.
- Computer serial port connection.
- On-board sequencer.

cons

- External power supply.
- Lack of on-board control options.
- Sounds other than pianos are of variable quality.
- No control pedals as standard.

summary

The PRO2 is unashamedly a piano first, a purveyor of other sounds second — and achieves a quality of results in precisely that order. If you need more control and a wider variety of sounds, you could be frustrated, but if a realistic piano sound and feel is top of your list, then you should give the PRO2 a chance.

SOUND ON SOUND

ALL THINGS BEING EQUAL...

To the left of the top panel are the eight slider controls that make up the PRO2's graphic equaliser. This is an excellent feature, allowing very specific tonal curves to be applied and stored with a Performance. A dedicated button switches the EQ in and out for instant comparison. It's also possible to 'lock' the EQ curve, which would be valuable in a live situation. One of the Performance edit pages gives a graphical representation of the current EQ curve — although, despite the physical sliders being centre-detented, the graphical display often failed to show the sliders as centred!

Various other edit options are hidden under the Performance Edit button, such as the assignment of the pedals to volume, expression, sustain, or sostenuto — or even to act as the sequencer start/stop switch. These pedal settings can be stored in a Performance, or globally 'locked' to prevent Performances changing the current assignments. A choice of microtunings is provided, such as meantone, Kirnberger or stretch tuning, and a further User tuning option allows each individual key to be tuned to the player's own liking. Detuning between two layered sounds is possible, as is the capability to delay one of the sounds. Auto-wah is also provided

for anyone who remembers '70s disco... The PRO2 offers a choice of three velocity curves, plus a further User setting applied by way of the data slider.

Once all these edits have been made, a snapshot of the current setting is stored as a Performance. Switching to Performance mode allows you to select these Performances from the central bank of buttons. The PRO2 holds 64 Performances in total, denoted by an 8x8 arrangement of letters and numbers. The lower row of buttons selects letters A to H and the upper row selects numbers 1 to 8. Performances are not selected until the number key is pressed, making it easy to pre-select a bank letter while you're still playing the current Performance, leaving the final button push until the last possible moment.

Since the PRO2 is very much a piano emulation first and foremost, this is where Generalmusic have applied physical modelling techniques to simulate the internal characteristics of a piano soundboard. 'Natural String Resonance' claims to recreate the harmonic 'ringing' of open strings as other keys are played across the keyboard. An easy way to demonstrate this is to strike and hold a low note, wait for it to decay, and then play staccato notes higher up the keyboard: the open note's 'string' ►

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PRO2 SOUNDS

- **Piano 1/RockPiano/BrightPiano:** Piano 1 is rich and realistic, with very authentic release characteristic. Variants are slightly brighter.
- **Piano 2/Honkytonk/Upright:** Piano 2 is darker, with a filtered release slope that lends it a less realistic tone than Piano 1. Honkytonk and Upright are OK, if a little cheesy.
- **El Grand 1/El Grand 2/El Grand 3:** It's a long time since I played a Yamaha CP70, but El Grand 1 gets pretty close by my reckoning.
- **Rhodes 1/Rhodes 2/Rhodes 3:** Excellent Fender Rhodes sound, marred only by the usual technique of making louder samples velocity-switch instead of crossfading smoothly.
- **Wurlitz 1/Wurlitz 2/Synwurl:** Throaty and brimming with '70s appeal.
- **DxPiano 1/DxPiano 2/DxPiano 3:** Timbre response to velocity doesn't quite match the original, but I doubt that many would tell the difference.
- **Clavin 1/Clavin 2/SynClav:** Clavin 1 is nice and spiky. The other variants are less successful.

- **Vibes/Marimba/Xylophone:** Realistic and fun to play.
- **Harpsi 1/Harpsi 2/Harpsi 3:** One of the most disappointing groups, in my opinion. The basic sound is more reminiscent of a muted trumpet.
- **Organ 1/Organ 2/Organ 3:** Plenty of punch, but the permanent percussion on 1 and 3 will become tiring if you are after a smoother pad tone.
- **Pipe 1/Pipe 2/Rockpipe:** Competent, if unexciting.
- **Strings/AtkStrin/Marcato:** Basic strings are fairly insipid and AtkStrin has far too long an attack time to be useful in all but the most forgiving of circumstances. Marcato has a good aggressive bite.
- **Choir/AtkChoir/SynChoir:** Hmm... Back to the drawing board with these, I'd suggest.
- **MuteSynt/SlowSynt/Analog:** Safe, GM-style synth pads.
- **StrBell/SlowBell/PercVox:** Fairly pedestrian digital synth-type sounds.
- **A.Bass/E.Bass/E.Bass 2:** All pretty good, once a little EQ has been added to beef up the bottom end.

► gently resonates in sympathy with the higher notes. This is a very subtle effect, and certainly makes a difference to the character of the instrument. Furthermore, Generalmusic's 'Advanced Release Technology' attempts to more closely mimic the way harmonics decay as the damper hits the string, and a fine job it does of it too.

CLUNK, CLICK

The collection of samples is generally competent, if a little pedestrian for anyone well used to the sophistication of contemporary sample-based instruments. Among the best are, perhaps predictably, the acoustic pianos, but the Electric Grand is a mouth-watering rendition of a Yamaha CP70 in all its plunky-clunky glory! The electric pianos are generally well represented, although I still object to the use of velocity switching to transpose between hard and soft sounds — a crossfade would be preferable. To be fair, Generalmusic are far from being alone in this practice. I found the most disappointing of the sounds to be Choir, which to my ears is bland and watery. Make no bones about it; the PRO2 is really all about pianos, and this is the job it does best.

I did, however, find some inconsistency in the way that the stereo piano samples are reproduced. Whereas you might expect a gradual sweep between the speakers across the keyboard's range, certain keys seemed biased towards the wrong side, or were too extreme for their position on the keyboard. When listening on headphones I also noticed a slight click on the very low samples, either as a result of their going into their loop phase or through distortion — it was difficult to tell. These problems are very subtle, and unlikely to be audible in all but the most demanding of situations, but I'd rather they weren't there at all.

The lack of pitch and modulation wheels is perhaps a handicap to a device with ambitions to be a master keyboard. The provision of a damper pedal socket and a pair of switching/continuous

control pedals mitigate this to some degree, but it seems a shame that the on-board control options are so limited. It would also be preferable if Generalmusic included a pedal with the PRO2 as standard. But the PRO2 does feature some very useful master keyboard functions, not least of which is the ability to connect directly to a computer's serial port, obviating the need for a MIDI interface. The MIDI channels of layered and split sounds can be specified, in addition to a 'Common' channel which will allow patch changes to select the current Performance. Simple filtering may be applied to both the MIDI input and the output. These MIDI settings are stored along with a Performance, although the PRO2 will allow you to 'lock' them, making the current settings global. MIDI System Exclusive dump is implemented, permitting the whole of the PRO2's internal memory, Performances, sequences and global settings, to be backed up to any device capable of storing it. Hidden in the MIDI functions is a parameter to alter the volume of the 'Piano Frame' — an attempt by Generalmusic to add more acoustic realism to the sampled piano by including the sound of the natural ambience, or 'ringing' of the higher strings in a grand piano's soundboard. Unfortunately, I found the result to be little more than an annoyingly tinny buzz behind the notes, lacking the depth and warmth of the real thing.

A simple 2-track sequencer is included in the PRO2's armoury. This is little more than a scratchpad affair, but is certainly welcome all the same, especially with its bank of dedicated buttons for instant access — no searching through pages of menus here. Tempo and time signature are programmable, and simple editing may be carried out with the erase button — the PRO2 even allows you to overdub on a previously recorded track. If it's set up prior to recording, the sequencer will remember layers, splits and effects settings and recall them on playback — a very nice touch.

CONCLUSION

So what's the verdict? If you are primarily looking for a realistic piano sound, delivered in a package with a realistic piano feel, then I'd be happy to recommend that you audition a PRO2. The extra sounds should be seen as something of a bonus in this context. If you're looking for a master keyboard with weighted keys then the PRO2 will certainly do the job, providing you can live with the small number of physical control options on offer.

SOS

“Make no bones about it; the PRO2 is really all about pianos, and this is the job it does best.”

THE PRO1 & REALPIANO EXPANDER

Generalmusic are also marketing a slightly cut-down version of the PRO2, in the form of the PRO1. The PRO1 is very similar to the PRO2 in many ways, but here's a brief run-down of the main differences:

- 64-note polyphony.
- Only one Variation of the basic sounds.
- Reverb types of Room, Stage and Hall only.
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- No User key velocity response option.
- No sequencer.

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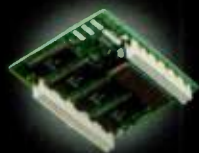
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James Asher

DOWN TO EARTH

James Asher made the transition from library music to successful commercial releases by tapping into an underlying demand for world-flavoured, rhythmic new age music. MARTIN WALKER takes a world view...

James Asher has had a long and varied career in the music business — his first single was produced by Pete Townsend in 1979, and he went on to return the favour by playing drums on Pete's 'Empty Glass' album. After writing and recording 23 albums of library music, as well as gaining a clutch of production credits, he has gone on to explore the wider horizons of world music, releasing a series of very well received albums. In 1990, his first commercial album release, *The Great Wheel*, reached number 13 in the Billboard New Age chart, staying there on and off for about two years. His second album, *Globalarium*, featured world artists such as Hossam Ramzy on Egyptian percussion and Joji Hirota on shakuhachi. The most recent, *Feet in the Soil*, is "an uplifting celebration of danceable energies centred in the earth", drawing inspiration from Aboriginal and African lifestyles, and has sold over 40,000 copies since its release last year.

Although James started his professional career as a drummer, he now considers keyboards his main instrument, albeit from a highly rhythmic standpoint. "I started learning violin when I was seven, and experimented with keyboards when I was 12. I always had a sense of self-expression on keyboard that I never had on violin, because nobody really taught me anything on keyboards, so it was wide open to interpretation. Playing drums has made me very rhythmically oriented. I always build things up from rhythm — that's my starting point."

CHILLING OUT

James has also been involved in writing music specifically for meditation purposes, and there is far more to this than meets the eye. "I've written music that has supported 'guided meditations', and here part of the job is being done by the voice. It's a process of supporting the voice — you're obliged to not occupy so much of the space. It's an interesting exercise to afterwards remove the voice and see what you're left with. By definition, there should be a lot of 'space' in the music. Most stuff that has a healing quality also has a hypnotic element. In one of the meditations, I was aware of deliberately changing the normal 60bpm of a human heartbeat to about 47bpm, and I observed my own physical breathing reaction to it; it did definitely slow down quite a bit."

"I write now in two distinct commercial styles. One is world beat, and *Feet in the Soil* is a good



example of this. It's a mixture of didgeridoos, hand percussion, djembe, flute, cello — that kind of thing. I still write music, as I have done for some time, in a more spacey, more conventionally new age style, although from a commercial point of view there's much more demand in the percussive area, because the spacey side of things has been around much longer, and therefore there's a much greater glut of product in that genre. I would never abandon doing the more spacey stuff, but in the past I've made the mistake of trying to put each of those genres into one product, and seen how it confuses people. I do tend to keep them separate now. I don't see them as elitist or purist world music products — I enjoy stuff which has a strong groove element, and which people who are not world music aficionados could enjoy. If you look at the success of Deep Forest or Enigma, they may have world music elements, but they're addressing a much broader audience. It's a bit like walking round Sainsbury's and seeing how many more exotic foods are regularly on their shelves. What was yesterday's extremist thing is much more acceptable now. Everything converges, and we're more global and broader in our tastes generally."

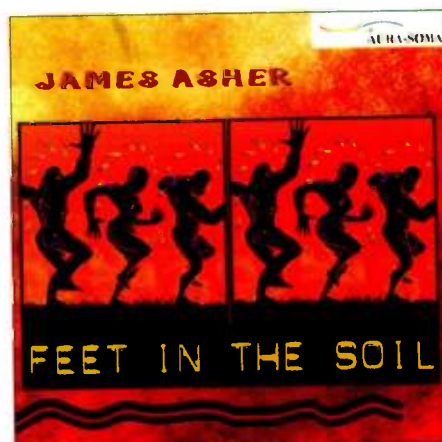
SAMPLE ELEMENTS

Choosing the sounds themselves is an important part of the process with any form of music, and I wondered whether James' ideas arrive after the sounds, or vice versa. "Ideas are very much suggested by sounds. I like to have lots of them [see gear list]. It's not as though you use sounds up, but there's a kind of creative relationship you have with a sound when you use it the first time, which is special. If it becomes a favourite you might well revisit it, but there's something about the first time you hear a sound that's very atmospherically suggestive. With MIDI, you can fool about with alternatives, or layering with other things, but it's the initial sound that inspires."

Since *Feet in the Soil* is drum-based, using not only selections from sample CDs, but also live percussion players, the distinction between live and recorded often becomes blurred, as does the distinction between organic sounds and machine sounds. "The first thing is to have good 'feel' in the original rhythm, and then it's what you do with it afterwards. Provided what you record acoustically is good quality, and you mix it tastefully, it's not always that discernible what started with you and what joined in halfway through. There are so many good samples around that started organic, so in many ways it's academic to make a distinction

between what's organic and what isn't. These samples are not 100% organic because they didn't originate in your front room, but there's still real playing there, and there's still a lot of 'feel' in the better sample CDs. It's amazing what's available — I'm just staggered by how good it's becoming. Sophisticated CDs like *Liquid Grooves*, for example, where you've got all these different permutations of the way a sample is offered. You've got the original beat, you've got a treatment with reverb, sometimes without the bass drum — a lot of flexibility. Then you've got add-ons, and now even remixes of grooves with processing. There are so many variations on how you approach the rhythm, and

"New Age has an extremely low profile — there's no airplay. If nobody's heard it, it remains a sub-current."



that's really how I think sample CDs should be, rather than having large sets of people playing, where you have to battle to hack out what you need. *Bongo Massive* is an example — you scratch your head to work out how to use it. *Liquid Grooves* is really ready to go."

THE GREAT 'SCAPE

James is a thorough convert to digital, in the form of the Soundscape system, and this has revolutionised his approach to recording. "If you're using something with the quality that Soundscape has, you've got much more available space to play with, because the accuracy of the sound leaves you with such an open palette in which to place things. If you compare its recordings to analogue multitrack, my Fostex G24 1-inch tapes have superb sound quality, but the realism and presence that you get from recording the same thing to Soundscape gives you a different level of clarity. Also, it has phenomenal EQ, and the ability to manipulate relative volume levels very easily throughout a track.

"Of course, it has its own in-built reverb, which is very fine quality as well, but the great thing is that you don't have to commit yourself. You can always go back a stage and reveal the original.

James Asher

- ▶ That's the great joy of Soundscape — although you've got eight tracks always available, you can have more tracks in standby, in ghost mode, and just call them up as you need them."

Digital technology obviously now plays a large part in James's Starfield Studios, but this was not always the case. "I've always fought shy of computer-controlled sequencers, through not liking to see too much, far preferring the dinosaur approach of hardware sequencers just because they're in my blood and I feel comfortable with them. So it was quite a major step for me to choose something like Soundscape. A friend whose opinion I respected suggested I look into it, and when I tried it out, I was incredibly impressed by

"There's a kind of creative relationship you have with a sound, when you use it the first time, which is special."

how friendly the user interface was — it was totally obvious from just looking at it what different functions were available as options. I'm currently using an early Version 2, although I haven't really got properly under way with that. I'm still using Version 1.18 as my main tool for editing and processing of up to eight tracks of audio. I'm really used to that. Version 2 is a giant step forward, with an extra unit and an accelerator card. You've then got the ability to have 24 tracks and a virtual configurable mixer page. But, like anything that's powerful, it's a two-edged sword: it has fantastic scope and new permutations and possibilities, but you've also got to spend the time

FAVOURITE GEAR

Those with sharp eyes may have noticed James' name in Paul Wiffen's review of the Akai MPC2000 hardware sequencer in the April '97 Issue. James has been an enthusiastic user of hardware sequencers for some time, starting with the Akai MPC60, then the 60 MkII, and finally the MPC3000. Having edited his sounds in the digital domain with Soundscape, using its large and comfortable waveform editor, James bounces his data into the digital input of the MPC3000

and plays it from there. "My only deep regret is that there is no digital output, and no possible retrofit. The new MPC2000 has both digital In and Out, but it's no substitute — it's only got two MIDI outputs, and won't read song data from the '3000. I'd like to see a new professional version of the '3000 with digital In and Out, and better memory expansion possibilities — up to 32Mb would be nice."

James' Digitech Studio 400 effects unit also works in the digital domain, and is an ideal partner for Soundscape —

sending tracks in for additional ambience or compression. James describes it as "excellent value for money, and one of the first with a digital I/O board." Another recent addition is the Korg NS5R: "I like the Korg a lot, for its compactness, and for the number of sounds it has. It's great to be able to put a daughterboard in it, and the editors for both the daughterboard and the Korg work well, and make me glad that I took the foolish step of embarking on the whole PC road."



James in his studio, Starfield.

to get used to it, and absorb and become conversant with those facilities."

Unlike previous versions of Soundscape, the new version only runs under Windows 95. After using a 486 PC, James thought the forced move to Windows 95 seemed a sensible time to upgrade to a more powerful machine — a Pentium 200MHz MMX. "It was more out of blind ignorance and fear as to what would happen if I tried to squeeze more out of my 486, which was becoming increasingly archaic. When I bought it, it employed the famous catch-phrase 'Pentium upgradeable', but when I queried this recently with my dealer I was told I'd have to speak to Intel themselves! It was a downhill path from there on. Goodness knows what clashes there might have been between the old and new Windows-format files." After using Windows 95 for just two weeks he's already found plug and play "too clever for its own good" when it auto-detects devices attached to it. "The first baptism by fire occurred when I tried to connect something to a serial port. Not only did it not work, but suddenly the computer became convinced that it didn't have a mouse any more. Discovering keyboard command shortcuts proved the only way to sort things out."

TAKING ON THE WORLD

James has been involved in new age music for a long time now, and admits that it is still a confusing term for some. "It rings all sorts of different bells for people. Where some people associate new age with travellers and protesters, others see it as the flowering of positive new philosophies. It has very different connotations. The way it's been in the past has left a lot of negative tracks for it to make its way through now. There have been unfortunate associations ▶

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James Asher

▶ with new age, particularly in this country. There's a judgemental attitude from some people, putting it down as an old 'hippie' kind of thing."

James is far more impressed with the attitude of other countries. "America has to be relevant to the new age thing because of the size and the volume it can cater for. I admire the more open-minded approach that the Americans have in this area. I went into a Tower Records in San Francisco

of about 50,000 people, and then Kevin Greening used to play music on GLR before he moved to Virgin. I don't know if he's still playing it now. These are tiny minority outlets. You also get the odd rather derisory program from Radio 3, having a slight chortle."

Part of the charm of new age, particularly in the UK, is that it allows local musicians a foothold in the music industry, via direct marketing to specialist shops, without needing to secure a record deal. "I see it as a very positive and exciting reality that people can have the direct experience of taking music to outlets, and seeing for themselves how it goes down. It's more instant and real as a form of communication than somebody delivering a product to a record company, who in turn process it in their own way before it gets out. There's also a meshing of several areas — ambient, soft psychedelic, trance, tribal, world music. There's a lot of interplay between all of those, according to whatever edge or angle people have on things; how 'hip' they want it to be; how much they go towards the hard-core 'healing' side. To typify it, you've got 'dolphins and flute' at one end of the spectrum, and Japanese drummers really going for it on taiko drums at the other — all of that is inter-related, in a sense, through the new age banner."

One of the biggest new age phenomena in the States at the moment is all things Celtic. Quite why this is so can partly be explained by the American love of everything Irish — and they seem to go for any form of Celtic music in a really big way. "Hearts of Space is an American label that had been peaking with individual artist's albums between 50,000 and 75,000 units. They suddenly took a quantum leap when they brought out a compilation called *Celtic Twilight*, which sold 300,000. This probably made them review closely how they wanted to proceed with different forms of music."

CROSSING BOUNDARIES

James has found out personally that being focused is very important. "In my experience, consistency is a highly desirable thing. Distributors and labels need to be able to quickly and easily identify what sort of product they're looking at. Something that's a bit of flamenco, a bit of ragga — a bit diffuse — confuses everybody. But the problem is often more to do with artists not having a coherent idea of what they're trying to communicate. Apart from the music itself, having a good title is another key thing, as is having a strong cover image. It's also important that the music delivers what the image promises on the outside. There are an awful lot of musicians who really don't know these things, and refuse to take responsibility for what they're doing. They offer it up as if it is someone else's job to deal with — "Oh, the label can handle that". If you're not clear yourself about what you're putting together, how on earth do you expect a member of the public, who is stressed out with information from all sides, to identify what's being offered?"

Once the music itself has a strong identity,



Part of James' formidable equipment arsenal, including a Roland XP50, JV1080, a Yamaha TG500, RM50, and CS1X, and Korg Wavestation SR and NS5R modules.

and there's a new age bin just like there's one for every other category of music. It would be foolish to try and summarise the whole of Europe — I've only just touched on some of it, but it does appear that Germany and Italy are healthy markets, each with individual slants. Germany has always had a tradition of supporting music and musicians, and in Italy it is more of a lifestyle thing, with regular cover-mounted CDs showcasing new releases."

I asked for James' thoughts on why a similar situation hasn't arisen over here, and why new age music is largely sold through the smaller specialist shops. "Radio doesn't help a great deal. I'm only aware of two stations that have notably played it. One is Radio Derby, which has a range

"A friend suggested I look into Soundscape, and when I tried it out I was incredibly impressed by how friendly the user interface was."

“I see it as a very positive and exciting reality that people can have the direct experience of taking music to outlets, and seeing for themselves how it goes down.”

James feels that the far more basic factor for wider acceptance of new age music is that it needs more public exposure. “You have huge marketing machines promoting the Spice Girls in every form, and you see them on every television show and hear them on the radio. This amount of exposure has to translate into how much people know about

a thing, want a thing, and then will buy a thing. New Age has an extremely low profile — there’s no airplay, and no TV show refers to it other than ‘the weird and wonderful’, ‘the occult and psychic phenomena’. If this is the only way it gets exposure, not surprisingly it remains very low-profile. Our Price records would have it on the bottom shelf in the most obscure place, because it turns over the slowest, because it is least supported by the whole commercial mechanism. This is the reality of what happens in this country, and it doesn’t make any difference what the innate value of the music is, or its ability to appeal to different people — if nobody’s heard it other than the minority of people who actively seek it out, it remains a sub-current.”

LOOKING FORWARD

Reaction to *Feet in the Soil* shows that it communicates to a wide audience, with positive feedback from India, Australia, Austria, Switzerland, Germany and Italy, as well as America and the UK. “People really enjoy drumming, because in an age when you’ve got far too much information coming at you, there is nothing more genuine to get back to than the beat — expressing something on a drum. In America there are drumming circles, and spontaneously at open-air events people will have a jam. It has a lovely quality — there are no rules, and it’s characteristically more American, in being less formal. We could do with more of that in the UK. It’s a lot more gratifying than wondering why this function won’t work with that function in the Utilities page on the PC.”

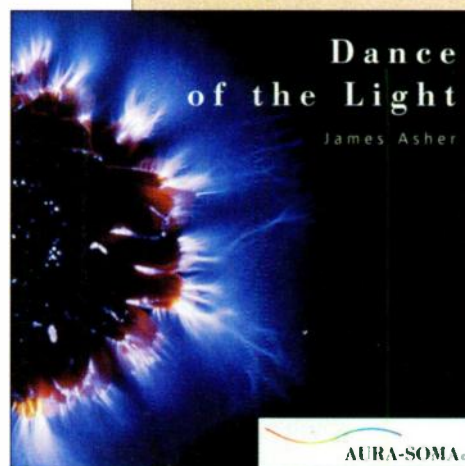
James is currently working on an Indian-inspired percussive project, and is very much looking forward to working with two people who will be pivotal to it. One is Sumeet Chopra, a talented tabla and keyboard player (whose sample CD, *Karma Chopra*, is available from AMG). “He has a very interesting vision of how the Indian culture can blend with more modern groove-led music — that’s what his sample CD is all about, and how I first knew of him. The other person is Johnny Kalsi, a dhol player who heads the Dhol Foundation, which is a very interesting and innovative concept. It has about 200 members in this country, and through this I also met Peter Lockett, an English percussionist who has a fantastic command of tabla and taiko drums. If you have inspirational drumming and percussion playing it provides a very exciting and inspirational backdrop to melodic parts. But when people are getting on with their lives, doing other things, the important thing is ‘Does this music touch me, or move me, and would I be motivated to put it on again?’”

In the case of James Asher, it looks as if plenty of people have already been motivated.



COMMERCIAL DISCOGRAPHY

<i>The Great Wheel</i>	(Lumina Music/ Music West 1990)
<i>Globalarium</i>	(Silverwave Records 1993)
<i>Dance of the Light</i>	(Aura-Soma Music 1994)
<i>Feet in the Soil</i>	(New Earth Records 1995)
<i>Rivers of Life</i>	(Aura-Soma/ Dance of the Light Records 1996)



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*Two channels good,
four channels better —
but 4-channel preamps
are thin on the ground.
HUGH ROBJOHNS has
succeeded in sniffing
one out.*

CLM Dynamics are a Scottish company based in Dundee who manufacture a range of specialist audio equipment. They describe the DB400S reviewed here as a no-compromise, extremely high quality, 4-channel microphone preamp. The unit has all the normal bells and whistles, plus built-in MS (Middle and Side) decoders and adjustable peak limiters. The decoders use a design called the 'WHIP matrix' (Wide Horizontal Image Plane) and they may be configured for converting the outputs of an MS pair into conventional L-R stereo, or — with a little lateral thinking and some bodge-leads — they can be used as a stereo-width control for normal stereo signals using a combination of all four channels.

HARDWARE

The DB400S is a relatively shallow 2U rackmount unit constructed in a steel case. The front panel uses clear white text on a green background to mark the control and switch functions. The rear

+4dBu levels to the semi-pro standard of -10dBV.

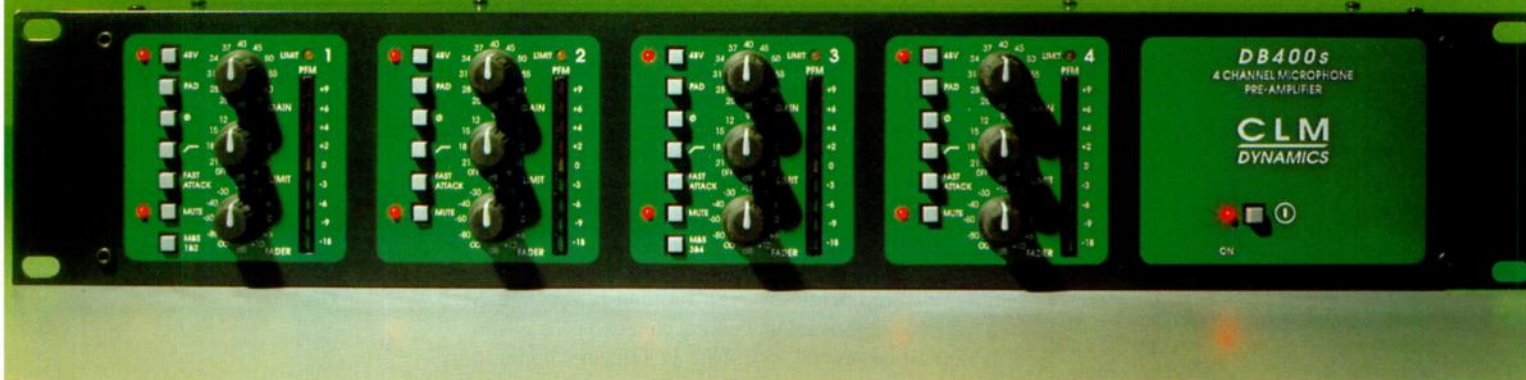
Internally, the DB400S is very well constructed, with each microphone channel housed entirely on its own PCB card. These are mounted vertically and run the full depth of the unit from front to back. At the right-hand end, another vertical PCB carries the power supply components; a large toroidal transformer is bolted to the side panel. Although I'm sure it is perfectly adequate, the mains power switch gave me cause for concern on a couple of counts. Firstly, the mechanical alignment of the PSU board was such that the button jammed in its panel cut-out and didn't operate reliably; secondly, the mains switch connections on the PCB seemed alarmingly close together. The panel has sufficient space for a decent rocker-style mains switch, and this would, I feel, be a significant improvement.

A ribbon cable daisy-chains across the tops of the audio cards carrying the power supplies and stereo cross-linking for the MS decoder functions. There are a number of handbag links on the circuit cards but these are concerned with configuring the cards as stereo pairs within the carcass.

The electronic components appear to be of

CLM DYNAMICS DB400S MIC PREAMP

4-MIKER



panel carries all the connectors, starting with an IEC mains socket (with integral fuse holder) on the left-hand side; there is no facility to change mains voltage, but a small grey push button just above the mains socket separates the chassis and signal earths to avoid hum loops.

Each of the four amplifier channels is equipped with three connectors. A 3-pin female XLR at the top of the chassis accepts a balanced microphone signal, and the amplified line-level output is made available through a 3-pin male XLR directly below it. Between the two is a standard 3-pole quarter-inch jack socket and a small grey push button. The socket provides an unbalanced insert point which can also be used as a line-level input (to take advantage of the MS decoders). It is wired so that the ring carries the send signal and the tip is return. The push button introduces a 14dB pad in the output signal to convert from professional

very high quality and most of the ICs are socketed, but, because the circuit boards are mounted vertically (which no doubt enhances the crosstalk figures), even minor servicing of the unit would probably require almost complete disassembly.

CONTROLS

The front panel is very clearly laid out, with four distinct sets of operational controls. Towards the right-hand end of the unit is the mains power switch — a small grey push button with associated red LED. As already mentioned, on the review model this jammed against its cut-out and did not instil confidence at all.

The amplifier controls are virtually identical for all four channels, the only difference being that channels 1 and 3 have an extra button to engage the MS-decoder circuitry. To the left of each section is a column of six (or seven) grey push buttons, with

three knobs arranged vertically in the middle of each section and a bargraph LED meter on the right.

The push buttons are used to select phantom power, a 20dB input pad, polarity reversal, a high-pass filter (24dB/octave at 80Hz), a fast attack-time constant for the limiter (10ms as opposed to 1ms), an output mute, and the MS decode (on the odd channels only). All are self-explanatory to use, and the only observation I would make is that, as is frequently the case with this type of push button, it is not always obvious whether a function has been selected. None of the buttons are illuminated and only the phantom power and mute buttons have associated LED indicators — although these are at least the two most critical functions.

The three rotary controls determine the input gain (25dB up to 70dB), the limiter threshold (+21dBu down to -6dBu with an off position), and an output fader with 10dB of gain above the nominal operating point. A single LED above the bargraph meter illuminates when the limiter is working, but there is no gain-reduction display as such.

The peak-reading bargraph meter is calibrated from -18dB up to +9dB, but this figure is relative to the output level that you've selected with the rear-panel pad. In 'pro' mode, the zero LED corresponds to +4dBu, and the top four LEDs have an automatic peak-hold facility. The zero point is shown on a yellow LED; higher readings are illuminated in red and lower ones in green.

IN USE

On the review model there was a minor typo on the rear panel, where three of the insert sockets are labelled 'Insert 2'. Perhaps, when this is corrected, a wiring diagram for the insert sockets could also be added. There's another rear panel-related quirk; if the unit is used to decode MS-originated microphone signals, the left output comes out of the right-hand channel (2 or 4) and the right output from the left channel (1 or 3). This is most unusual, to say the least; it goes against normal convention, and will undoubtedly cause confusion. On every other device I have ever come across that provides MS decoding, the sum signal is output from channel 1 (the left) and the difference from channel 2 (right). While this policy has been correctly adopted on the DB400S for its inputs, it is incorrect on its outputs — oops!

The DB400S is very straightforward to use and the unit works extremely well. The electronically balanced inputs reject interference well — I experienced no problems with buzzes or hums, even in quite hostile locations. The input circuitry is commendably quiet, giving rise to noticeable noise and hiss only at maximum gains; it also has masses of headroom.

Although I'm not a big fan of limiters, they do have their uses; the DB400S's circuitry incorporates a chip made by US company THAT to implement the dynamic control functions. The attack time can be switched between two settings to determine the trade-off between tight control and dynamic distortion, but the release time is automatically determined by the nature of the programme in relation to the manually set threshold. Release times vary between 0.3 and 3 seconds, and can be observed on the illumination of the associated LED, which seems to display the limiter control voltage directly.

In practice, the limiter system works well enough if the gain reduction requirements are modest and restricted to the occasional unexpected peak. Heavy gain reduction is not the forte of this design, but it never disgraces itself, even under severe provocation.

The high-pass filter is well chosen, and its steep slope makes it very useful for removing rumble or wind noise without affecting the programme quality too badly. The mute button seems redundant when there is also an output fader with which to kill the channel signal. The fader is well calibrated so that its position could be easily and accurately reset.

The MS decoders perform as expected (not withstanding the left-right output reversal) and their inclusion can only be praised, as they should encourage more people to experiment with this remarkably useful and flexible stereo technique. The handbook provides some sensible advice about setting levels on the M and S channels too, which is to be applauded.

Using the DB400S to provide a stereo-width control might appear rather complicated at first, but the system works and could prove surprisingly useful — for example, a normal stereo sub-mix of sources could be connected to channels 1 and 2 via the insert points (as a line-level input). The fader positions of channels 1 and 2 must be accurately matched to ensure that central sources are equal on the two channels, and the MS decoder button engaged so that the original L-R stereo signal is converted to MS. Next, the outputs from channels 1 and 2 are connected to inserts 4 and 3 respectively (because of the DB400S' reversed MS decoding matrix configuration) using XLR to A-type jack leads. The MS decoder on channel 3 is engaged to convert the MS signal from channels 1 and 2 back to conventional left-right stereo. Channel 3's fader is set to unity; channel 4's is used to control the stereo width. With the fader at zero, the output is pure mono; increasing the fader gradually widens the image until, at unity gain, the stereo image is the same as the original source signal. Increasing channel 4's fader beyond the unity position increases the stereo width further, eventually producing a 'hole-in-the-middle' effect. Confusing at first, possibly, but this is a powerful and creative technique that can be very useful indeed.

OVERALL

The DB400S is generally well built and performs to very high standards. I remain concerned about the mains power switch and the non-standard implementation of the MS decoder outputs, but these points are relatively minor, and could be quickly and easily remedied.

As a mic preamp, the DB400S is quiet, provides a useful gain range and good interfacing options, and is well equipped with both the expected and more unusual facilities. It's certainly worthy of inclusion on your shortlist if you are considering the purchase of a 4-channel mic preamp.

SOS

pros & cons

CLM DYNAMICS DB400S £1380

pros

- Intuitive to operate.
- Good sound quality.
- Very flexible facilities and interfacing.

cons

- Non-standard MS decoder configuration.
- Poor mains power switch mechanics.

summary

This is a well-equipped 4-channel microphone preamp with built-in limiters and MS decoders, and its high-quality circuitry provides quiet, capable mic amplification. A couple of minor engineering points spoil an otherwise excellent unit.

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Commercial Break

AMBER • TV MUSIC PRODUCTION

In just five years, Amber have become a successful transatlantic company producing TV ad themes and idents. PAUL WHITE finds out how it was done.

Tucked away in the west end of London, overlooking Oxford Street, is the UK office of Amber, a privately owned production facility specialising in putting sound to picture. The company was started when musicians Andy Carroll and Nick Amour met Michelle Curran, who now spends much of her time flitting between Amber's UK and New York offices, which are also connected via six ISDN lines to allow the real-time transfer of digital audio.

Andy and Nick were in a band together signed to Virgin Records, but after two albums that came to an end, leaving them in need of a channel for their talents. A friend in the business put them in touch with Michelle and the partnership developed from there. In 1992, Michelle formed Amber — she describes her role as business partner, producer, agent, cook and bottlewasher — and Andy and Nick joined as soon as their contracts with their former employers would allow. Currently, Amber's work comprises mainly commercials and TV idents, though they are also

doing some film work. Amber undertake creative and compositional work as well as the engineering side of putting sound to picture, and their newly refurbished building has a number of studio areas, including a dedicated sound-design suite based around two Yamaha 02R consoles, run by Ross Gregory. I spoke to Michelle, Andy, Nick, and Amber engineer Augustus Skinner (or Oggie, as he is more affectionately known).

Nick: "We're composers, and that's what we enjoy doing, but in this field it's important to get a foothold as a business. Quality control at every stage of the work is our guiding objective."

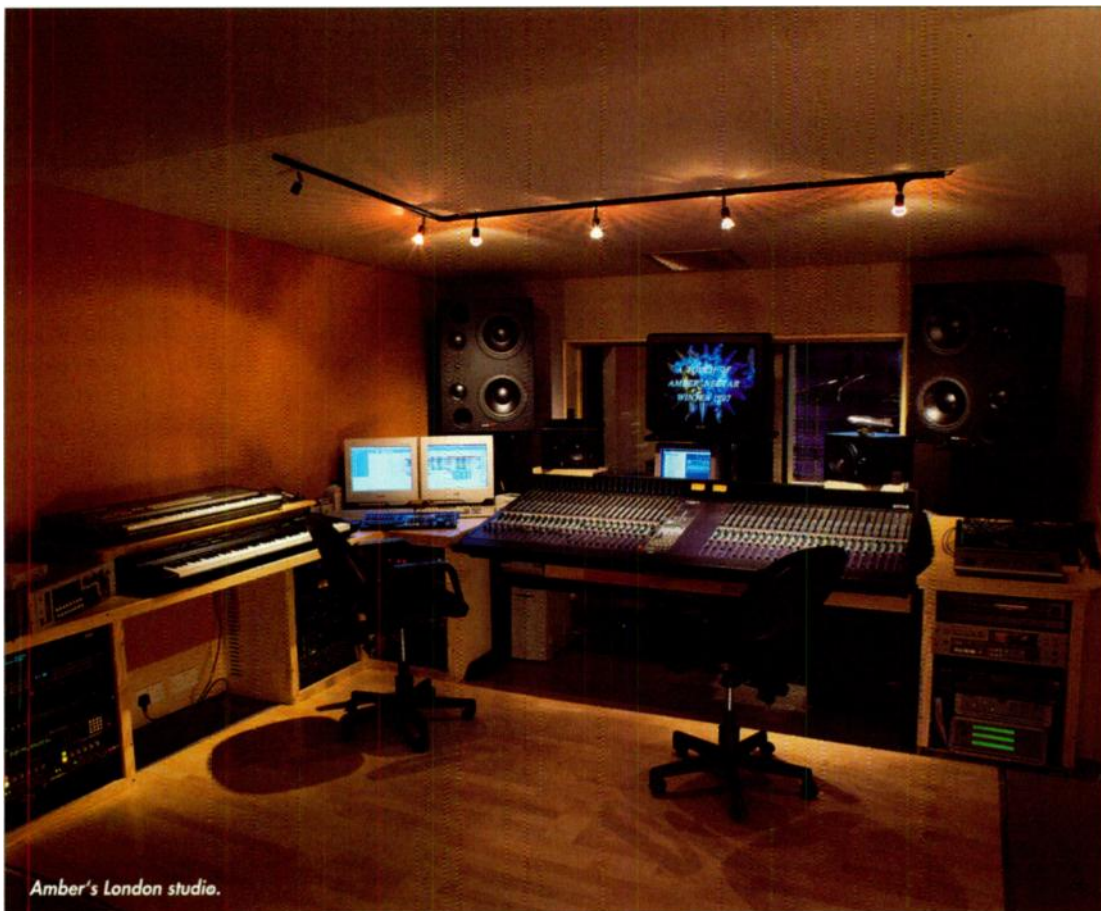
PROJECTS

Most of our readers are familiar with the process of making music, but perhaps less so with the mechanics of putting sound to picture. At what stage do you pick up a project?

Michelle: "Sometimes you're presented with a film that's finished and cut, but the agency isn't happy with what's been done so far, and there may be one or two specific directions in which they'd like to go. Alternatively, sometimes the client doesn't have a direction and it's down to us to come up with



Andy Carroll.



“It’s nice to have equipment that will let us make sounds

rougher around the edges.”

something. Other times we may be called in at an early stage to contribute ideas at the storyboard stage.”

Nick: “The picture always comes as a U-Matic cassette with burnt-in timecode, and a SMPTE Slave Driver is used to transmit SMPTE to the other devices in the system. Ultimately, we’d like to use the Mac to give us random access video from hard disk, but at the moment the cost is prohibitive. Working to Quicktime movies is not an option for serious work. Ultimately, random access would make the job quicker because we wouldn’t have to wait for tapes to rewind.

“On the audio side, we use an Otari Radar hard disk multitrack recorder alongside a Digidesign Pro Tools III system; when MIDI is involved, we also use Emagic’s *Logic Audio* running with the Pro Tools hardware. We’re very happy with the Radar system, because what you put down comes back exactly the same, and that’s very important. We were also concerned with reliability, so when we went for the demo at Syco, I asked them to switch off the power mid-session to simulate a power cut, and everything came back OK. That sold it to us. Modular digital multitracks just aren’t suitable for use in this environment, because they tend to be unreliable, and the lock-up time when you have multiple machines is far too long. Everything we do is backed up to Exobyte tape storage, both from the Radar and from the Pro Tools system. We don’t put too many jobs onto the same tape, so that, if the unthinkable does happen, we won’t have to recreate too much work.”

Oggie: “The Radar’s user interface is also very straightforward — it’s much the same as what a tape-based system has. It’s very intuitive: every button does what you expect it to. Projects can be saved as alternative versions, and we can offset

things as we like without having to mess about with sync boxes. You also don’t need a track for timecode. We don’t do a lot of editing on it — it’s used more to run everything through. The editing and scrubbing is a bit basic; it relies on your doing it by hand, and tweaking it by ear, so we tend to use Pro Tools for all the serious editing work. Pro Tools is used to record any live instruments — we can record a quartet or a band without losing anything. It’s also good for seamless compiling. If we have a 60-second piece and need to do a 20-second cutdown version, it’s not a problem. Pro Tools also tends to be very reliable; it doesn’t lock up or crash — much! Being able to do unlimited takes and call them back at a moment’s notice is just great.

“It would be great if they made a hybrid of *Logic* and Pro Tools because, at the moment, Pro Tools is better for audio editing, but it has very basic MIDI support. On the other hand, *Logic* has excellent MIDI support, but some of the audio editing capabilities are less flexible than those within Pro Tools. *Logic Audio* is the environment of choice when the project incorporates both MIDI

SOUNDS AND SAMPLES

Andy: “Much of the work is done using Akai samplers, but Amber also has its favourite in-house synths, including Emu’s Vintage Keys and Orchestral 2XR Proteus, a Morpheus, Clavia Nord Lead and a Memorymoeg. We’ve also invested in a Roland JV2080, and I love the Waldorf

Microwave — there isn’t a synth that sounds quite like it.

“We also have a good collection of commercial sample CDs, but you have to be careful how you use those because, contrary to what you’d expect, some of the material isn’t cleared for copyright-free use,

and we’ve been caught by this once before. Now, whenever we use a sample, we call the supplier and insist on written confirmation that the sample is cleared to use, because if it isn’t and you don’t check, then it all comes back on you, not on the supplier. Be very cautious — it’s better to make a nuisance of yourself than find yourself in court.”



Left to right: Nick Amour, Michelle Curran and Andy Carroll.

▶ programming and audio. Although you can cut and paste audio in *Logic Audio*, and you can draw in envelopes, it's much quicker to get from A to B in Pro Tools. Pro Tools also handles crossfades much better — if *Logic* could do that the same way, it would be great. Another thing I don't like about *Logic* is the way it files its audio. Unless you specify a new record path every time you open a song, all the record files are put in the last place audio was recorded, and they're not named after the song file they're associated with unless you name them yourself. It's just something else you have to think about. Pro Tools automatically creates a folder for each session, and all the files for the job go in the one folder."

Do you find yourself doing edits in Pro Tools and then re-importing the files into Logic Audio?

Oggie: "Yes, we've done that — if we've got lots of audio regions and crossfades in and out, it's easier to bounce that to disk, then import the finished file into *Logic Audio*."

"The hard disk recorders run with the Otari Status desk, because we've got the image recall. It's not as fast as the Euphonix, but it's essential to be able to recall a job to do a tweak here and there. Some clients come backwards and forwards two or three

times. The EQ on the Status is pretty good, but the mute automation could be improved in some areas. It has just update, read and write modes, but they're global: you can't change the status of just one channel — you have to do it for the whole desk."

How do you handle the stuff you can't program, such as outboard settings?

Oggie: "I come from a big studio background and I'm used to recalling sessions so, aside from the desk recall, the rest is a matter of logging the outboard gear, values, levels and whatever. You have to keep



Amber's effects and processing rack.

good notes. You also have to keep your ears open for anything that might go amiss, and you have to be quite thorough. You have to be prepared to stop a session in the middle, bring back an old project, and then return to the one you were working on."

SOFTWARE

Do you make use of TDM plug-ins with your Pro Tools system?

Andy: "We've tried a new one called *The Shaper*, which is an advanced multi-band compressor with a nice graphic user interface — it's very user-friendly. I think it's a Spanish product, and I believe that there's also a valve simulator in the range. However, we feel that software plug-ins are far too expensive, often costing as much as the hardware equivalent. After all, it is just a bit of software, and it doesn't have the tangibility of a dedicated unit. You can also tuck a dedicated unit under your arm and take it to another studio. To make plug-ins competitive, they're going to have to drop the price by a factor of two or three. On top of that, you still need DSP power to run them, and there's a limit to how many you can run in a typical TDM system."

Oggie: "What we really need is a good reverb that can be used internally within Pro Tools so as to help mitigate the limitation of having only eight physical outputs. The Lexicon Nuverb looks favourite at the moment, as it would allow us to submix certain groups of sounds inside the system with the right effect level. You can configure some of the outputs to function as effects sends, but then you further restrict the number of outputs you can use, and when you have a good mixer and a lot of

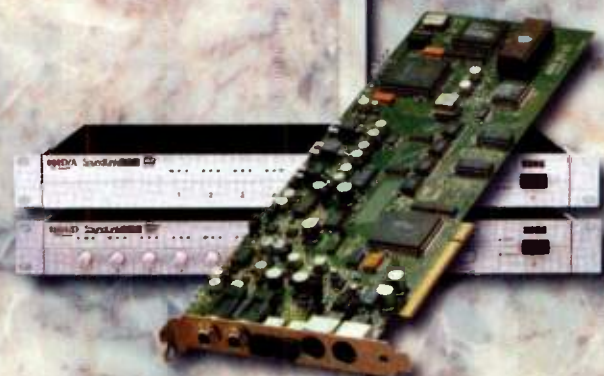
SOUND DESIGN

Andy: "We're very lucky to have Ross Gregory on board. He does sound design and a bit of foley work, and he's just fantastic. He's particularly good at combining sounds, and he has an EMS synth that he knows inside out. Often he'll double up the synthetic sounds with real sounds — he can make complete tracks out of just effects. Furthermore, he's very good at matching sounds to pictures, and what he comes up with is not always what you'd expect."

Ross Gregory.



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▶ tasty outboard, you want to use that; you don't want to have to mix everything inside Pro Tools. Computers are good for people who are restricted in their outboard or their choice of desk but, for those with a reasonable setup, they can be restrictive."

FAVOURITE THINGS

Nick: "We have two Yamaha O2Rs cascaded in the sound design studio, and we have another in our New York office. They have been exceptionally good: easy to use and they sound fine. It's a brilliant machine, and you can recall everything. I also have one in my studio at home, which is a converted garden shed!"

Oggie: "For top-end reverb, we have a Lexicon PCM80 and an Eventide H3000. That's an excellent box, and the reverbs are interesting and unusual. They sit in a track rather well and contrast nicely with our other effects boxes, the Sony MU201, Yamaha SPX90, and Roland RE55.

"For compression, we have the Joe Meek units and a Behringer Composer, as well as an Audio & Design unit and the SSL. I like the Audio & Design stuff; I think they're very good value for the money, in the style of a UREI 1176. The Joe Meek sounds really good, but I have to say that I think it is very expensive for what it is, at around £1500. The TL Audio Indigo EQ is very nice — they do have that lovely sheen at the top that you get from good valve equipment. The bottom end is also very warm. The APIs also give a classic, very sweet, '70s-style EQ. Our other favourites are the Roland RE55 chorus/echo and the Peavey analogue filter. The SSL compressor is another thing we like. We stick that across mixes, and record almost everything through it. It can be very invisible, but it can also be very punchy."

Andy: "A recent purchase, for the other studio, is the TC Electronic Finalizer, and we're very happy with it so far. That'll be used for mastering, and what I like is that, although you notice the difference, it's not like a really huge change — it's quite subtle, but very effective."

DYNAUDIO DYNAMITE

Andy: "This building was a wreck when we found it, and we had the whole thing done from scratch, but we're very happy with it. We're particularly happy with the monitoring, which is Dynaudio throughout. We tried out various configurations of amps and speakers, and never originally intended going for the big Dynaudios, but after hearing The Prodigy's 'Firestarter' through them, we just had to have them!"

Left to right: Nick Amour, Andy Carroll and Oggie.



ISDN

Nick: "The studio now has an ISDN setup with six lines, and that's being used regularly to send work back and forth between here and the New York office. Audio ties up all six lines at once, but it does mean we can use singers or session players in New York to add parts to sessions we're doing here. We were a bit dubious originally, but it's proved to be very solid and reliable."



"We've had enough of the way A&R people interfere with our music."

If the budget allows it, what would you like to get next?

Andy: "More outboard equipment. Sometimes we get asked to recreate a '70s-type sound or a vinyl sound, so it's nice to have equipment that will let us make sounds rougher around the edges."

I've had a lot of fun doing that lately with Steinberg's Grungelizer plug-in vinyl simulator for WaveLab...

"That sounds very interesting, but of course we'd have to buy a PC to use it. Are they thinking of doing a Mac version? It sounds like exactly what we need."

LOOK TO THE FUTURE

Obviously, this studio complex is relatively new, and there are still things to do, but what are your plans for the immediate future?

Andy: "Amber is growing at a healthy rate and we have a pool of musicians and composers now, so one of our projects is to set up an Amber record label or to produce albums and market them through other labels. With the amount of music being produced, it would be silly not to capitalise on that. Nick and I are also working on an album where we're doing all the initial work at home, then bringing the project in here to mix. We've had enough of the way A&R people interfere with our music, so now we can do things just the way we want to."



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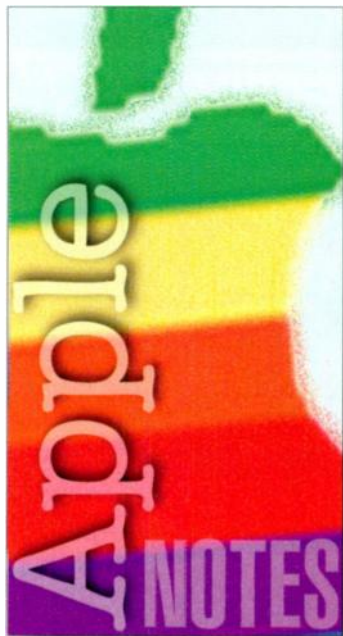
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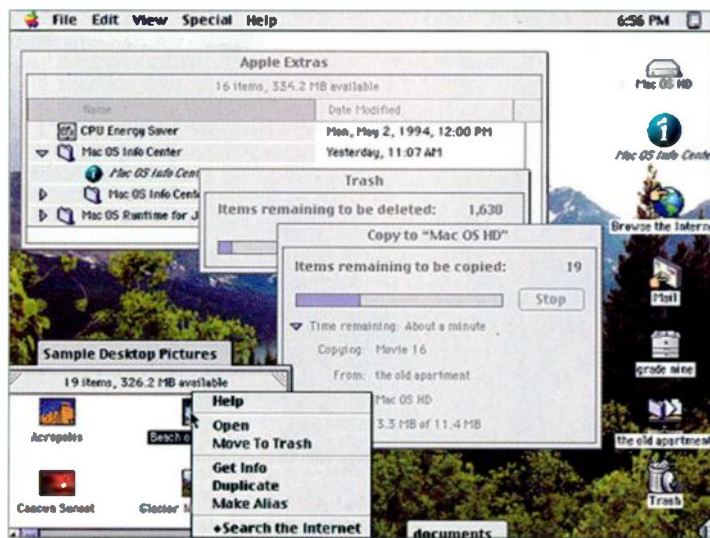
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After much ado, it seems MacOS 8 is finally going ahead. MARTIN RUSS brings you the latest Mac-related news and tips.

Just when you thought that news about new operating systems had been done to death, Apple announce details of the forthcoming MacOS8. So far, the details I've seen confirmed are restricted to a few intriguing aspects of the new Finder, although QuickTime 3.0 is also likely to be included.

The screen shot on this page shows some not-so-amazing features such as the new System Font, a big picture used as the background, and a Copy dialogue box that looks very like the one already available in Symantec's CopyDoubler. The pop-up menu that accompanies a Control-click on an object or window is also new, especially with the context-sensitive contents — and, in the example shown, it offers commonly used operations on a file. You can also see the Pop-up window tabs that can be stored at the bottom of the screen. Any connection with similar features in Windows 95 or NT 4.0 is coincidental — and the way that MacOS8 windows can be dragged



A first look at MacOS 8.

by the edges does not seem to be as useful as the Windows 95 resizing by the edges.

But some of the new features are more interesting: the Threads support that has been gradually appearing in MacOSs finally allows more than one file operation to happen at once — which is why the screenshot shows the Trash (Wastebasket) being emptied at the same time as the file copy is happening. But, more importantly, when a process in a window will take some time, control is handed back to the user while the processing carries on in the background, indicated by a spinning arrow in the window's header. This is rather like the background audio processing that you find in Mark Of The Unicorn's *Digital Performer*.

So, from just the evidence of the Finder, there are some new features, but quite a few are not as innovative as you might expect from Apple. Given the pain of the last couple of years of upgrades to System 7, MacOS8 needs to find a compelling reason for us to change. I'm still waiting.

CRASHING BORE

It happened to me. There I was, just writing Apple Notes, when I thought that I would save the work so far. Saving your work frequently is normally one way of protecting yourself from those unexpected crashes that sometimes happen. But in this case, my Mac crashed as I tried to save my work. And it happened again, and again.

At moments like this, when an application starts to misbehave, you suspect the application

first, so I re-installed it. Nothing changed. Distressing things like re-installing the operating system begin to come to mind, but then I remembered a tiny news item about something called the CFM68K Runtime Enabler — an extension called Code Fragment Manager. Apparently, this little system

extension (which first appeared with System 7.1, although it works with MacOSs up to the current 7.6.1) had an annoying bug: although it was designed to enable programs to run on both 68K and PowerMacs, it made 68K Macs crash.

Because the CFM68K Enabler is required by some programs, it tends to get installed as part of them, so there's the potential for lots of problems later. I happened to have found one of them. The easy solution is to look in the System Extensions folder and move the CFM68K Enabler out of it — put it into an Extensions (disabled) folder, and reboot. I did this initially and the problem went away. A better solution is to visit Apple's MacOS WWW site and download the latest update: version 4.0, which cures the problem. System 7.6.1, in fact, will only work with version 4.0.

NAME, RANK, NUMBER

Some things are just so simple they border on being obvious. But it's the obvious things that sometimes get missed. This glaringly easy way to determine whether your recent Apple Macintosh computer has a PowerPC processor inside almost escaped my attention...

If the number of your Mac model has three digits, then it is likely to be a 680n0 processor. But if there are four numbers, then it is probably a PowerPC.

So, for example, the Centris 610 that I use, the Quadra 700, the PowerBook 150 that I use when mobile, and the Performa 630 all have three digits, and they all have 680n0 processors: in fact, they are all 68040s. In contrast, the PowerBook 3400, Performa 6320, and PowerMac 9600 all have PowerPC processors. You can also extend this to the clones: *all* clones have PowerPC processors, regardless of their numbering!

ON THE NET

For an alternative view of the world of MacOS, then you could visit <http://www.macsurfer.com>, which brings together snippets of news from a diverse range of sources, and is thoroughly recommended.

APPLE NEWS IN BRIEF

• SPEEDING ALREADY

I made the mistake of mentioning last month that we could expect to see clock speeds of perhaps even 300MHz in MacOS machines by the end of the year. Well, here we are a month later, and the PowerMac 6500 Home Office has a 300MHz processor. The PowerBook 3400 has a 240MHz processor, and rumour still insists that the 500MHz processor is not

that far away. Thank goodness for the 30mph limit in some villages around here.

• NO PLUG-INS

For some time now, serious multimedia has only been available from a WWW browser if you start by downloading an audio plug-in; a MIDI plug-in; a Shockwave plug-in; and probably a few others too. Perhaps one of

the few non-plug-in bits of neat screen animation that's looking possible is the animated GIF picture. But this may be changing. Some of the latest multimedia programs now package themselves up inside a Java 'wrapping' that means they need no plug-in. Now I know that this was always the intention of Java, but it's good to see it finally happening. The days of the burgeoning plug-in folder may be numbered.

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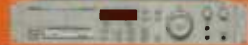


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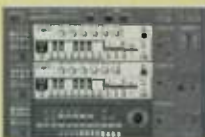
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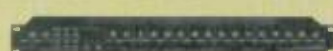
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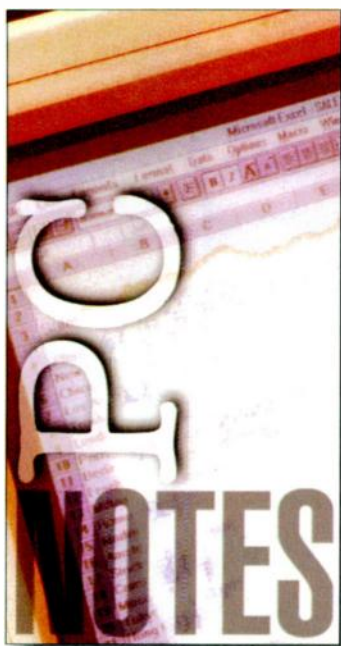
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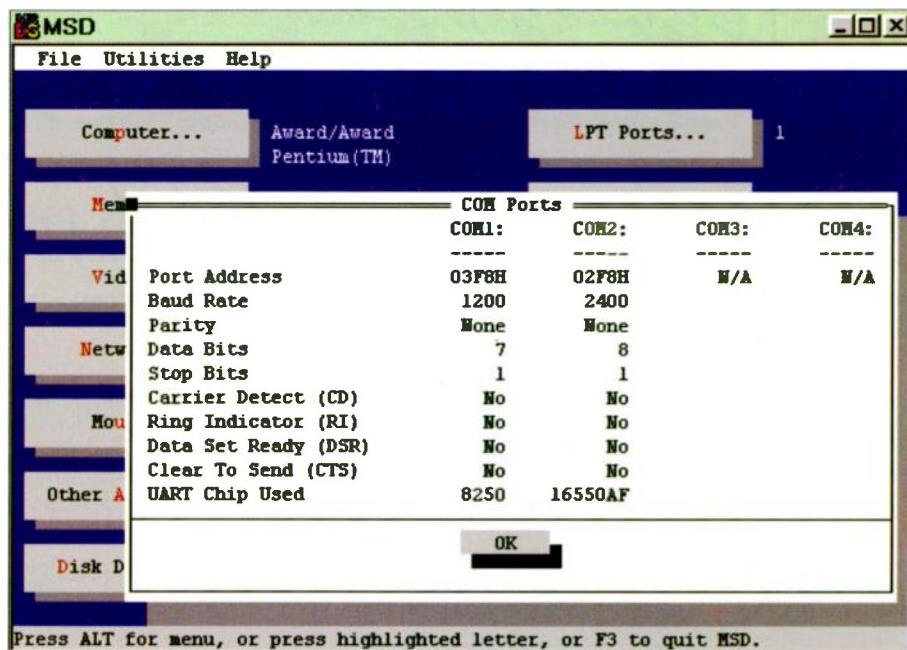
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More and more external devices now plug into the PC serial and parallel ports. MARTIN WALKER explains how to check your settings.

The humble serial port, once solely used for printers and modems, is now the standard way to interface to the Internet, run mice and trackballs, attach some dongles, and even connect to multiple MIDI devices (see the PC MIDI Interface roundup elsewhere in this issue). If you log onto the Internet very often, running your serial port at a less than optimum setting will quickly and unnecessarily increase your phone bills. With serial port MIDI interfaces, using the correct settings may also give you improved reliability, as long as your hardware can support the higher speeds available from Windows 95.

When you're logged on to the Internet, it's the hardware speed of your modem that determines the maximum possible data throughput. In the case of a 14,400-baud device, typical speeds will be up to about 1.4Kb/second (due to extra bits being used for error checking, 10 bits are used to send each 8-bit data byte). However, nearly all modems support hardware compression, which operates much as ZIP files do, in that the data can be compressed at the sending end, and then expanded at the receiving end. For this reason, the setting for your serial port must be higher than the modem speed to take advantage of the compression — you will never achieve the higher speeds unless you tell your software that your serial port is capable of them. Adjusting the COM port speed for Windows 95 can be done from the Control Panel, in the port Properties section of the System Device



You can find out which version of the UART chip your PC has by running the MSD.EXE (MicroSoft Diagnostics) program, which can be found on the Windows 95 CD-ROM. Click on its 'COM Ports' button to show this screen. The 8250 is a slow device, though fine for a mouse, but the 16550A chip features the 16-byte buffer that permits much higher speed serial port operation.

Manager. However, much communications software bypasses this setting, so you should also look for any settings options within the software itself to ensure best results.

Maximum data compression is by a factor of four, so for a 14,400 baud, your software should be set to 57,600 baud, to cope with the maximum possible rate emerging from the modem after decompression. In the case of a 28,800 device, this figure should be 115,200 baud, and so on. There's no point in increasing the software settings beyond these values. For fax modems, much software defaults to 9,600 baud, as this is the maximum speed of most stand-alone office fax machines. Although you can set your rates higher, to communicate with

other fax modems, I have found that I get errors when attempting to receive from a bog-standard fax machine with my Winfax Pro software set at any speed higher than 9,600. Since you don't often know what sort of machine is sending you a fax, it's best to leave it permanently at this setting if you get any problems.

Note that these maximum rates rely on good telephone lines, and data that compresses well. In the case of already zipped files (many large downloadable software upgrades come in this format), it is unlikely that any further compression will be possible, and in this case it will be the modem hardware speed alone that determines download rates. With my ageing 14,400 US Robotics Sportster, I sometimes see occasional bursts at up to 3.7k, especially when receiving large text files such as FAQs, but for long downloads it is more typically around 1.2Kb/second. Another device to put on the upgrade list!

MIDI MAYHEM

Serial MIDI interfaces are becoming more common, with up to eight inputs and eight outputs supported by some devices. A standard MIDI device operates at 31,250 baud, so with eight ports, the data may be arriving at 8 x 31,250, or 250,000 baud. When a byte of data arrives at the serial port, an interrupt is requested, so that Windows 95 can collect the data and deal with it. Most modern PCs use a 16550A UART (Universal Asynchronous Receiver/Transmitter) chip for serial port duty, which incorporates a 16-byte buffer. This may not sound like much, but it can help greatly in ensuring that no bytes are lost while the operating system is responding to the interrupt request. This chip can cope with baud rates of up to 921,600, and so should cope with an 8-in, 8-out serial port MIDI interface with no

THE WINDOWS 95 MIDI LIMIT

While I'm on the subject of multi-port MIDI interfaces (see above), it's worth mentioning that Windows 95 can only cope with a maximum of 11 MIDI devices (11 inputs, or 11 outputs). If you attempt to install more than this number of either inputs or outputs, you will probably start getting GPFs (General Protection Faults). This is not anything to do with the design of the interface; it's just that Microsoft, in their infinite wisdom, decided that 11 devices should be more than enough for anyone. If you have an 8-Out interface, for instance, the driver for this will place eight entries on the Windows 95 MIDI output list. A typical soundcard will probably give two or three more (one for an external MIDI port, one for an onboard daughterboard socket, and maybe one for an FM chip driver). Along with the Microsoft MIDI mapper, this exceeds the total of 11 devices. If you attempt to add a second soundcard, or any other MIDI device, you'll probably be doomed to crashes from the start. The solution is to remove MIDI Mapper or the FM driver. There is some talk that Microsoft will address this limitation in the next release of Windows, but I wouldn't hold my breath.

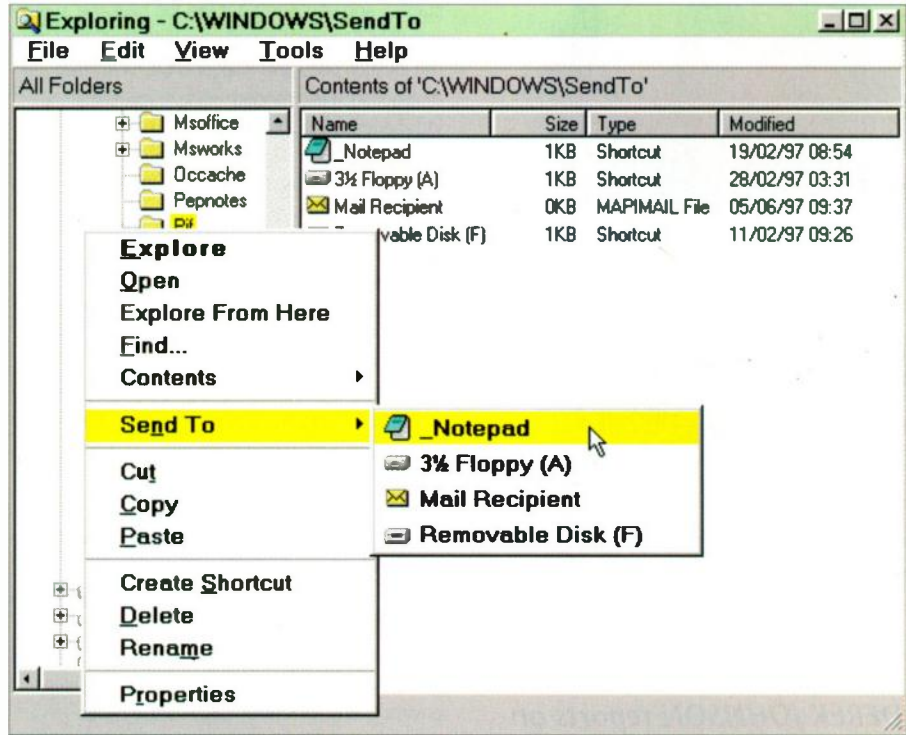
problems. If your PC is still resolutely pre-Pentium, you may still have one of the older 8250 UART chips in it. This may run into problems if you attempt to run even a 1-in/1-out MIDI interface.

In the case of parallel port MIDI interfaces, no speed settings are required, but to operate both MIDI Ins and Outs, you may need to use one of the more advanced bi-directional parallel port modes, rather than the standard one. Most modern PCs have a selection of modes available from within the BIOS, so pay close attention to the installation procedure for your interface, as changing BIOS settings willy-nilly may be potentially damaging to your PC. Interestingly, Steinberg warn, in the FAQ section of their Service Web for Windows (http://www.steinberg.net/support/serviceweb/win/index.html), that fast parallel ports may sometimes cause your Cubase dongle not to be recognised. It would be ironic if setting up your new serial port MIDI interface resulted in Cubase not working!

VIRTUAL CONFUSION

It can be confusing, when trying to set up your PC for optimum hard disk recording, if manufacturers refer to both vcache and virtual memory, as there are two completely different techniques involved here. To speed up the hard drive, Windows 95 uses a portion of RAM to hold data that has recently been accessed from disk: this is known as the Cache. In many applications, there is a high probability that some of this data will be required again shortly afterwards, and retrieving it from RAM instead of re-reading it from the drive can save a considerable amount of time. Read Ahead optimisation is part of the same process, but works by grabbing bigger chunks of data from disk than have actually been requested, on the grounds that the next access is most likely to follow on from the current one. Again, most applications benefit from this, but it can sometimes have a negative effect with hard disk recording, since when grabbing audio data for replay, and recording a new track, the drive may be diving off to different parts of the disk on a continuous basis. In this case, if each grab is larger than actually requested, it can have a slowing effect. For this reason, it's worth trying your PC with Read Ahead optimisation switched off, for comparison.

Adding a vcache entry in SYSTEM.INI (see 'All Tooled Up' in the November '96 issue of SOS for more details) can sometimes improve hard disk recording performance by stopping the cache in RAM from growing beyond a certain size. Otherwise, it's possible that it will grow to a size where the second main cache



Above: By adding an entry for Notepad in the Windows/SendTo menu, you can quickly open any small file for editing, direct from Explorer.



Left: If you've disabled your screen-saver to avoid it cutting in during hard disk recording, with possibly disastrous results, you can still use it on demand by adding an extra entry on the Start menu, or placing a new shortcut on the desktop. Screen-savers have file extensions of .SCR, but can be run just like normal programs. The screen-saver can now be started up by clicking on it, which is ideal if you want to leave your PC for an hour or two, but it will never start of its own accord.

becomes involved — Virtual Memory. This is the opposite side of the coin: when most of the RAM is being used, Windows 95 creates a special file on disk known as the Swap File. Any data that is still needed, but not actually being used at a particular moment, can be shunted off to the disk drive, for later retrieval. This is how you can run many more applications at one time than could ever fit into your RAM memory. The active one will be in RAM, but some of the others are temporarily moved to the hard disk. Virtual

Memory can, if necessary, use the entire remaining area of your disk drive as a Swap File. The benefit of upgrading to a bigger RAM memory size is that less data needs to be shunted off onto the hard drive, so that when you switch between applications, they appear almost instantaneously, rather than causing a frantic whirring of the drive, whilst everything is shunted back into RAM. So, in essence, a Disk Cache (vcache) is RAM acting as a temporary disk drive, whereas Virtual Memory is disk space acting as temporary RAM.

SOS

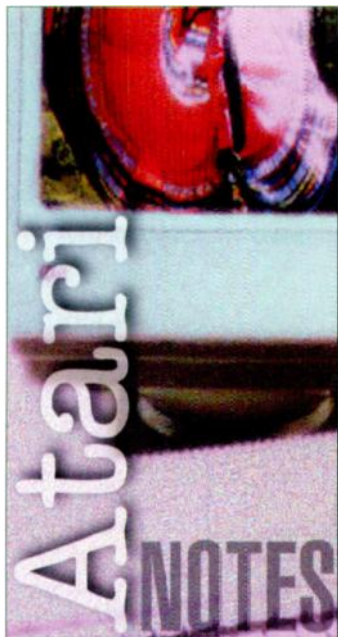
TINY TIPS

Windows 95 can be tweaked till the cows come home, but with so many possibilities it's easy to overlook some of the simpler mods that can still be useful. One that I saw mentioned quite a time ago, but have only just got around to trying, is adding extra destinations to the SendTo menu (one of the many options that pop up when you right-click on a file inside Explorer). You often need to examine the contents of a file

to find out what it contains. Whilst Quickview is extremely useful, it doesn't allow editing (if you don't already have this installed, you can find it in the Add/Remove Programs applet of Control Panel, under the Accessories section of Windows Setup).

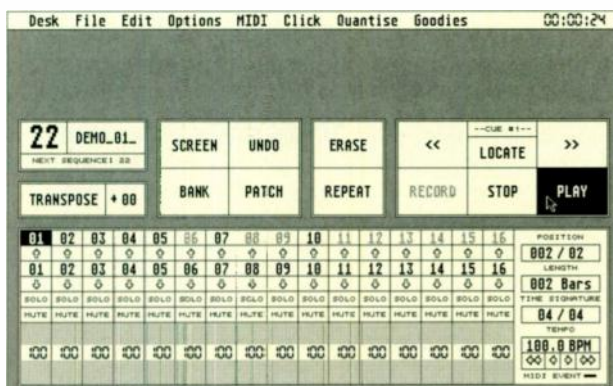
The contents of the SendTo menu can be found in the Windows/SendTo folder. If you create a new shortcut that points to the Notepad (this should be in the Windows directory) a new

SendTo destination will appear on the list, that will quickly open any sort of Windows file and allow you to directly edit it as well. The only limitation is that the file cannot be larger than 64K in size, and, of course, data files will still show up as gibberish. To make things even more streamlined, rename the Notepad SendTo entry, by preceding it with an underscore (shift-minus keys). This will force it to appear at the top of the SendTo list, making it even quicker to select.



DEREK JOHNSON reports on three covetable programs for sequencing and composition, and urges you to share the ware...

This month, I've discovered that two of my favourite sequencers have become rather more accessible. I still regularly use Hollis Research *Trackman* (reviewed by *SOS* back in December 1988, with a preview in November of that year), since it offers a pattern-based approach to song creation that's fast, fun and immediate. Over the years, it's undergone improvements and additions, with the latest version being 2.5. If you want a copy, visit Hollis Research's web site (<http://www.hollis.co.uk>), and download it for nothing. You read that correctly: a 32-track, 32-MIDI-channel sequencer with comprehensive event editing, mixing and synchronisation options for absolutely nothing. Considering that this software was released at £199, that's not a bad saving. The downside is that you can't really expect any support (but the software is very



Hollis Research *Trackman*.

stable), and you don't get the full package, which included a manual, programmable footswitch (for the joystick port) and a second MIDI Out that plugged into the modem socket, for 32 independent MIDI channels (a suitable adaptor can be obtained from Hands On MIDI Software, 01705 783100, or Westec MIDI Market, 01621 788466). Almost everything is available from a keyboard shortcut, so moving around is very quick, and *Trackman* will work on any Atari, from a 520 up, although the more RAM you have, the more MIDI information you can record. All that author John Hollis asks is that you retrieve *Trackman* from his web site, and not distribute it in any other way, so that he can keep track of how many copies are being used. Fair enough, I think.

SIXTEENTH SENSE

Of more recent vintage is Swedish software house Roni Music's *Sweet 16*, reviewed in February 1994's *SOS*. The software has just gone shareware, with registration costing just US\$30 (about £18) if you like and use it. *Sweet 16*, when we reviewed it, offered a *Creator*-like environment for under £50, so the much-enhanced v2.72 is still great value. Again, *Sweet 16* is essentially pattern-based, with



Roni Music's *Sweet 16*.

comprehensive editing facilities, including a piano-roll note editor. One particularly nice feature is that each track within a pattern can have its own length: tracks simply loop until the track with the longest length is finished. You can have a four-beat drum loop, a seven-beat bass riff, and sundry other parts at varying lengths, and *Sweet 16* will be happy to play them all

back accurately. Used to its extreme this gives you what amounts to an algorithmic composition effect. Enhancements since our original review include a General MIDI mixer (with level faders, pan pots, effects sends and bank/patch select controls) and an improved keyboard editor. Like *Trackman*, *Sweet 16* can also address 32 MIDI channels, providing you add a MIDI output expander to your modem port. The software is

easy to use, with the pattern window living side by side with the song list.

Author Rolf Nilsson has ported *Sweet 16* to the PC, and any improvements should be echoed in the ST version — not only does Rolf feel that the Atari's timing is better, but he has "a special feeling for the Atari version... That's where I got started in MIDI programming". The software should be available from the usual PD and shareware channels, and can be downloaded from Roni Music's web site (<http://home1.swipnet.se/~w-11396>).

SERIAL KILLER

Last month, we covered Floppyshop's six-disk PD/shareware music and MIDI software pack. I've since been playing with several of the pack's programs, and one I particularly enjoy is Gareth Jones' *Schoenberg*, a shareware algorithmic serial composition emulator. Basically, you select a 12-event tone row, and a composition is then built from repeated appearances of the row: forwards, backwards, upside down or backwards and upside down. The tone row may appear at any of the 12 pitches within an octave, giving a total of 48 variations, and chords may be formed from more than one note from each row.

Similarly, the software allows you to create rows for note length and velocity, with similar transformations being undertaken. The result can play up to eight separate parts, each of which can be assigned a MIDI channel, program-change number and octave transposition value (parts are played within a single-octave range).

After defining your parameters, press the Compose button, then Play, to hear the finished composition. Instant *Schoenberg*! While the

results are essentially random, producing a spooky emulation of serial music, it is possible to influence them — you don't have to be serial at all, if you don't want to. For example, inputting notes related in some way next to each other (such as the notes of a chord), gives you a better chance of producing something harmonious.

All the action takes place on one screen, so there's no getting lost. The software can also sync external equipment, although the tempo display is slightly eccentric. As it stands, you can save your work, but registering the software (see below), provides a more up-to-date version that allows compositions to be saved as MIDI Files. The author continues to improve *Schoenberg*, and I'll share the new features with you once I've registered! Registration is a measly £5, if you use the software, so do comply. You'll feel good, I promise.

Schoenberg should be available from all good PD/shareware libraries; the Floppyshop pack is priced £8 plus postage (£1.25 UK, £2.25 Europe or £3 ROW). Contact them on 01224 312756 (or email sdelaney@steil.wintermute.co.uk).

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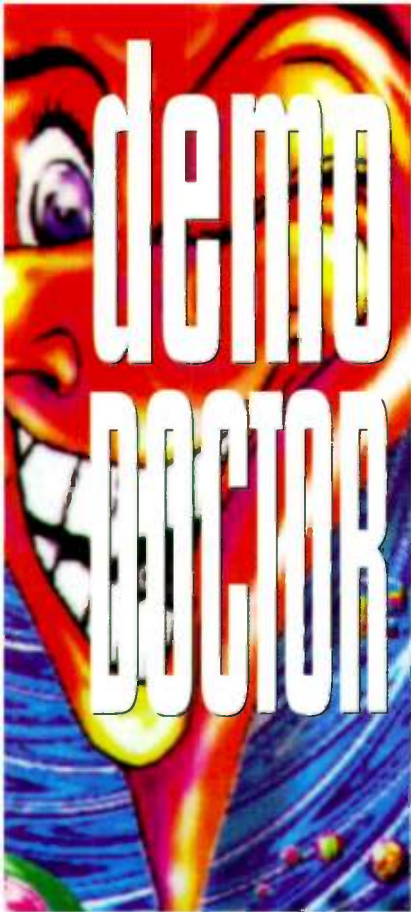
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CATALLUS



Recording Venue: Home and the 'Brill' Building Glasgow.
Recording Equipment (Home): Fostex M80 multitrack recorder, Atari STE running Cubase software, Fostex 450 8:4 mixing desk, Sony DTC690 DAT recorder, Akai AM95 amp, Yamaha NS10 monitors, Kef C-series monitors.

Alasdair Macdonald, who sent this tape, stresses that the tracks are aimed at the commercial side of dance music but would not like to see the production 'watered down' should a record company pick them up.

The first track is funky in that late-'70s kind of way, relying on the kind of chord pattern that would originally have been played on a Hohner Clavinet and replacing it with a chewy synth chord voice. This works well, and the light bass line with touches of resonant filter on the higher notes is solid and warm. The only concession to the '90s is really the drum part — a hard four-on-the-floor and off-beat hi-hat pattern. The hi-hats themselves lack any real treble content

and some shelving high-frequency EQ boost would have lent the whole mix some presence.

Although this is obviously a demo, the mix balance is good and the programming solid; but, more than that, the vocalist has turned in a tremendous performance. The untreated voice in the mix really stands out — if anything is going to sell the song, this is. Full marks for finding the right singer for the job!

Recorded in studio down-time, the second track has the benefit of more pro gear and engineering. Immediately, the bass end is fatter and the addition of reverb gives the track a more polished feel. Backing vocals are in a tasty soul style and treated with a short plate-type reverb, which is dropped for the vocal bass break — a nice touch. All the vocals were compiled to an Akai S3200 sampler, but I notice that a good-quality compressor has been used on the vocals, both on the initial recording and the mix. This has undoubtedly helped generate what is a smooth, warm sound from a digital recording. □

THE SAINT VS THE FREE MARKET

Recording Venue: Home.

Recording Equipment: Akai MPC60 Mk1 hardware sequencer, Casio FZ1 sampler, Akai DR4D hard disk recorder, Sony DTC750 DAT, Shure PE86L mic, Alesis Midiverb II, ART Multiverb LT and Yamaha SPX90 effects, Boss RDD10 delay.

The cryptic title of the cassette is not explained by any letter. The demo merely came with an equipment list — I guess I'll

have to let the music do the talking!

Basically, the first track is some well-recorded dub with samples of a speech by Arthur Scargill, about re-nationalisation and *laissez faire* economics. One of the great things about recording dub is that you can

really quite basic and repetitive and play with lots of effects. Echo and long reverb are, of course, obligatory, but 'The Saint' also brings in some unexpected touches and flourishes. For example, the bass is at one point sent to a

long reverb in a surprisingly effective way, and my favourite moment is when a reverse reverb is applied to the drums and bass. The decay time has been tailored to be in tempo with the track and this gives an excellent rhythmic rush to the break that I've never heard on a reggae dub track before.

On the more standard effects the mix is peppered with single percussive hits to long reverbs, delays that are sometimes fed back to themselves, and rhythmic use of in-tempo echo. What defines the art of mixing and recording dub is actually choosing when to apply these treatments and to what instruments. The sharpness of a timbale sent to a repeat echo will, for instance, have more impact than a stabbed keyboard. Consequently different instruments come and go on this mix, to broaden its arrangement, and different effects combinations are used — skank keyboard and guitar work really well when a delay or feedback loop is created and allowed to build up, then cut before it gets out of hand.

Given the modern ear for



sub-bass frequencies, the bass line could have been a bit more weighty but was suitably lacking in frequencies above 500Hz!

Moving on to the second track, the vocal is treated with a standard short delay falling on the quarter beats, occasionally supplemented by a triplet delay, which is also used on other instruments in the mix. However, one of the best moments is when the drums are fed to a heavy, gated reverb and the echo on the vocal is building up to feedback in a tense way — only for all effects to be suddenly cut to reveal a dry mix. Triplet echo on the vocal then takes you back to the standard beat — as fine a piece of dub mixing as I've heard. □

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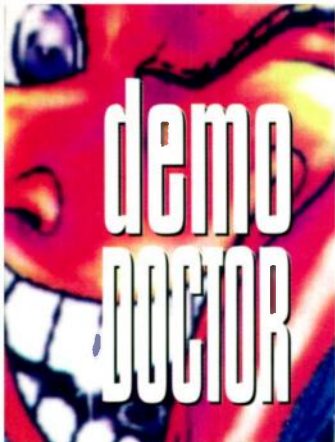
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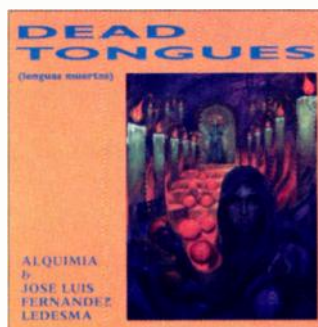
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► **DEAD TONGUES:** This is a CD of contemporary and experimental Mexican music featuring musicians José Luis Fernández Ledesma and Alquimia, who also adds the vocal touches. The music grew out of long improvisational sessions and moves from ambient to movie-score with ease. The recording is



accomplished, and it's good to hear a mix of sequences and played instruments on some of the pieces. The second track is a fine example of a musical collage based around a repetitive pizzicato cello pattern, involving sax, piano,

QUICKIES

and choral voices and extracts from other compositions in a slow-building crescendo. The other pieces are more minimal, electro-acoustic-style productions. The lack of any recording information kept this one out of the longer review section, but this varied and interesting album is available from R and R Megacorp records in Thornton Heath.

SIMON WATERHOUSE

provides us with three instrumental dance tracks which suffer slightly from a lack of presence. This is possibly the fault of the cassette copy, because it seems that he's recorded direct to cassette — so the (mostly digital) sound sources should have provided a clear, clean sound. If it's not the cassette, then I recommend a visit to a studio for a touch of post-production.

Something like a Sonic Maximizer or an SPL Vitalizer should do the trick on the top end, and a touch of quality compression would handle some of the synth peaks that occasionally jump out of the mix.

CJ SCHULER reports that he is a well-known singer-songwriter in the acoustic clubs of London's West End. The tape proves that he can indeed combine bittersweet cabaret jazz with witty lyrics that range from unsentimental jazz to sharp satire. His deep voice and Spanish guitar are embellished by keyboards and samples. Some of these don't really hit the mark, such as the acoustic bass sample on the opening track, which is mixed too high and betrays its sample origins as a result — a real bass player would have been so much more cool. However, the electric and acoustic guitar and percussion add a lot. The dirty slide guitar of the second song is admirably in keeping with the Tom Waits growled vocal. Given the fairly basic recording setup, especially in the microphone department, the vocals sound very good indeed — evidence that if you've got a voice as rich in harmonic content as this, you don't necessarily need an expensive microphone. I do notice that a Drawmer 1960 is listed, though, and such an expensive piece of valve gear has surely contributed to the warmth and

control of the vocal in the mix. **PHILIP JAMES'** recorded compositions have a very interesting mix of Eastern and '60s-sounding Western influences that make him sound almost like a modern Donovan. I guess it's the vocal sound that helps create this feel too: light and ever so slightly nasal — I like it, it suits the Eastern theme very well. The recording



itself has been well realised by engineer and musician Carl at the studio in Bradford

where Philip records. Possibly the material is too far from the dance world and too close to its ethnic background to appeal to record companies: I'd suggest some re-programming of beats and bass lines, retaining the vocal takes if the tape and synchronisation code are still in place.

GERRET PARNHAM: Neil Gerret and Michael Parnham have collaborated for this recording, which is loosely rock-based with pop leanings, probably what people used to call dance rock in the '80s. The vocal stands out as needing attention because the sound lacks any presence. This is surprising, as an electret mic was used for the recording, so I can only conjecture that the treble has been cut a little on the opening track for some reason. As the guitars are trebly enough, I can't really blame it on the quality of the cassette this time. I notice that the vocals are all double-tracked, which is unnecessary, as Michael Parnham has a fine voice, and this could lead to some muddying of the sound. Also, extensive use of effects with modulation in them tends to make sounds lose presence. Finally, the voice really does need compressing because the level moves up and down considerably within the track, from the audible to the inaudible. Otherwise, a well-performed offering which lacks some definition in the bass end. ◀

DEVRIES AND GENTRY

Recording Venue: Home

Recording Equipment: Fostex R8 multitrack and 812 mixer, Mackie 1202 mixer, Boss SE70 effects, Atari 1040 STE running Cubase software, Phillips DCC730 recorder, Aiwa tape deck, AKG C1000S mic, Realistic 100W amp, Sony speakers.

Devries and Gentry are aiming to interest other artists in their material, although the demo is also for their own satisfaction. Clive Devries himself describes the songs as MOR and is really aiming the songs at the 35+ age group. He also asks how to get the songs heard by artists. There are a few routes, all of them quite difficult. You first have to target your artists, then find out who their record company, publishers and management are, get some names and send stuff specifically to them. Blagging your way in to see someone on the phone is harder work but still possible, and more productive.

The material here is lightweight but well constructed in the classic song-arrangement style, using instrumental breaks, standard verses, and choruses. Some of the arrangements could be tightened up: for example, the instrumental reprise after the first and second choruses could be half the length, to move the song onward and give it pace. A middle eight could have been added (a classic move to the relative minor, in this case an E minor from G major).

Another improvement to the verses could have been to introduce another instrument, an occasional harmony vocal, or both, as they build up. Simply repeating the same thing with different lyrics is rather static.

On the second song, a dub bass line would have been a better than the rather busy bass guitar sample line. This would not necessarily have reduced the song's commercial possibilities if it had been tailored in the same way as, say, UB40 might have done it. Another suggestion would be to use a four-on-the-floor bass drum, which also would have made the song sound more commercial in an up-to-date way. The more complex patterns that are currently being played by the bass drum could then be taken on by percussion without losing the rhythmic feel of the original completely.

The songs are fairly relaxed and the vocal delivery suits the material, although the tendency to double-track and heavily treat the voice with processing betrays a lack of confidence. Some more inventive use of reverb and echo would have helped not only the vocals but other instruments too. For example, the last track features synthesized brass stabs which are left high and dry and are a little limp as a result. A touch of room reverb would soon have brought them to life. ◀

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ROLAND JUNO 60, JSQ60 sequencer, flightcased, £340 ono, Boss DR660 drum machine, £220 ono; Pison series 3A, 2Mb with 4Mb flash ROM, leather case, psu, £350 ono, excellent condition. \Rightarrow John 01964 624067

ROLAND JV50, fully expanded, excellent condition, superb synth with great sounds, £450, Fostex 3805 4-track recorder, 12 inputs, Dolby S, barely used, All boxed with manuals, £500. \Rightarrow 0181 9971146

ROLAND JX8P, £250; Korg M1, £450, both with manuals and flightcases, Alessis Micro Limiter, £25, Ultimate Deltex keyboard stand and carry bag, £25. \Rightarrow Tony 01206 735953

ROLAND JX8P, needs attention, hence £200, Boss CE28 bass chorus pedal, GE-78 bass equalizer pedal, £35 each ono, £65 Pair, Aless Microverb 2, £65. \Rightarrow Chris 0421 507144

ROLAND JXIP, excellent condition, £395, Roland MC500 Performance package (MRP500), offers; Yamaha R1000 Reverb, £65; Laney linebaker 65 bass amp, £175. \Rightarrow Chris 01793 495551

ROLAND MGS64 EXPANDER as new, boxed, manuals, £350; Art Multiverb Alpha, £100; Charlie Lab Digital, £50. \Rightarrow 01375 673411 Essex

ROLAND SUPER JX module, excellent condition, £395; Casio VZ8M digital module, £50; Peavey MIDI Master MIDI patchbay, £50. \Rightarrow 01332 544084 (Derby)

ROLAND SUPER JX10, mint, £500 or would part exchange for analogue, Minimoog, vocoder, etc. \Rightarrow Mark 01952 273862

ROLAND U20 keyboard, excellent condition, £275; Yamaha TX16W stereo sampler, 1.5Mb, 10 outputs, resonant filters, includes Typhoon software and disks, VGC, £440. \Rightarrow Martin 01244 376446

ROLAND U20 synthesizer with extra Atari soundbanks and editor, £330; 2x M2566 RAM cards with U20 patches, £45 or the lot for £360. \Rightarrow 01933 678608

ROLAND XP50, good condition, quick sale, hence £750. \Rightarrow Jon 0121 523 7727

ROLAND XP50, five months old, parts and labour guarantee until Jan 1998, boxed & manuals and receipts, used for one month, mint, £795 ono. \Rightarrow Steve 01978 361392

ROLAND XP50, brand new, boxed with manuals and disks, will come with hard case and stand, unwanted gift, quick sale, £950 ono. \Rightarrow Ian 0114 243 2910

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YAMAHA CSIX Control Synth, fantastic sounds, hands-on control, £425 ono, very versatile tool. Wanted Cubase for PC, must be unregistered. \Rightarrow Paul 01732 455790 or 0410 077759

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AKAI MPC3000 sampling drum machine, sequencer, SMPTE option, video option, expanded memory, boxed, as new, £1650; Akai S2800 internal 80MB hard drive, expanded memory, VGC, £950. \Rightarrow 01224 715354

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ATARI MEGA2 + SM124 monitor + Naksha Mouse, £265; Cubase V3 + dongle, £245 \Rightarrow Malcolm 0191 565 4334

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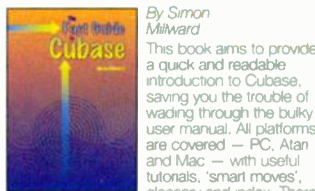
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by Donald S. Passman
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Written & compiled by Anne Gunning
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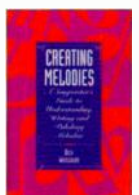
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By Rob Young
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MUSIC TECHNOLOGY REFERENCE BOOK

by Peter Buick & Vic Lennard
Written by Peter Buick and Vic Lennard (author of SOS's Alan 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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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.

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A BEGINNERS GUIDE TO MIDI

by RA Penfold
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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.

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by Peter Forrest
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by Julian Colbeck
The latest instalment in the intrepid Keyfax series offers potted specifications and concise mini overviews of digital pianos, home keyboards, General MIDI modules, stage organs and computer sound cards. Look out for company backgrounders, contact details and cross-references to earlier Keyfaxes.

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by J Dreksler & Q Harle
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COMPUTER & MUSIC

THE DESKTOP MUSCIAN

By David M Rubin
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.

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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.

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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.

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LIVE SOUND

LIVE SOUND

Peter Buick has produced a book written for live sound engineers and gigging musicians with practical applications and real life scenarios very much in mind. The whole ambit of live sound engineering is addressed, including the equipment used and how to get the most out of it, the problems you will confront and how to fix them, and various other related subjects such as safety, feedback, as well as automation and MIDI in the live sound field.

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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.

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SOS Videos

EMAGIC

THE EMAGIC LOGIC TUTORIAL VIDEO

Produced by Emagic themselves, this video once again sees Tim Walter in the tutor's chair. This takes you through the first steps of getting the software up and running and covers virtually all the controls you'll need. This video is valid for all versions of Logic, whether being run on an ST, Mac or PC. Presentation is rather intriguing, with a mobile camera that helps to hold the interest more than the average training video and some interesting graphics that aid comprehension and help to quickly find specific tutorials and bits inside tutorials. Contents as follows:

- Tutorial 1 The Arrange window and basic sequencing
- Tutorial 2 Playback parameters & Toolbox
- Tutorial 3 Controlling MIDI data flow
- Tutorial 4 Manipulating sequence data
- Tutorial 5 Moving around in Logic
- Tutorial 6 Windows and key commands
- Tutorial 7 More sequencing
- Tutorial 8 Score
- Tutorial 9 Looking at the Event List
- Tutorial 10 Editing the Event List
- Tutorial 11 Using the Environment
- Tutorial 12 The best of the rest (HyperEdit, Matrix Editor, Cycle Mode and more)

CODE V023 £29.99
Total running time 70 minutes Format: VHS (PAL)
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

CUBASE

STEINBERG CUBASE

This manual is presented by Chris West, Steinberg expert. It's very much a practical, get up and running video, showing the novice user exactly how to install and begin using Cubase, whether they're running the program on an ST, Mac or PC computer — there's even a basic background on using the computers themselves! All of Cubase's controls are shown, explained and demonstrated in depth. Once you're familiar with the basic controls, Chris takes you slowly through recording your first session, followed by overviews of the various edit screens. It's rather like having an expert tutorial that you can run again and again in the comfort of your home, until you can use Cubase like a true pro. Topics covered include: the main screen, customising names and outputs, copying and pasting between arrangements, MIDI filter, cycle mode recording, the tool box, all edit screens.

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

RECORDING

MACKIE ULTRA MIX VIDEO GUIDE

This highly informative video for the Ultramix automation system clearly demonstrates how to set up and use Ultramix's many time-saving features to get the best from your system. The cost of the video may be redeemed against the purchase price of an Ultramix system, making the video a good way to try before you buy!

CODE V066 £9.99
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MACKIE 8-BUS



VIDEO MANUAL

Almost 60 minutes of fun-packed, detailed explanation of the various features of Mackie's popular range of 8 buss mixing consoles (16•8, 24•8, 32•8, 24•E) and how best to utilise them. Onscreen numbers allow quick searching to desired topics.

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SYNTHESIZERS

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
Run time: 63 minutes
Postage: UK £1.75, Europe £4.95, R.O.W. £6.95

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 heartwarming 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
Run time: 55 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.

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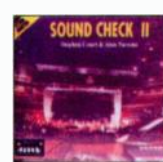
EMAGIC

EMAGIC NOTATOR VIDEO TRAINING MANUAL
CODE V012£19.99

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SOS CDs

SOUND CHECK CD II



Recorded & compiled by Stephen Court & Alan Parsons. Sound Check has become an international reference for producers, musicians and sound designers. The new version features all the test signals and reference recordings (made at Abbey Road Studios) of the original, including pink noise bands, 1/3rd octave bands, sine and square wave spot frequencies, sweep tones and SMPTE timecode utility tracks plus some new operatic vocal and music items, to a total of 99 tracks. The major innovation offered by Sound Check II is that it is available in a special package that features a built in mic and spectrum analyser for use with the CD's 1/3rd octave tracks. The package is thus a compact and convenient method of measuring frequency response whenever and wherever you may need to.

CODE CD038 £28.99
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CODE CD038S £73.50
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SYNTHESIZER TECHNOLOGY ASTRAL AMBIENCE CD

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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 £7.95
CD CODE GD037 £10.95
Postage: UK £1.50, Europe £3.95, R.O.W. £5.50

HOW TO GET THE MOST OUT OF HOME RECORDING

3 TOP CLASS VIDEOS

A superbly presented set of videos which no home recordist should be without. Have you got your set yet?!

LEVEL ONE

This well presented video explains how to set up and operate a simple cassette-based multitrack home studio. It clarifies all the basic terminology and demonstrates the recording of a song from beginning to end, covering how to record guitars, keyboards, vocals and drum machines; which microphones to choose; how to 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 Milton MacDonald and an enlightening interview with ace producer Alan Parsons. Writer/presenter Julian Cobbe 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 Martyn Phillips (Erasure, 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
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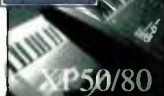


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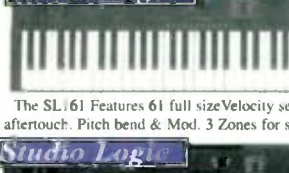
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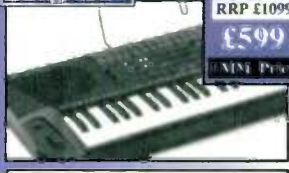
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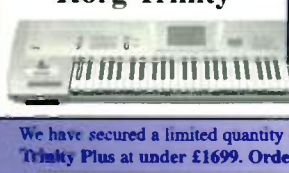
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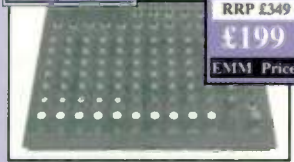
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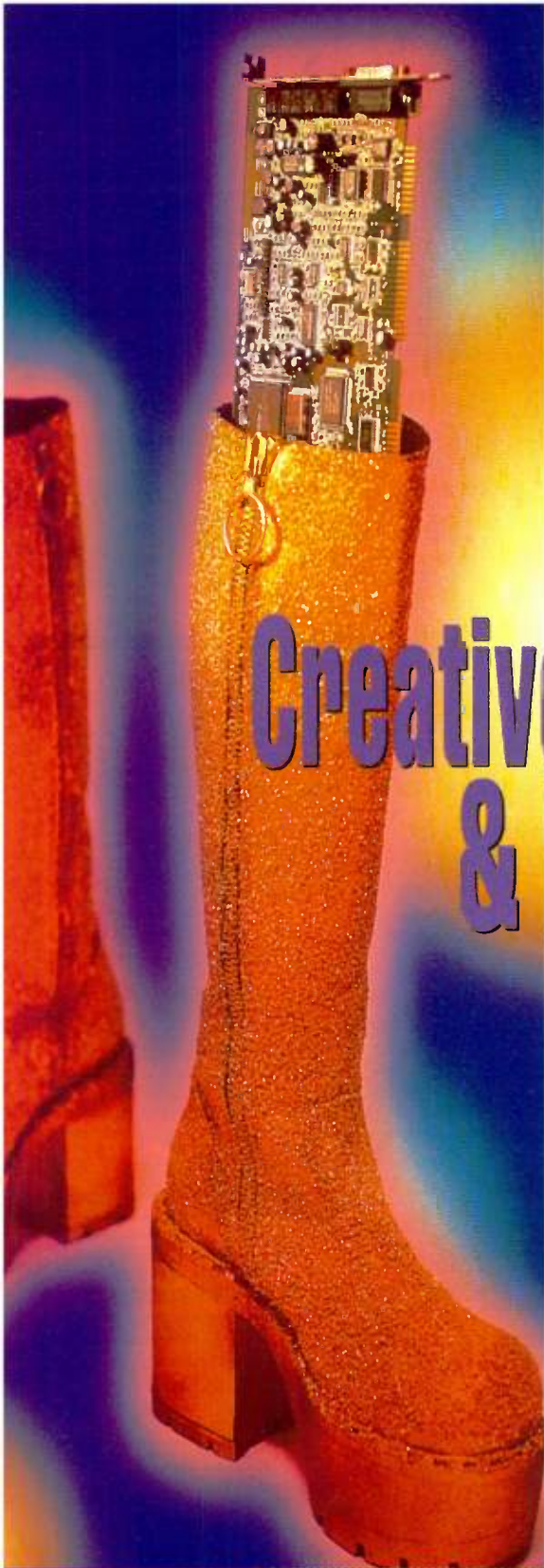
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Creative Labs was founded almost 15 years ago in Singapore, and created the now-ubiquitous SoundBlaster standard for PC soundcards. But the company haven't stood still, constantly redeveloping and redefining their range. Their latest flagship card is the £199 AWE64 Gold (reviewed in SOS July 1997), named for its gold-plated connectors. Though still compatible with the SoundBlaster standard, the 16-bit Gold has been upgraded in several areas, giving it lots of appeal to the desktop musician. Features include:

- Total polyphony of 64 notes
- A built-in GM/GS synth.
- An Emu 8000 wavetable synthesis chip
- 4Mb of on-board memory (which can be upgraded to 8 or 12Mb)
- Stereo ins and outs with additional S/PDIF digital output.
- MIDI interface.
- Sampler based around Creative's own SoundFont technology.

Creative Labs AWE64 Gold & Value PC Soundcards

- Bundled support software, including Steinberg's *Cubasis* sequencer and a sample editor, on CD-ROM.

As *SOS* editor Paul White said in his review, "Where else could you buy a sampler, a GM synth, a MIDI interface, an audio interface (with S/PDIF out), a Steinberg sequencer, support software and a selection of CD-ROM samples for under £200?" Two *SOS* readers can win one of these great cards in this month's competition, and Creative have also kindly donated two £80 AWE64 Value cards as runner-up prizes. The Value card offers some of the same features as the Gold, including 64-note polyphony, Emu synthesis chip, SoundFont technology, and bundled support software. As ever, there's a ludicrously simple set of questions to answer and a tie-breaker to complete in an appropriate and/or amusing fashion, if you want to be in with a chance of winning one of these great prizes. Your completed entry should be with us by the closing date of: **Friday September 5th, 1997.**

Prize kindly donated
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the small print

1. Only one entry per person is permitted. 2. Employees of SOS Publications Ltd, Creative Labs, 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.

QUESTIONS

1. Creative Labs proprietary sample library technology is called:

- a. FoundSounds
 b. SoundFonts
 c. NoiseFonts

2. Creative Labs was founded in:

- a. Singapore
 b. Shanghai
 c. Grunty Fen

3. Why is the AWE64 Gold so named?

- a. Because you have to earn over £20,000 a year to get one
 b. Because it's yellow
 c. Because it has gold-plated connectors

4. The AWE64's synthesis chip is made by:

- a. Penguin
 b. Emu
 c. Ostrich

Post your entry to: SOS Creative Labs Competition,
Sound On Sound, Media House, Trafalgar Way,
Bar Hill, Cambridge CB3 8SQ.

TIE-BREAKER

What's worth its weight in gold? (Be Creative, in less than 30 words please.)

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564

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of the complete song elsewhere on the same MiniDisc. This 'Bounce Forward' feature makes the 564 truly powerful, allowing you to build up a 12-track recording without leaving the confines of the 564. Naturally, the sound quality of the MD system is streets ahead of any analogue cassette multitracker.

Other welcome features include: sweepable Mid EQ (250Hz - 5kHz); two auxiliary sends; versatile automatic punch-in system allowing up to five takes to be recorded for later comparison; trimming and naming of index marks so that each section of a song can be identified accurately, with completely non-destructive copy and move functions. MIDI-wise, the 564 allows full tempo-map editing, with up to 32 signature changes per song! It also understands MIDI Machine Control for fully remote operation.

In his December 96 review, *SOS* author Hugh Robjohns described the 564 as "the Portastudio for the '90s, with some very clever features and facilities. The leading machine in the MD format at present. Easy to integrate into a MIDI setup and works well as a MTC system controller. Excellent sound quality with superb editing facilities, safe overdubbing mode and convenient format." What more need we say? To enter, all you have to do is subscribe (or renew) to *Sound On Sound*, answer the tie-breaker question, fill in the form below and return it by the closing date of 30 September 1997.

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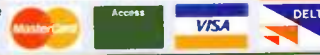


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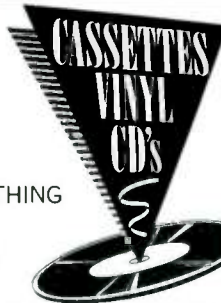
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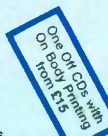
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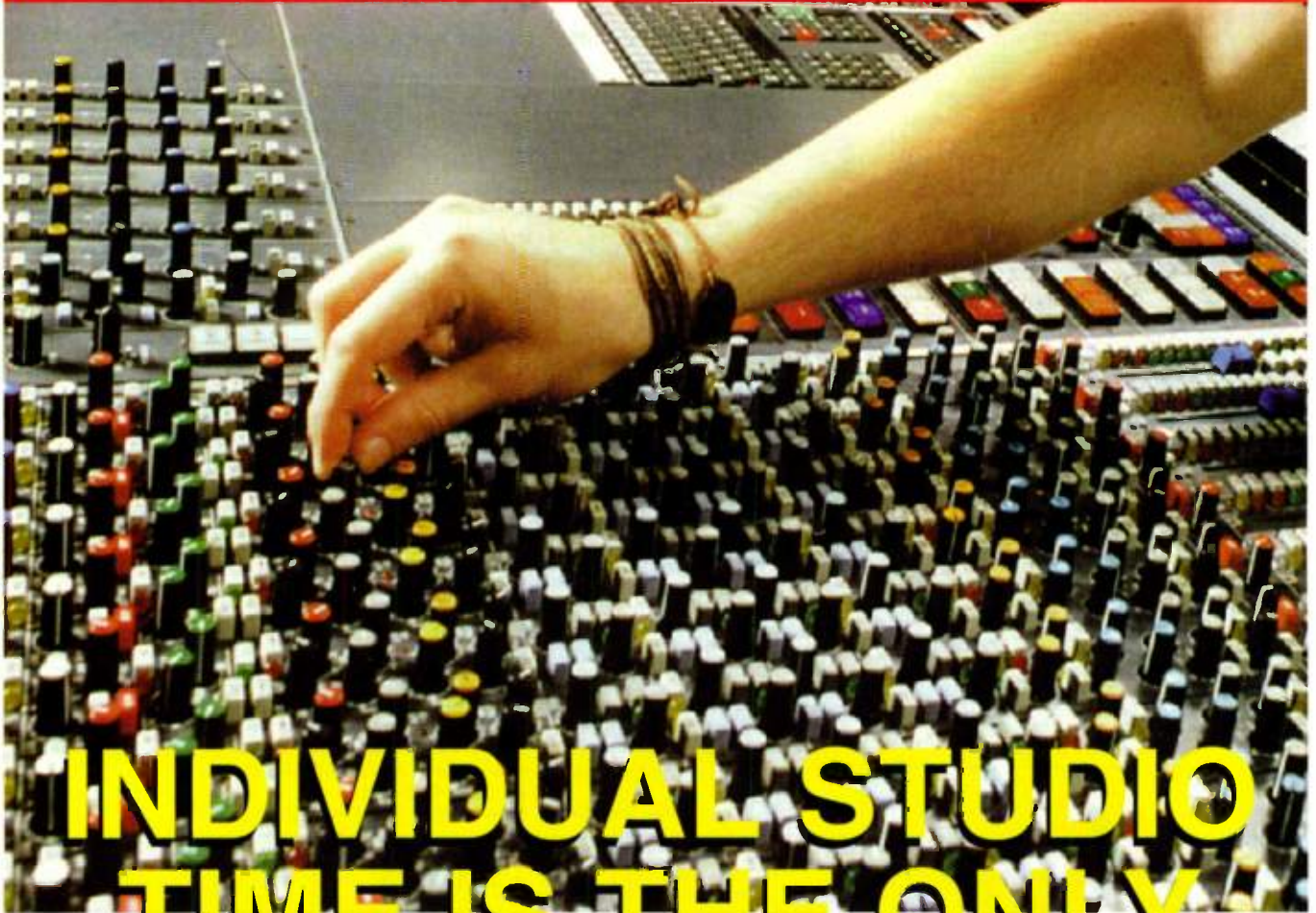
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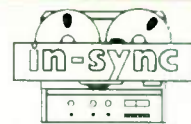
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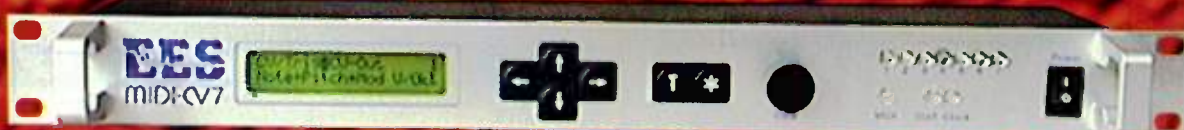
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Sounding Off

**Youth of today
MARTIN RYAN puts the
case for the defence of
modern music — and
argues that judgement
should be reserved for
the time being.**

Whether it's a whinge about the latest batch of dance-orientated synths or a complaint about the state of music today, the average Sounding Off could be summed up with the phrase "things ain't as good as they used to be." What I intend to do in this article is provide the case for the defence.

According to Steven Robinson (SOS July '96) pop music died some time in the mid '70s, and the youth of today (myself included) have put up with "a monstrous amount of garbage passed off as music". The modern music scene is "sadly lacking" in real talent, consumed by a "brainwashed" public who apparently have no concept of what they like or dislike. A whole generation has grown up accepting whatever the marketing moguls of the record companies choose to throw at them. This assessment strikes me as just a little unfair.

The question of what constitutes talent is one that I really can't answer. I guess we all like to believe that the music we listen to is produced by talented people. Personally I find modern musicians such as Liam Howlett or Robert Miles every bit as talented as Lennon or McCartney.

They have all pushed back the musical boundaries in some way, and to argue that one genre is superior to another is a dangerous game. For Mr Robinson, the '60s and '70s produced classic songs that are still remembered several decades later. However, for every song that becomes a classic, hundreds do not and are forgotten. Just as there is (in my opinion) some absolute dross in today's charts, so there was some absolute dross in the charts of the '60s and '70s. Does anyone remember the Piltown Men? Or The Merseybeats? And it wasn't my generation who got Rolf Harris' 'Two Little Boys' to number one. Mr Robinson is also on safe ground to talk about '60s and '70s covers, using them to argue his case that those songs were much better than the songs of today. Obviously, though, it's not likely that we'll start seeing covers of such '90s songs as 'Don't look back in anger' for a good few years — not because they're no good, but because it's not yet time for them to be revisited.

Mr Robinson's diatribe against modern marketing methods is easier to attack. I agree that music today is heavily marketed and that image plays a part in the success of pop stars, but things have always been this way. Would Elvis have become such a phenomenon if he had been

short, fat and devoid of sex appeal? Was the popularity of The Beatles due solely to their music? Even if marketing of pop music were a modern invention, this would not mean that consumers were incapable of making their own decisions. Consider one of the most marketed bands in recent history — Babylon Zoo. Their single, 'Spaceman', made number one on the strength of the Levi ads, and when people realised that they weren't some futuristic techno band, Babylon Zoo soon vanished from sight.

But it is not just the music that has come in for criticism in *Sound On Sound*: technology has taken a battering too. How often are we told that modern technology stifles creativity, that MIDI creates dull, sterile music, or even that using a sequencer is no substitute for learning to play a 'real' instrument (whatever that may be). Technology is a tool — nothing more, nothing less. If a person's music is dull and sterile it is not the fault of the equipment but the fault of the musician. A sequencer can record only what you play into it.

Technology cannot be blamed for a lack of innovation. Synth modules aimed at the dance market, such as Emu's Orbit, have been attacked for providing yet more of the same old dancey sounds, with no thought for experimentation. What seems to have been forgotten is that dance music is a style like any other style; it has certain characteristics and instrumentation, but these do not preclude experimentation. Would it be decided that a jazz band could not be experimental simply because it used a clarinet and a double-bass, or that there is a fundamental problem with rock music because it always uses electric guitars? It's not the sounds that determine whether a piece of music is innovative but the ways in which those sounds are used. If dance music seems to be rigid and, to a certain extent, predictable, this is simply because that's what people want in a club. The 909s and 303s are used so often because they work, they get people dancing. Their seemingly ubiquitous presence is not a fault of dance music. It's the musicians, not the technology, who are important. Drum loops had been used before Goldie's 'Timeless', but he almost single-handedly created a new form of music. Similarly, pianos had been used in house music long before Robert Miles' track 'Children', but it was still ground-breaking.

If there's any message to be found in this article, it's best summed up by Pink Floyd: "Leave those kids alone". The music scene today is different from what it was in the '60s because the world is a different place. The music of today is no better or worse than that which has come before it — it is simply different. Modern technology does not mean that music need be restricted or stifled; it does not make music good or bad — the musician does that. Sure, I produce utter rubbish using *Cubase*, but then you haven't heard my guitar playing!



If you'd like to air your views in this column, please send your ideas to: *Sounding Off*, *Sound On Sound*, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ. Any comments on the contents of previous columns are also welcome, and should be sent to the Editor at the same address.

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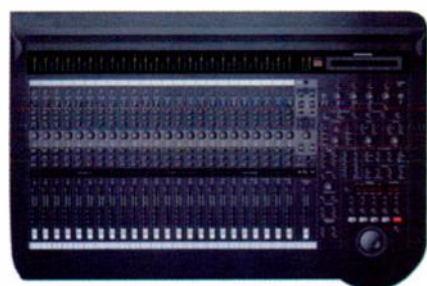
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EMU ESI-32 + SCSI

- 32 note polyphony
- G chip filters

£899inc VAT

EMU E4x

- FX processing
- Expandable to 128Mb
- 540Mb HD with sounds
- 4Mb RAM
- 64 voice

£2699inc VAT

Roland MS1

- 16bit
- 4 Voice

£325inc VAT

JoMox XBase 09

- Midi drum machine
- "808" clone

£699inc VAT

Yamaha A3000

- 64-note polyphony
- Expandable to 128Mb
- Three multi fx banks
- 16 part multitimbrality
- Four band parametric
- 128 programs

£1299inc VAT

EMU Carnival

- Latin module
- 16 part multitimbral
- 640 presets

£749inc VAT

EMU Planet Phat

- Hip-hop/acid module
- 640 presets

£749inc VAT

Roland JV1080

- 4 expansion slots
- 64 note polyphony

£899inc VAT

Novation Super Bass Station

- Two oscillators
- Sub oscillators

£449inc VAT

Roland JV2080

- Eight expansion slots
- Three FX processors
- Large screen

£1299inc VAT

HARD DISK RECORDING

Akai DR8

- 8 track
- Inc 2Gb drive

£2999inc VAT

Akai DR16

- 16 track
- Inc 2Gb drive

£4199inc VAT

Fostex DMT8-VL

- Studio condenser
- Something else

£949inc VAT

Roland VS880PVX

- Inc 1.4Gb drive
- Plus FX board

£2099inc VAT

Fostex D90

- Eight track non-compressed
- 18/20bit converters
- Chase mode

£1499inc VAT

MUSIC LAB Sales & Hire

Ordering Information

Business Hours Our showrooms are open from 9.30am - 6.00pm Monday to Friday. We are pleased to accept orders in person, by phone or in writing. Goods may be collected or delivered any where in the world, subject to quotation for shipping.

Payment Methods We accept cash, credit cards, building society cheques, personal cheques (subject to clearance) and UK government orders for immediate collection or despatch. Bank transfers from all UK and foreign clients accepted. Details available on request. All orders shipped on confirmation of cleared funds. Please allow seven working days for clearance of cheques not covered by guarantee card, or ask about Transax clearance.

Overnight Nationwide delivery Fully paid mail orders and credit card sales are normally shipped same day for delivery next working day. All Orders are carefully packed and insured for loss or damage in transit.

Export Delivery Music Lab supplies equipment to Europe and worldwide via UPS Express Service. Guaranteed next morning delivery to major European cities and other international centres.

After sales support Music Lab has many years of practical experience in maintaining and supporting professional audio equipment. All new products and equipment supplied carry a full one year guarantee covering parts and labour. This in no way effects your statutory rights.



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Backline Clear Out

We are clearing out some of our backline and instrument hire stock to make space for lots of new digital gear. If you are interested in anything listed, make us an offer.

Ampeg B15 Bass Combo	£Call	Marshall 2203	£Call
Ampeg SVT2 Amp	£Call	Marshall 5002	£Call
Ampeg SVT810E Cab	£Call	Musician Stingray	£Call
Fender Jaz Bass	£Call	Rhodes MK80	£Call
Fender Precision	£Call	Rickenbacker 360/12 V64	£Call
Fender Telecaster	£Call	Roland D50	£Call
Fender Twin Reverb	£Call	Roland JC120	£Call
Fender Vibroverb	£Call	Roland JD800	£Call
Gallien Kruger ML120	£Call	Roland Keyboard Cube	£Call
Gibson J200	£Call	Roland SBX80	£Call
Gibson Les Paul Custom	£Call	Takamine CP132S	£Call
Gretsch Country Gent	£Call	Takamine EN10	£Call
Hohner D6	£Call	Trace Elliot 1210H	£Call
Marshall 1960A	£Call	VOX AC30	£Call
Marshall 1960M	£Call	VOX Continental	£Call
Marshall JCM900	£Call	Washburn AE30	£Call
Marshall Blues Breaker	£Call	Wurlitzer EP200A	£Call
Marshall JTM45	£Call	Yamaha KX5	£Call
Marshall 2100	£Call	Yamaha KX88	£Call

Special offers on equipment hire



DA88 £65 per day ex VAT **T/CDAT £75 per day ex VAT** **DATs from £25 per day ex VAT** **ADAT XT £50 per day ex VAT**

This is just a tiny proportion of the Music Lab hire stock, please call for a competitive quote on almost any audio item

Used & Ex Hire

Audio & Design F760XRS	£500
AKG Tube Valve Mic	£1299
Alesis ADAT Sys4	£1200
Alesis ADAT XT	£1950
Alesis Monitor 1	£230
Alesis S4 Module	£300
Amcron PC160	£195
Aphex Tubessence	£395
Aphex C2	£200
Aphex Type 3	£550
AR18LS Monitors	£400
BBE 822	£300
BRC Ex-Demo	£999
BSS DPR502	£599
Behringer Multifex	£150
Beyer DT100	£89
Bose 802 PA Speakers	£1150
B&K 4007	£795
BSS AR116 DI Box	£75
BSS DPR402	£675
CAudio 2001 Amp	£750
DBX 902 Module	£250
Dolby SR Rack	£Call
Digidesign Pro Tools Nu Bus	£Call
Denon DRM710	£175
Emu Proteus FX	£250
H/K LS200 Speakers	£75
Klark Teknik DN716	£675
KRK6000 monitors	£475
Lexicon LXP1	£250
Mackie CR1604	£549
Masenberg 8200	£2750
MXR 126 Flanger/Doubler	£450
Neve 33609	£1895
Orban 622B	£750
Pultec HLF3	£450
Rane RA27 Analyser	£275
Revox C274 4 Track	£1150
Roland MDC1	£399
Roland MS1 Sampler	£290
Roland MT32 Module	£150
Roland TR707	£150
Roland TR505	£100
Roland TR727	£150
Roland U220 Module	£300
Sanken CU41	£950
Sennheiser H/Held System	£500
Sennheiser Lapel System	£500
Shure H/Held BETA 58	£550
Sony DTC60es DAT	£550
Sony DTC690 DAT	£400
Soundcraft DMIX 8Ch	£1300
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Soundcraft 200BVE	£1500
Soundcraft Live 24	£1450
SSL FX384	£1750
S/tracs Solo Midi24	£1900
TAC Bullet 10/4/2	£1200
Tannoy NFM8	£300
Tannoy PBM6.5	£200
Tascam DA88+ Sy68	£3450
Teletonix LA2A	£2800
Topaz Meterbridge	£450
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Yamaha EMP700	£350
Yamaha REV7	£600

Prices include VAT and are not subject to 10% discount



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- Emagic Audiowerk8
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- Gateway P166 MMX
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- 15" Monitor
- 32 Mb RAM
- MOTU Micro Express
- Fully Commissioned

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Audiowerk8 & Apple 7300/166 Package



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- Emagic Logic Audio
- Apple 7300CD 166
- 2Gb Rorke Data HD
- 17" Apple Monitor
- 32 Mb RAM
- MOTU Micro Express
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Fostex D-160 16 track Hard Disk recorder



- 16 track digital multitrack
- ADAT digital interface
- 2.55Gb HD fitted
- 44.1kHz and 48kHz
- SCSI-2 for back up
- MIDI clock
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D160 £2931 inc vat

Inside: More HD packages and more special offers.
Plus: See back cover for latest used and ex-demo and backline lists

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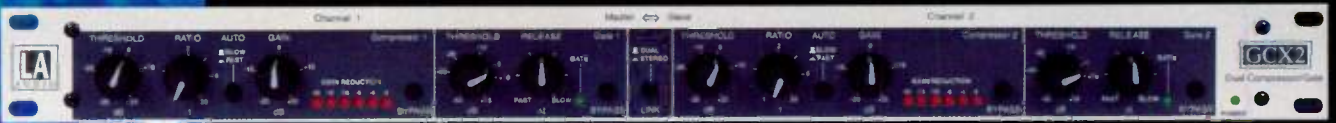
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- The MPX1 is a single channel Multi Processor combining Preamplifier, Expander noise reduction, four mode Auto Compressor with De-Ess function and comprehensive Equaliser. The MPX1 is an ideal front end for computer based recording/editing systems, or any application requiring critical control over signal path.

LA AUDIO MPX1
RRP £299 inc VAT



- The GCX2 is a powerful dual channel combination of high performance dual mode Auto Compressors and fast acting Noise Gates. The GCX2 may be linked for stereo operation and is ideal for all compressor applications while the addition of Noise Gates is great for noise reduction or eliminating overspill.

LA AUDIO GCX2
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LA AUDIO MLX2
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- The EQX2 is dual 3 band Parametric EQ which can also be switched for single 6 band applications. The EQX2 adds timbre to vocal and solo instrument recording, while in a PA rack the variable 'Q' on each band gives a high degree of control over feedback and other equalisation problems.

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