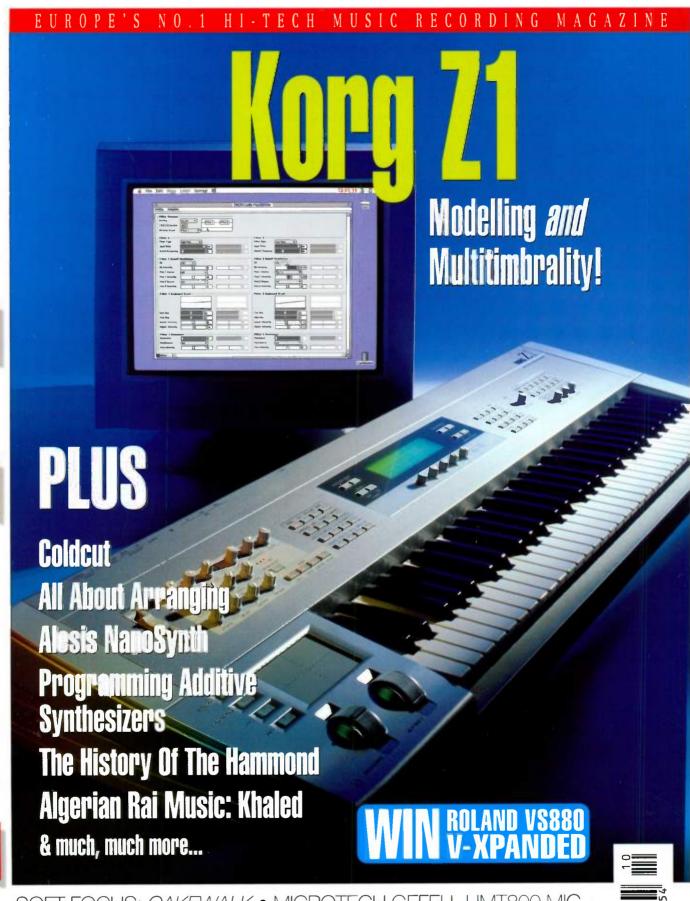
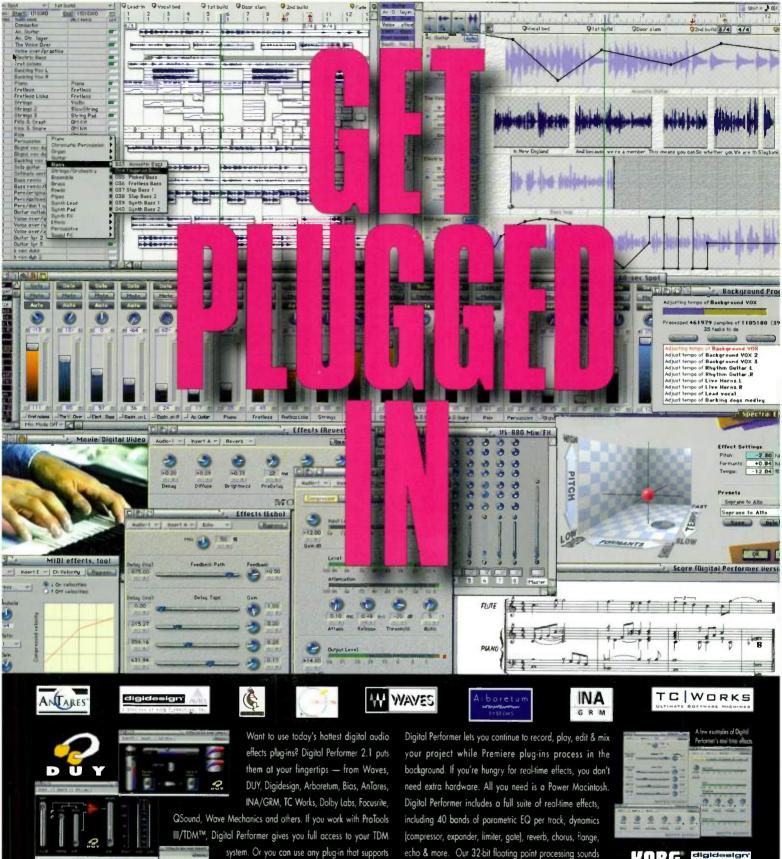
SOUND ON SOUND





SOFT FOCUS: CAKEWALK • MICROTECH GEFELL UMT800 MIC EES CV7 MIDI-CV INTERFACE • ATC SM20A MONITORS CREAMWARE MASTERPORT • SYNTECNO TEEBEE MKIII SYNTH SYMETRIX 606 DELAY • PC • APPLE • ATARI NEWS



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here's an old saying that you should be careful what you wish for, because it just might come true. A few years ago, when analogue tape recorders were the mainstay of multitrack recording, we wished for the purity of digital sound, and when ADAT brought us that, we

went on to wish for tapeless recording systems with random access editing. They came along too, but are today's MIDI + Audio sequencers all that we'd hoped for? One problem is that everyone wants a low-cost system, and low-cost usually means running a computer with an audio soundcard in it. I don't know

about you, but I've never yet heard a soundcard with analogue inputs and outputs that's anywhere pear as clean-sounding as the analogue tape machines we were so keen to replace. External converters will do the trick, of course, but they tend to cost more money

Then there's another threat to our pristine digital audio quality. This comes not from the audio hardware or soundcard, but from the computer itself. For me, the whole point of a desktop studio is that you can get on with making your own

music without needing a lot of space, but when you're working with a computer, space — or more precisely, distance — is exactly what you do need, and lots of it. The MIDI side of the equation is no problem, but try to record an electric guitar and the chances are that the hum and buzz picked up from the computer's monitor will completely wipe out all the spec-related benefits of digital recording, and in extreme cases you may not be able to get far enough from the monitor for the result to be usable at all. An LCD display might be the answer, but unless you're using a laptop, LCD monitors are currently hard to come by and expensive

when you can get them.

The next problem shows up when you want to record vocals, or an acoustic instrument such as guitar or flute. Put your headphones on, set the record levels, and what do you hear? Even before adding compression, the probability is that the disk drive and fan in your

computer will be unacceptably loud, and once you patch in your compressor it's like recording in a hovercraft test centre! Forget the noise your soundcard adds that's peanuts compared to the acoustic noise from the system

Unfortunately, if you're

working on your own, you probably can't get as far away from the computer as you'd like, because you still need to see the display and use the keyboard. Some systems allow you to use keys on your MIDI keyboard to start and stop recording, which might at least help you work at the other end of the room, but the only complete solution is to record in a separate room and get somebody else to operate the recorder. This, of course, completely negates the concept of the oneperson, one-room studio. We shall be looking into practical solutions or workarounds to some of these problems in the near future, but, in the meantime, it's a sobering thought that the only serious sequencing computer you can put in your studio that makes no noise whatsoever is an Atari! There's no fan and no disk drive, and though audio software support for the Atan is poor, you could always sync up a Fostex D90 and use the extension lead to locate the disk section in the next room. Mind you, even then you still have monitor buzz to deal with if you record electric guitar. Perhaps those unbearably smug people using hardware sequencers with tiny LCD windows got it right all along — they can sync up to a remotely located hardware direct-to-disk recorder and have the best in digital audio quality as well as an almost total absence of acoustic noise. Maybe the future of the desktop studio doesn't lie with the computer after all - what do you think?

Paul White Editor

SOUND ON SOUND

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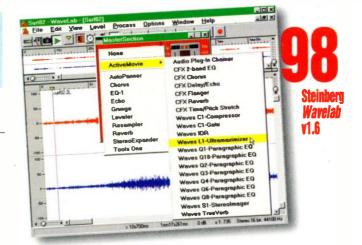
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PC MUSICIAN

Using DOS with your PC

























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The SOS web site can be located at the //www.sessubs.co.uk

practical respects, of course, CLM's 14dB pad

works perfectly well in its intended role, but Dr

Sackman is absolutely correct in pointing out the

inaccuracy of this arrangement. Reducing a

nominally +4dBu signal by 14dB will result in a

level which is 2.2dB (14dB-11.8dB) below the

nominal operating level of a semi-pro system (ie.

Before any of our readers suffer sleepless nights

out that the

error caused

by a 14dB

pad in this

application is

-12.2dBV or a nominal voltage level of 0.245V).

over this rather cerebral issue, let me point

dB Or Not dB?

Given that one of the most difficult-to-understand concepts in sound recording is the decibel (dB) and the various digits which are habitually attached to this term, it's surprising that Hugh Robjohns (in his August review of the CLM DB400 4-channel mic preamp) should have added to the confusion. I refer to his statement that "the push button introduces a 14dB pad in the output signal to convert from professional +4dBu levels to the semi-pro standard of -10dBV". The salient and practical facts of dB terminology are as follows:

- 1. Professional, balanced, audio is referenced to a theoretical nominal voltage level of 0.775V, which equates, in dB terms, to 0dBu. The common operation of professional audio is with nominal voltage levels of 1.23v, which equals +4dBu.
- 2. Semi-pro, unbalanced, audio is referenced to a theoretical nominal voltage level of 1V, which, *in this alternative measurement system*, is described as 0dBV. The common operation of such equipment is with nominal voltage levels of 0.316V which, *in this alternative measurement system*, equates to -10dBV.
- 3. If you ascend the dBV scale (from -10dBV) by 14dB you will arrive at +4dBV, which equals 1.58V.
- 4. If you descend the dBu scale (from +4dBu) by

14dB you will arrive at -10dBu, which equals 0.245V.

- 5. Because the two measurement systems are based on quite different voltage references, the difference between professional +4dBu (1.23V) and semi-pro -10dBV (0.316V) is, in dB terms, not 14dB but 11.8dB.
- 6. Manufacturers of 'step-up' and/or 'step-down' interface devices and especially their technical support engineers(!) often do not understand this important point.

Dr N Sackman Electronic Music Studios University of Nottingham



CLM DB400 4-channel mic preamp.

Hugh Robjohns replies: It's

ironic that Dr Sackman should take me to task here, because only a few weeks ago I contributed to an American book on exactly this topic, and with very similar calculations, as part of a detailed explanation of the decibel, standard operating levels in analogue and digital equipment, and their practical consequences. In my defence, the push button referred to on the CLM Dynamics mic preamp really is claimed to introduce a 14dB pad, and with the specific intention of converting between pro and semi-pro operating levels. In all

in the 'safe' direction, with headroom being increased rather than reduced — an important consideration with the prevalence of digital recorders. A 2.2dB error is also well within the range of adjustment provided by the input level controls of recorders, mixing desks or signal processors. A practical 'rule of thumb' I have taught at the BBC's technical training centre over many years is that the difference between +4dBu and -10dBV is 12dB—a useful guide, as most of the older BBC-designed mixers adjusted gain in 6dB steps.

PC 2 MC — Easy!

Super mag — I just wish it was easier (and cheaper!) to get here in the States. I've just read, on your web site, Dave Burraston's letter and Chris Carter's comment (from August 1997) documenting his method of saving Roland MC4 Microcomposer data by 'sampling' it into his Mac. This technique has been used for ages by the analogue synth community as an alternative to cassette-based storage, for all the reasons cited in Crosstalk. In fact, this technique prompted me to develop my shareware program, 202 Hack (available at http:// www.welch.jhu.edu/~geh/defective.h tml). This program allows users to program their Roland MC202 Microcomposer via the unit's cassette In port. Sequences are created on computer and saved as standard MIDI files (any decent sequencer package can do this). 202 Hack then translates the MIDI file into the audio data (WAV

format) required to program that sequence into the MC202. Simply



play the WAV file into the cassette In port of the MC202... you'll never use the '202's clunky sequencer interface again.

Other features include the ability to perform portamento coding (with a TB303-like mode), accent coding, and coding of sequences for both the 'internal' and 'external' MC202 patterns at the same time. More details about the program, including

screenshots and FAQs, are available at the web site. The program is written in Java, so it will work on most major platforms (read PC and Mac). It costs \$10 to register, or, alternatively, one can buy an item from my record label, Defective Records.

I look forward to your thoughts about this program, and keep up the superb work. Dan Nigrin

Derek Johnson replies: Thanks for the email, and the kind words about the mag. We're happy to let our readers know about your nifty little

software tool. Note that in order to use Dan's software, you'll need to have a Java environment on your computer. But don't worry: his excellent web site contains all the details you'll need, plus links to web sites where the relevant software extras can be located. While the system overhead for Java is heavy (the full Mac version comes as a 5Mb download, and requires 7Mb of hard drive space and 16Mb of RAM to run), 202 Hack is very small indeed. Incidentally, Dan's web site, as well as publicising his label, also has a collection of MC202 links, the most crucial of which has to be the site run by Shawn 202 (otherwise Shawn Mativesky). A more thorough site on just one machine couldn't be possible! Everything you'd want to know about the MC202, plus even more links, are here; check out http://www.citenet.net/noise/202/.

via email

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Crosstalk

Driving Ambition

The floppy drive on my Atari 1040STe has suddenly stopped working. I took it back to the shop where I bought it, only to be told that they no longer serviced Atari computers. I eventually found a shop that could help, using a drive from another ST. However, the drive still doesn't respond. The technician said it could possibly be the main board controlling the floppy drive, but could be of no further assistance. Can you advise me of a reputable Atari service centre?

Alternatively, if I was to change to a PC system, would it be possible to retrieve my sequence files, from Steinberg's *Cubase Score v2*?

CF Palmer London Derek Johnson replies: There are a number of service centres around the country still steadfastly offering back-up for the Atari — check out the classified ads in the back of the mag. In the London area, the first such company that comes to mind is Analogic Computers in Kingston (0181 546 9575). They are still offering a range of memory upgrades, replacement floppy drives and PSUs, and TOS 2.04 upgrades, not to mention mono monitors and ST computers.

My personal solution to the problem of keeping my Atari going has been to buy a cheap machine in good condition. It is still possible to pick up basic Ataris in Loot or local free ad papers for very small amounts of money



(typically £35-50). Touch wood, my main Atari is still going strong (not bad for a 10-year old computer!) but the machine I have in reserve means I can carry

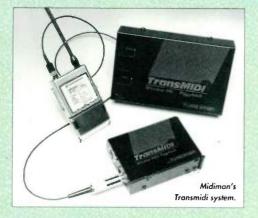
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on a session almost immediately if there's a problem, and I have one of each of the main components to cannibalise when the session's over. I even had the spare machine modified to take my working ST's 4Mb of RAM in the event of total meltdown.

On the subject of cross-grading to the PC, there really should be no problem — providing you've been using the

standard ST disk format, you should be able to stick your ST disks into the PC, and load your files straight into the PC version of Cubase.

MIDI — On The Wireless?



I'm having trouble tracking down a MIDI wireless system that I believe is available. Any idea where I might locate it?

Andy Turnbull Salford

Derek Johnson replies: There is indeed such a device: Transmidi, by Midiman, consists of a transmitter and receiver that piggyback onto any normal wireless system. The system works by encoding and compressing MIDI data to within the audio frequency range; its working range is entirely dependent upon your wireless system, and it runs for about four hours on a single 9V battery. Incidentally, Transmidi was reviewed in SOS in September 1992; it actually retailed for £419 back then, and can now be obtained, five years later, for £349 including VAT. Contact Midiman UK, Hubberts Bridge House, Hubberts Bridge, Boston, Lincs PE20 3QU (Tel: 01205 290680. Fax: 01205 290671).

Device Squad

In Martin Walker's helpful 'PC Notes' in August 1997's SOS, he mentions Windows 95's limit of 11 MIDI devices on multi-port interfaces. I run Steinberg's Cubase Audio on a Pentium 90 with 16Mb RAM and am just about to install an 8-port MIDI interface, which will take me over the 11-device limit. Your article states that the solution is to remove MIDI Mapper or the FM driver. Forgive my ignorance, but how do you actually do these things? I was under the impression that Windows 95 did not actually install MIDI Mapper unless you specifically requested it from the original disk. Can you put me out of my misery so I can get up and running?

Nick Fisher via email

Martin Walker replies: Glad to hear that you find PC Notes helpful. Regarding MIDI Mapper, I didn't ask for it either, and it's still sitting in my list of MIDI devices inside Sound Forge (but, strangely, not in Cubase). In general, the way to remove any driver is to enter Control Panel, System, and then Device Manager. Drivers associated with sound should be present under the 'Sound, video and game controllers' section. Once you have highlighted a particular driver, click on the 'Remove' button beneath the main window. Any Windows 3.1 MIDI drivers on your system can be found in Control Panel, Multimedia, Advanced, 'MIDI devices and instruments.' Click on the 'Properties' button, and then on 'Remove'. You may have to reboot Windows 95 after this, before any changes take effect.

I'm generally a trusting soul, and passed on the tip about removing MIDI Mapper as it was told to me by several MIDI interface manufacturers. When I actually tried it on your behalf, although it appeared as a device in many MIDI applications, it does not appear as a driver within Control Panel, and the only evidence of its actual presence was the file MIDIMAP.DRV, and there seems no way to remove this from the system! Even deleting the file from DOS (Windows 95 refused, as the system was already using it) and re-booting still left MIDI Mapper appearing in some lists, and multiple ghost entries in other applications, which suggests that it is needed by Windows 95.

General advice with large MIDI setups must therefore be to remove other drivers, such as FM soundcard synths, so that there are never more than 11 MIDI devices in total, although, again, the cleverness of Plug and Play may mean that next time you boot up, a little box pops up saying that new hardware has been found and Windows 95 wants to install the driver again. If this happens, contact your soundcard manufacturer for more specific instructions. Contact the distributor for your MIDI interface as well — most are happy to give technical assistance.



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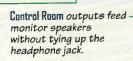
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shape of things to come

card • Sharp



otebook PC users looking for a General MIDI/Wavetable card now have another option in the £129.95 Jive WaveTable from Chase Advanced Technologies. This PCMCIA card, which is also equipped with a joystick controller, provides 128 GM-compatible instruments plus 61 drum sounds, and even offers an FM synth for use with older games that don't support wavetable cards.

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eurovision on!

he British Academy of
Songwriters, Composers and
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Great British Song Contest, the winner of
which will become Britain's entry in next
May's Eurovision Song Contest. The song
has to be a maximum of three minutes in
length, and must be a new work with no

exploitation prior to the competition.
BASCA has also kept the entry fee the same as last year — £40 plus VAT for members.

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beat your own drum



f you prefer the idea of programming your own drum parts to using sampled loops and breaks, but (like many of us) don't really know what makes a good drum pattern tick, you won't do much better than checking out a new book from PC Publishing. Beat It is written by Joe and Pauly Ortiz, of acclaimed building-block MIDI file company Heavenly Music, and provides over 200 drum patterns in grid form. So that you can hear how they work. there's an accompanying disk of MIDI files of the patterns, for PC, Mac or Atari computers. You can also read informative comments and analysis of the patterns you're programming. which are grouped into styles such as '50s and '60s, Pop, Soul and Dance, Rock and R&B, Jazz and World Rhythms. The book and MIDI file disk cost just £11.95, plus £1.95 UK p&p, and naturally are stocked by SOS Mail Order, order

- Mail Order, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.
- 01954 789888.
- 01954 789895.

cakewalk move to mac

C music software specialists
Cakewalk, makers of the eponymous
popular PC sequencing package, have
made the move into the Mac music arena
with *Metro*, a "professional-level, multitrack
MIDI sequencer with powerful features
suitable for the most demanding musician."

Metro is just the first product in what Cakewalk are calling an "aggressive crossplatform strategy". According to Cakewalk, it has an intituive interface to suit the beginner, but its more advanced features, such as SMPTE and QuickTime synchronisation, assignable and groupable mixing faders and multiple loop points within tracks, also enhance its appeal to more demanding musicians. Unique features such as 'Rhythm Explorer' and the 'Note Spray Paint' tool enable users to create and experiment with musical building blocks in real time.

Metro will be available in native versions for Power PC-based MacOS computers and older pre-Power PC Macs, so almost any Mac user will be able to use the software. The launch follows the recent announcement by Cakewalk of their cross-platform initiative. The company then

acquired Metro, which was designed to work in tandem with the well-known Macromedia Deck II multitrack digital audio software on a single Mac, and hired its developer, Jeremy Sagan.

Metro will be distributed in the UK by Cakewalk distributors Et Cetera, and has a projected UK price of £179.

Also new from Cakewalk is the

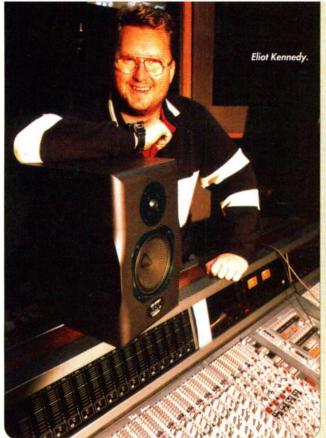
Cakewalk Musician's Toolbox II, included
with the new Cakewalk Pro Audio v6.0

Deluxe. The Musician's Toolbox is a
two-CD collection of MIDI and audio files,
tools and interactive tutorials, including
'Phunk 101: George Clinton and his

Mothership' (a collection of 101 stereo loops
from unreleased studio takes, never before

available in audio wave format); 'Long Live Rock: John Entwistle/Steve Luongo Bass & Drum Elements'; 'Beatboy Drum Sequences' (real-time MIDI performances by Rod Morgenstein, Richie Gajate-Garcia, Nigel Olsson and other prominent percussionists); and 'Scherzo-phrenic (classical and ragtime piano performances by Jordan Rudess and James Kometani).

- A Et Cetera Distribution, Valley House, 2 Bradwood Court, St Crispin Way, Haslingdon, Lancashire BB4 4PW.
- 1 01706 228039.
- F 01706 222989.
- W http://www.etcetera.co.uk



spirit's steel deal

Regular SOS readers will recall our September issue interview with Eliot Kennedy, of Sheffield's Steelworks studio, famous for his work producing and/or songwriting for such acts as The Spice Girls, Take That and Boyzone. Now Eliot and his partners Tim Lever and Mike Percy have put the Steelworks seal of approval on the Absolute 4P nearfield monitors from Spirit, buying a pair for the facility.

"We've been having top 10 hits for a few years now, so we know what we like when it comes to nearfield monitors", comments Eliot. "Although the 4Ps had been highly recommended to us, we were so busy setting up the studio that it was ages before we wired them up. When we did, though, we were all immediately impressed. I'm working with them all the time and love them so much the other two can't get them back from me."

- A Spirit by Soundcraft, Cranborne
 House, Cranborne Industrial Estate,
 Cranborne Road, Potters Bar, Herts
 ENG 3.IN.
- 01707 665000.
- 01707 665461.
- W http://www.spirit-by-soundcraft.co.uk.

the doctor is in.

n last month's sampler buyers guide the keen-eyed amongst you will have spotted an entry for Boss' new SP202 Dr Sample. Details of this little unit were being finalised as we went to press; one month later, it's all official, and spec is plentiful. The £299 Dr Sample, available from November, is an easy-to-use table-top device aimed squarely at DJs, dance artists and others who want access to sampling in as simple a package as possible. There are four sampling grades: the top rate is 31.25kHz, with the maximum internal sample time at the lowest sample rate being four minutes and 20 seconds. External storage is provided by "affordable" 2Mb or 4Mb SmartMedia cards, as used by digital cameras; each 4Mb card offers up to 35 minutes of sample time at the bottom sample rate. Samples are played back via eight pads, and the sample assigned to each pad can have its own sample grade, so you can mix hi-fi and lo-fi samples at will. Once a sample has been recorded and looped, its tempo can be set using the control knob; a bom indicator will actually calculate the tempo from the sample length. or the operator can input a tempo before sampling, using the tap tempo button. Built-in effects include pitch adjust, two filters, time stretch, delay, and ring modulation. The SP202 includes a built-in mic, plus two audio ins. MIDI control allows samples to be easily triggered as part of a MIDI sequence. Look out for an SOS review as soon as the Dr Sample lands.

Boss parent company Roland have also launched two new pairs of desktop music monitors, the affordable MA9 (£99) and the downright cheap MA4 (£59). The MA9s feature a 16W amplifier, 4-inch woofer and 1.5-inch tweeter plus tone and echo effect controls. The even smaller MA4s use an 8W amp, and offer independent bass and treble controls. Both sets of monitors are shielded, so can be safely placed near a computer monitor.

The latest in Roland's SR-JV80 series of sound expansion boards for JV- and XP- series synths is the SR-JV80-11 Techno Collection. The name says it all, and the board features 255 waveforms, 255 patches, MHDI syncable (on the XP80 and JV2080) phrase loops and eight full rhythm sets aimed at JV/XP users who want the sonic raw material to suit techno, dance, ambient or jungle styles. The board costs £255, and will be available in November.

- Roland UK Ltd, Atlantic Close, Swansea Enterprise Park, Swansea, West Glamoraan SA7 9FJ.
- Brochure line 01792 515020.
- 01792 799644.
- W http://www.roland.co.uk



▼ tudio design and construction company The Studio Wizard Organisation are finding the Internet an invaluable marketing tool. In its first year, the SWO web site brought in no less than 25% of enquiries and 20% of new business. Other customers have found the SWO's on-line brochure service helpful in accessing instant data about studios, and have also made use of the data pages on equipment line-up and the ad pages listing customers' equipment for sale. The most recent job to come SWO's way as a result of the web site has been a new studio complex currently being built for Manuel Faria's Indigo Studios in Portugal. Manuel Faria comments: "We were looking for a company who could facilitate every aspect of our project. I typed 'Studio Acoustics' nto an Internet search engine and was led immediately to the SWO."

SWO are going from strength to strength, with recent projects including a state-of-the-art home studio built by the organisation on "an offshore UK island". For security reasons we can't say who the studio was built for, but with an

equipment brief including full automation, topof-the-range digital and analogue technology and "no computer monitors" you can work out that it's someone pretty rich and famous!

SWO chose to fit the bill with a 24-track Otari Radar digital recording system and a Soundtracs Solitaire desk with 64 VCA-automated inputs and full virtual dynamics, plus tube outboard from TLA (Indigo compressors and voice channel), and a Lexicon 300 processor taking pride of place in the effects rack. SWO did the lot — including designing and converting the building, supplying the equipment, wiring the system and training the client, who had previously had a Portastudio, to operate the new facility.

- The Studio Wizard Organisation,
 1 School Cottages, Billingford,
 Dereham NR20 4RE.
- 01362 668900.
- 01362 668900.
- howard@studiowizard.com
- W http://www.studiowizard.com

shape of things to come

Korg's ivory power

he intense interest in Korg's new Z1 polyphonic physical modelling synths (see the exclusive full review starting on page 200 of this issue) has tended to overshadow the recent launch of another of the company's keyboards. The £1799 SGProX is an updated version of the mid-'80s-vintage SG1 Sampling Grand, and features 24Mb of PCM waveform memory, an 88-note weighted keyboard and a mass of master keyboard functions. Chief amongst the sampled waveforms is a stereo sampled grand piano, but this is joined by electric piano, Clavinet, organ, strings, synth pad and bass sounds — not to mention the piano from Korg's own classic M1 synth. The SGProX offers 64 user-editable programs, plus 12 stereo digital multieffects; as a master keyboard, it can control up to eight



external MIDI devices, with split points, volume and program changes, and two internal voices at once. A further 64 performance memories store combinations of voices and controller information.

Other Korg news this month is that Michael Virtue, keyboard player with UB40, has been using an iX300 interactive workstation while recording the band's new album, Guns in the Ghetto. Michael's keyboard line-up also includes a Korg X3 and 01/W FD.

- Korg UK Ltd, 9 Newmarket Court, Kingston, Milton Keynes MK10 OAU.
- 01908 857150.
- 01908 857199.
- info@korg.co.uk
- W http://www.korg.com

open & shut case

...........

teel doors might not seem like the ideal subject matter for Sound On Sound, but if you're in the process of constructing a studio, doors are one of the things you'll have to be thinking about. Leading steel performance door manufacturer Accent-Hansen have just published a new technical manual for steel doors, featuring information on their whole range. This includes spec on the Soundshield door, which provides acoustic protection up to 55dBA and can be made with a variety of core materials, depending on location demands. Soundshield incorporates high-performance seals and can also be designed to include fire and/or security specifications.

- A Accent-Hansen, Greengate Industrial Park,
 Greengate, Middleton, Manchester M24 1SW.
- 0161 284 4100.
- £ 0161 655 3119.



SOUND ON SOUND . October 1997

ABERDEEN BARNSTAPLE REI FAST RIVERY BIRMINGHAM BIRMINGHAM BLACKPOOL BOURNEMOUTH RRIGHTION BRISTOL BURNLEY CAMBRIX CARLISLE CHESTER COLCHESTER CORK COMENTAL CREWE DONCASTER DOTTELAS DIBUN DUNDER EDINBL RIGH EDINBI RIGH FARFHAM GLASCOM

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Percy Priors 01494-528733 The Music Station 01463-255523 0181-546 9877 **Farth Music** 01592-260293 Sound Contro 01524-847 943 0113-240507 0116-2624183 Ad Lib 0151-486 2214 Turnke 0171-379 5148 London Microphone Centre (LMC) 0181-743 4680 0171-258 3454 Raper and Wavma 0181-800 8288 HHR Communications Ltd 0181-062 5000 Studio Spares 0171-482 1692 0171-609 3939 Music Lab 0171-488 5392 0161-236 0340 A1 Music Centr Sound Control 0161-877 6262 Carlsbro Academy of Sound 01623-651633 0191-232 4175 Sound Control Willow Communications 0160+21525

01425-470007 The M Corporation (TMC) AJS Theatre & Lighting Supplies 01425-480 698 Music Village (Chadwell Heath) 0181-598 9506 Carlsbro Academy of Sound 0114-2640000 01932-566777 Marquee Audio Honky Tonk 01702-619615 01438-750751 01744-730424 Dawsons Music East Coast Music (RCM) 01534-80575 Axis Audio Systems 0161-474 7626 Dawsons Music 0161-477 1210 Carlsbro Academy of Sound 01782-205100 Music Control 01270-883779

| JBS Music Stores | 01892 515 007 | Way Out West | 0181 744 1040 | 0181 744 1050 | 0181 744 1050 | 0184 574 1050 | 01924-371766 | 01925-632591 | 01925-632591

seans Music 0191-416 2385 ve Sound 01923-246 282 wars Music 01942-2-4-660 Amplification 01257-426923 Brauts 01962 866 283



ow you can add the world's most compact, professional powered mixer to your pro-audio toolkit.

At the heart of Folio Powerpad is an audiophile-grade 30 Watt x 2 power amp: all you need is a pair of speakers for an instant PA or studio-based setup.

And Folio Powerpad sounds like a big console because it's specced like one: leading edge electronic and industrial design ensures the trademark audio "transparency" and ease of use for which Soundcraft consoles are renowned.

By utilising Spirit's advanced surface-mount manufacturing methods, Powerpad manages to pack these attributes and a host of features into a portable frame that's easily affordable.

With noiseless, high headroom mic preamps and the sound of real British EQ included, what else could you need from your pro-audio toolkit? Nothing - except perhaps an engineer!

Powerpad's features include:

- INTEGRAL HIGH QUALITY 30 WATTS X 2 POWER AMPLIFIER
- 4 MONO MIC/LINE INPUTS with high quality, noise-free, high headroom preamps, phantom power and 2 band EQ
- · 2 STEREO INPUTS with switchable RIAA preamps allowing direct connection of turntables
- · Post-fade AUX SEND and STEREO RETURN for effects
- Separate MIX OUTPUT for additional external amplifier
- Separate TAPE RETURN with level control
- Amplifier Clip & Thermal PROTECTION
- Rugged construction

Engineer not included.

Folio Notepad

has all the features of Powerpad but without built-in power amplification.

Mixing Console

inc VAT (UK RRP)

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



H A Harman International Company

Please send me more information on Folio Powerpad 🗌 🛮 Folio Notepad 🗐

ULTIMED'

What will you use Powerpad/Notepad for?

What magazines do you read?

Please send me a FREE copy of the Folio Applications Guide on how to get the best from your mixer [

POWERED,

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Mixer with

inc VAT (UK RRP)

30W x 2 Amp







shape of things to come

George Martin's AIR Studios have recently added a 16-track Digidesign Pro Tools PCI/TOM system to their equipment roster, complete with 888 I/O interface, two 2Gb drives, a Rorke Data removable hard drive kit, and various plug-ins, supplied by dealer Music Lab. Former AIR Chief Engineer. now freelance producer, Matt Butler also bought a new Pro Tools 4 TDM system: many of his projects end up at AIR, so ow he's fully compatible.

1 Digidesign 01753 653322 F 01753 654999.



Larking Audio have beloed dance remix/production duo Alun Harrison and Graham Simmons make the move from bedroom to purpose-built studio. Their equipped with a 32-channel Soundtracs Solitaire mixer, Spendor SA300 monitors, an Akai 53200 sampler, Emu Orbit sound module, Novation Bass Station, Alesis MIDIVerb 4, TL Audio 2051 valve voice processor, dbx 263X de-esser, AKG C3000 mic. Blue Systems Can Amp and Beyer DT250 headphones. The duo's recent remixes include aker Pimps, Tori Amos and Fish. T Larking Audio 01234 772244.

The next Radio 1 Sound City event takes October 26 to November 2. There'll be about 25 name and local bands playing every night, with cult movies, art exhibitions comedy events, street entertainers and more. Radio 1 will broadcast live from the festival every night, during Steve Lamacq's Evening Session. In addition, there will be music industry seminars, workshops and talks. Oxford Music Central 01865 798791

Just as SOS was going to press, we heard the latest from Sound Valley Distribution, who have announced the arrival of the new Joemeek VC6, preamp, Joemeek optical compressor, and enhancer, the 1U rackmount VC6 comes with a built-in power supply, and offers complete control over compression attack and release times, as well as compression ratio. The projected release price is £349 including VAT. More details when we get them, and, as usual, expect an SOS review as soon as possible.

Sound Valley 01494 434738.

close friends get to call it TC...

he synchronisation STUDIO 64 facilities of Opcode's new Studio 64X multi-port MIDI interface for Mac and PC (reviewed in May 1997's SOS) have just been enhanced. If you require more than the basic machine's SMPTE timecode options, the Studio 64 XTC may be for you: it offers simultaneous Wordclock and Superclock outputs, allowing sampleaccurate sync of Pro Tools with Wordclock-capable recorders such as the Tascam DA88 (with SY88 card), Akai DR4, Emu Darwin and some DAT machines. It can also control Alesis ADATs

through MIDI Machine Control without any extra hardware The Studio 64XTC can write SMPTE and generate

Wordclock or Superclock from incoming SMPTE; it

accepts video and blackburst signals as reference, and routes MIDI Time Code and MIDI Machine Control data. Obviously, it will also function as a 4x6 MIDI interface with patchbay facilities. Forthcoming options include a user-installable Sony P2 connector, allowing control of compatible video recorders.

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

- info@scvlondon.co.uk
- W http://www.scvlondon.co.uk

facts

IDI data filers are ideal for MIDI musicians who don't want to take a computer on stage, and for those who don't want to use a computer at all, yet need some way of storing banks of patches from their MIDI equipment. Yamaha's MDF2 has long been a favourite, and now the company have released the MDF3 MIDI Data Filer, which builds on this popular format. While superficially similar to the older machine, the MDF3 has a significant improvement: it can use high-density as well as double-density floppy disks (in MS-DOS format), with an increase in maximum file size to 1200KB, the capacity of a high-density disk. A disk can hold up to 99 files, and each file can have its own name. With the MDF3, you'll be able to store and retrieve banks of sounds for your synth, play back Type 0 and 1 Standard MIDI Files (direct from floppy disk, so there's no loading time), and record simple sequences with full tempo control. The MDF3 will run on batteries, so is truly portable, and offers a footswitch socket, a feature missing from the MDF2.

If you want to investigate the full range of Yamaha

pro audio products, and have access to the Internet, check out Yamaha's Japanese web site - it's in English as well as Japanese. Point your browsr at http://www.yamaha.co.jp for comprehensive technical specs, tips, FAQs and pictures.

Speaking of Yamaha pro audio products, we're told that dance production team K-Klass have recently equipped their newly built studio with an 02R digital mixer; The Bunker, as the studio is called, will be the location for the recording of the outfit's forthcoming album, the follow-up to their 1993 debut Universal. The desk will be used alongside Emagic's Logic and Digidesign's Pro Tools.

- A Yamaha Kemble Music UK Ltd, Sherbourne Drive, Tilbrook, Milton Keynes MK7 8BL.
- Brochure Line 01908 369269.
- 01908 368872.



Yamaha MDF3.

Our customers' comments

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

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

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

Garth Webber, Red Rooster Studio, Berkeley CA

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

Peter Thorn, What If? Productions.



Just about the only sound as sweet as our EQ!

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



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SOUNDCRAFT, HARMAN INTERNATIONAL INDUSTRIES LTD., CRANBORNE HOUSE, CRANBORNE RD.,
POTTERS BAB, HERTFORDSHIRE, ENG 3]IN, UK. TEL: +44 (0)1707 665000 FAX; +44 (0)1707 660742,
SOUNDCRAFT US, HARMAN PRO NORTH AMERICA, INC., AIR PARK BUSINESS CENTER 12, 1449
DONELSON PIKE, NASHVILLE, TN 37217, USA TEL: 1-615-399-2199 FAX; 1-615-367-9046

shape of things to come

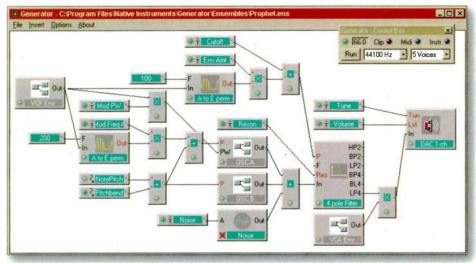
talkin' 'bout my generator

erlin software developers Native Instruments have started shipping a fully-featured release of their Generator v1.0, an "advanced modular synthesizer" for PCs with Windows 95. Essentially, Generator is a virtual, polyphonic, multitimbral modular synth controlled via a "powerful graphical editor" on your PC. Basic modules can be interconnected freely to form complex sound generation architectures. Both subtractive and FM synthesis, as well as experimental techniques, can be used with equal accessibility. A built-in library contains

everything from oscillators to resonant filters to distortion.

The user can freely connect modules, and any parameter can be set to be controlled by any MIDI event, with all changes made in real time. A quality soundcard is even included as part of the package. WAV files can be imported into Generator for processesing, and any sound produced by the software can itself be imported as a WAV file. A forthcoming version of Generator will feature support for Emagic's Audiowerk8 PCI digital audio card; other future plans include a vocal formant filter, morphing, an arpeggiator, sample playback oscillator and physical modelling. Currently, Generator is only available direct from the manufacturer, and costs £365 plus shipping.

- Native Instruments, Willibald-Alexis-Str. 5, 10965 Berlin, Germany,
- 0049 30 691 4966.
- **1** 0049 30 691 4966.
- info@native-instruments.de
- W http://www.native-instruments.de



Native Instruments' Generator.

out of **Austria**

ax Audio have been appointed as UK distributor for the HÖF Professional Audio product range. The company was set up by Mike Reay and Mike Gentle of EMO Systems as a separate marketing company sharing premises with EMO.

Manufactured in Austria, HÖF products are aimed at high-end recording studios, broadcasters, and rental companies. The HÖF range includes a Spectral enhancer for livening up individual tracks



or entire mixes, and a stereo limiter/compressor (the Dynamic Master, reviewed on page 242 of this very issue) for mastering purposes, which, when placed between an analogue desk and a digital recorder, will allow an average of between 6dB and 10dB extra gain, while transparently preventing over-modulation.

- Max Audio, Durham Road, Ushaw Moor, Durham City DH7 7LF.
- **1** 0191 373 0787.
- 0191 373 3507.

It's not often that local authorities get Natalia Silver, head of cultural services at Hereford City Council, actually came up with the idea for a compilation CD project. A producer, engineer, recording studio and the bands and produce the CD, entitled Common Ground. Funding came from local authorities, the Rural Development Commission and West Midlands Arts, and the project also included a number of music business seminars. The CD has resulted in interest in some of the featured bands, with two groups actually getting lottery cash to help fund their own CDs. Lottery funding has also been allocated to a new arts venue in Hereford itself.

Back in the '70s, producer Mike Howlett played in a band that eventually became the Police. As Strontium 90, the four-piece recorded demos and gigged, with some gigs being recorded. These tapes have now been cleared for release, and will see the light of day on ex-Police main man Sting's label, Pangaea Records, as Police Academy.

The business and assets of Mayking Multimedia Ltd and Mayking Cassettes Ltd, which recently went into administration, have been acquired by Dutch company DOCdata NV. Mayking's CD and cassette duplication operations will be continued by DOCdata(UK) Ltd. a subsidiary of the Dutch company, which has operations in Holland, nce, Germany and the USA.

0171 924 1661.

There is to be a Young Composer's Award at this year's Huddersfield Contemporary Music Festival. Entrants must be under 30, and will have a choice of writing for solo piano and 14-piece sinfonietta, electric guitar with optional tape, or three assorted place from the 19th to the 30th of

01484 425082

hcmf@hud.ac.uk

In the Sample Shop's Golden Greats section of last month's sampling special, we noted that Q-Up Arts' Psychic Homs CD-ROM was case, since this disk, and the entire Q-Up ARts range, is available from Keyfax Software. Our apologies for any confusion Recent titles include: Poogle Bell's Street Beats, Latin Groove Factory, Pandora's Toolbox by David Torn and Ambient Realmsby Kit Watkins. We'd also like to remind you that the One World Song Contest, run by Q-Up Arts and Keyfax, has had its closing date extended to November 30.

01491 413938.

http://www.gmedia.net/keyfax

SOS can be reached on CompuServe; our email address is 100517.1113.

Our full Internet address is 100517.1113@compuserve.com

The SOS web site is located at http://www.sospubs.co.uk



The 564 Digital Portastudio®

TASCAM 414

DIGITAL C

TASCAM 564 Digital Portastudio

features TASCAM's 4x faster MD drive giving you high performance digital multitracking on a pocket size disk.

37 minutes of (4 track) record time gets you an entire song on a single disk including overdubs (up to 10 track recording and 4 bounce-forwards, without over-recording previous tracks) and final mix, complete with

sequencer-style non-destructive editing.

TASCAM Porta ogmill

Digital tracking without the bother and expense of additional Hard Drives or the hassle of down-loading and up-loading the Hard Drive, everytime you want to work on omething different. With the 564 just insert another Disk, the same as you would a cassette in any other Portastudio®. NO SCSI!

In fact, with the TASCAM 564 digital multitracking is as easy as cassette - that's why it's a Portastudio®.

TASCAM 5 Marlin House, The Croxley Centre, Watford, Herts, WDI 8YA.

top of the range Portastudio® mixer section

3-band EQ with sweepable mid

2-aux /effects sends on each channel

fully flexible monitor section

balanced XLR and jack inputs

individual outs for all 4 tracks

digital stereo output

MTC and MIDI clock output

looping and "best of

TASCAM 488 MKII

TASCAM 424 MKH

5" take function

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shape of things to come

join the **quad** squad

lasmon's new quad-speed CD Recordable drive, the CDR480 (£511 including VAT), features enhanced calibration with in-media tracking, full packet writing and true CD-ROM support — in fact, it will operate as an 8x CD-ROM drive. The price includes SmartCD mastering software and FloppyCD, which allows Windows 95 users to treat the drive as a data-storage device.

Further options incorporating SCSI controller and cables are also available. The CDR480 supports all the latest write methods, including disc at once, multi-session, track at once and fixed and variable packet-writing.

- A Plasmon Data Ltd, Whiting Way, Melbourn, Royston, Herts SG8 6EN.
- 01763 262963.
- F 01763 264444.

Behringer's Buss service

ehringer's Eurodesk family of miliers continues to grow, with the mid-priced MX3282 and MX2442 Essentially a straightforward 8-buss and 4-russ respectively, the desks offer a comprehensive feature set. Mono input channels feature 3-band EQ with swept mid, eight auriliary sencs, insert points, and solo and mute switches. Each desk also has four sets of

stereo inputs I with full EQ, aux send and routing facilities). There are also four aux returns (aux return 1 and 2 have full routing). Other nice touches include, talkback, separate control room and headphone level controls, phantom power, and subgroup insert points. The most attractive point, however, must be the prices f1599 for the MX3182 and f999 for the 2442.

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

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educationcorner

ROLAND

Roland UK are presenting their fourth residential conference for music teachers: Technology for Creativity 1997 will be held from October 10-12 at Stoke Rochford Hall, the NUT's conference and training centre. In all, 80 teachers, from primary and private piano teachers to higher education, will be presented with a programme dedicated to showing how to make appropriate use of information technology to deliver the National Curriculum. A range of Roland products applicable to classroom use will also be on show. For further information, contact Alistair Jones, Education Manager, on 0181 810 4825, or Tim Walter, Education Sales Manager, on 0941 121300.

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

SOUTH THAMES COLLEGE

The South Thames College at Wandsworth is offering a variety of music technology courses: take your pick from one-year or two-year full-time courses, part-time and evening classes or

Saturday school. The college has 45 computer workstations, each equipped with a Korg X5 synth and Steinberg's *Cubase* sequencing software, and a variety of analogue and digital recording studios. Several courses also offer elements of live techniques, instrument repair, multimedia authoring, web page creation, video editing and radio production.

- A South Thames College, Wandsworth High Street, London SW18 2PP.
- 0181 918 7005.

UNIVERSITY OF SALFORD

The University of Salford has installed two post-production teaching studios during the last year, and are currently developing a PC workstation room, which will be used to teach hard disk recording, digital editing and sound synthesis techniques. The new suites join the university's established studios, which include two Alesis ADAT-based studios, a music technology room (equipped with four synthesis/sampling/sequencing workstations) and various test

rooms (I bet your coilege doesn't have an anechoic chamber, a reverb/transmission suite and an IEC-standard listening room). Undergraduate courses include a BEng Electroacoustics, BSc Audio Technology and BSc Music, Acoustics and Recording, with a post-grad PGDIp in Reproduced Sound also available.

- A Department of Acoustics and Audio Engineering, University of Salford, The Crescent, Salford MS 4WT.
- T 0161 295 3313.
- 0161 295 5427.
- W http://www.salford.ac.uk/acoustics

ALCHEMEA

In July, students from audio engineering college Alchemea's Milan branch were involved in the recording of a production of Wagner's Parzifal, performed by the orchestra and choir of St Petersburg, with Placido Domingo. This five-hour long opera also needed video links and radio feeds (it was broadcast live), and will apparently be shown all over Europe next Good Friday. Students also provided the sound system for the Oscars Della Musica, a "new initiative" by Italian national broadcaster RAI aimed at providing recognition for jazz and classical musicians in

Italy. The success of Alchemea's students in pulling off such big jobs has led to the school being asked to record another three concerts.

- Alchemea, The Windsor Centre, 2-18 Britannia Row, London N1 8QH.
- 0171 359 3986.
- F 0171 359 4027.
- info@alchemea.demon.co.uk

SOUTHWARK COLLEGE

A successful bid for National Lottery cash means that Southwark College's music department have now completely refitted their teaching areas and are offering a BTEC in popular music and an evening class City and Guilds recording techniques Part 1 course. The facilities include two Alesis ADAT-based digital studios, four sound-proofed reheasal rooms, a keyboard lab, and sound-to-picture synchronisation in conjunction with the audio-visual department's video-editing suite. There is also a large, fully equipped theatre.

- Southwark College Music
 Department,
 Surrey Docks Centre, Drummon
 Road,
 London SE16 4EE.
- 0171 825 1617.
- 0171 815 1525.



new Wave PCS from **Red Submarine**

ork-based company Red Submarine have introduced a new range of PCs aimed at musicians and audio pros. Their basic 'Composer' system (£1495) is based around a 166MHz MMX PC, with a Turtle Beach Fiji card and Cakewalk v6; it's capable of recording MIDI and audio side by side. The home studio system (£1895) offers four highquality analogue inputs and outputs for audio recording, as well as 64 MIDI channels, again using Cakewalk v6. A 24-bit 8-track version (£2995) offers digital ins

and outs, and a large SCSI hard drive. A 16-in/out version costs £4695, while £5395 gets you the full 24-track system. Also aimed at the pro market is a CD editing and mastering system, at £2495, which can record and play back 24-bit audio and offers full compression, EQ and PQ coding.

- A Red Submarine, 40
 Heslington Road,
 York YOL SAU
- 01904 624266.
- **1** 01904 635636.
- info@sub.co.uk
- W http://www.unityaudio.co.uk

SOS OnLine

ver the past few months, the intrepid netizens amongst you will have already found the new Sound On Sound web site (http://www.sospubs.co.uk) during its construction period. The electronic version of Europe's favourite (and best-selling) hi-tech music mag is now fully on line, and provides snippets of news from Shape of Things to Come, your queries answered in Crosstalk, and plenty of Free Ads. SOS OnLine is interactive, so you can search a database

of past articles, contact the mag, email queries or send in Free Ads. Note that SOS OnLine is best viewed with Netscape's Navigator v3.0; it also uses Macromedia's Shockwave plug-ins to provide animated screens. And of course, Sound On Sound's sister publications, Sound On Stage, SPL and Sound Pro, can also be found on line.



SOS OnLine.

loud & proud

new range of "high-performance" studio tools is being launched by DACS. Each Clarity MicAmp microphone amplifier and Clarity HeadLite headphone amp is hand-made, individually set up and comes complete with a three-year guarantee. The MicAmp is a 2-channel, low-noise, discrete component-based device, while the HeadLite is a 4-in, 4-out amplifier with input selection for each channel. It can drive any

impedance of headphone to the headphone's maximum level, without distortion. Soon to join the range are the KeyBoard DI/preamp, which boosts signals to balanced line level, plus a series of 24-bit, 96kHz/88.2kHz analogue-to-digital convertors.

DACS have also launched a web site where you can check out their new range of products, including the MicAmp and HeadLite, and browse data sheets for all their current products. The site will also have regular special offers, so repeated viewing might be recommended.

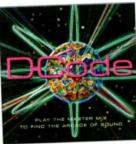
- A DACS Ltd, Freepost NT1808, Gatehead NE10 OBR.
- 0191 438 5585.
- **1** 0191 438 6967.
- douglasjpdokerty@compuserve.com
- W http://www.dacs-audio.co.uk



DACS' MicAmp.

dance against drugs

t's not often that we run press releases from government departments, but the latest tool in the Health Education Authority's drive to inform "young people" about drugs and their risks is a nifty interactive CD-ROM, D-Code. The disc, which runs on both Mac and Windows 3.1 or 95 platforms, offers a range of drugs education games, with the emphasis on music, graphics and playability. The desirability of the disc is further enhanced by a collection of new mixes of



dance tracks donated by BMG/Deconstruction.
Featured artists include Republica, Lionrock, Death in Vegas and Roger Sanchez. *D-Code* is being promoted in HMV stores throughout England, and is (amazingly) free while stocks last.

unity fraternity

nity Audio, UK distributors for Dynaudio Acoustics monitors, have supplied monitoring systems to several 'name' artists. A pair of M2s and a DCA450 amp have been sold to Chris Difford of Squeeze and installed at Helioscentric Studios, which are co-owned by Difford and Demon Records. In case you were wondering, the studio's strange name comes from the 1972-vintage Helios desk that is at the heart of the facility. It's joined by a Mac-based hard disk system and Yamaha 02R digital desk, plus loads of outboard. Birmingham band Ocean Colour Scene are

currently using a pair of BM15s, driven by an A3 amp, while recording their new album, while two members of Jamiroquai (drummer Derrick McKenzie and programmer Winston Rollin) have each ordered a pair of BM10s. Finally, producer Mike Hedges, already a Dynaudio fan, has installed a customised main monitor system in his commercial studio in Normandy; while recording Wah! at Abbey Road, Mike auditioned some BM6s and BM15 nearfields, and as a result, Mike and the band ordered three pairs of BM15 and two pairs of BM6s between them.

- A Unity Audio Ltd,
 Upper Wheeler House,
 Colliers End, Herts SG11 1ET.
- 1 01920 822890.
- F 01920 822892.
- E sales@unityaudio.co.uk
- W http://www.unityaudio.co.uk

shape of things to come

spec up, price down

ascam have launched an improved version of their popular DA20 DAT recorder, and the new machine not only offers an enhanced feature set but also a drop in price. The £699 DA20 Mkll offers an improved error-correction system, along with an error-rate detection system which automatically checks both tape and head integrity before audio is committed to tape. In addition, a new Sampling Monitor Mode aims to prevent head and tape

wear when monitoring the audio source. "Better recording and playback performance than before" are offered as a result of improvements in the implementation of Tascam's 1-bit A/D and D/A convertor circuitry, the internal electronics layout, and both the transport mechanism and software servo control. The DA20 MkII records at 32kHz, 44.1kHz and 48kHz sample rates, and the sensitivity of Start IDs can be set to four different levels, allowing the automatic ID function to be triggered by quieter programme material

- A Tascam, 5 Marlin House, The Croxley Centre, Watford, Herts WD1 8YA.
- 1 01923 819630.
- F 01923 236290.



price cutcorner

Akai have announced a big list of price cuts in their samplers, synths and expansion boards. The cuts range from £150 to £1000, making the range even more competitive; Here's a list, with the old prices in brackets:

• Remix 16: £599 (£749) • S2000: £799 (£899) • \$3000XI: £1499 (£1799) CD3000XI: £1699 (£2299) S3200XL: £2499 (£3499) • SG01 modules: £229 (£299) • EB16 £229 (£399)

• IB208P £249 • IB204Q £299

A Akai UK Ltd, Haslemere Heathrow Estate, The Parkway, Hounslow, Middx TW4 6NQ.

0181 897 6388.

F 0181 897 6388.

Korg have also been slicing prices lately (spot the good deals on the Trinity workstation range in our dealer ads). Increased manufacturing and a favourable exchange rate against the Japanese Yen have contributed

to the new £1175 retail price for the Soundlink 168RC digital mixing desk. Check out our review back in December 1996 when the desk retailed for nearly £2500! — for further details.

Korg UK Ltd, 9 Newmorket Court, Kingston, Milton Keynes MK10

Brochure Line 01908 857150.
01908 857199.

It's also worth checking out some stunning price cuts from Marantz on their top-quality range of CD recorders. Improvements in productivity and resulting economies of scale have enabled Marantz to slash around £1000 from the price of the CDR620. This unit, which features a wired remote control, SCSI II, AES/EBU and S/PDIF digital interfacing and balanced analogue in/outs, used to retail at £3466 and now costs just £2344, while the CDR615, which used to cost almost £2200, is now just over £1600.

T 01932 854544.
F 01932 854544.



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.

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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 ADA



Valdorf Wave, Pro-Tools IV and Big by Langley in Studio I



Huge range across Mac, PC and Acorn platforms

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- 12 Keyboards & Guitars
- 13 Mics, PA/DJ, Mixers & Monitors

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

MASTERS OF ALL TRADES

Of all the microphone manufacturers, probably none have such a comprehensive range as AKG, with specialist and general purpose mics to cover all applications. Diversity does not come at the expense of quality however, with the know-how of classic mics like the

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affordable levels.



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C1000 CONDENSOR MIC



RRP £286

C414 MULTI PATTERN MIC



C3000 LARGE DIAPHRAGM MIC



experience in building large diaphragm mics such as the C12 and C414, but by using modern vanufacturing techniques, and only

C12 VALVE MIC

ecognised the gro valve technology can , and have re-released the C in the form of the CF2VR. Not in everyone's price range, but an absolutely consideration performer.

RRP £3700

WMS51 WIRELESS MIC SYSTEM

-C420

Headset

MICROMIC RANGE
Whatever your miking application, the Micromic range has got it covered, and at an affordable price! All mics are available in 'PP' (phantom powered) or 'B' (battery pack (£47 - not needed if used with the WMS radio system), which can power two mics simultaneously.



C411 Acoustic Pickup MicroMic

NEW PRODUCT



C417 Lapel MicroMic **NEW PRODUCT**

£70

£133

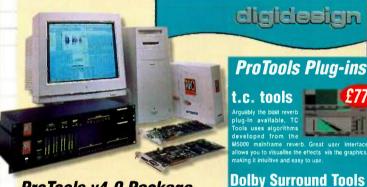
£880





C419 Instrument MicroMic

MicroMic



ProTools v4.0 Package

- 7300/166 32/2.0CD & keyboard
- Apple 1705 17" MS Display
- ProToole Core & 882 Interface 2 Gbyte Approved HD
- Microsoft Office

ProTools Project Package

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- Apple 1705 17" MS Display 2 Gbyte Approved HD
- ProTools Project Core
- 882 VO Interface
- Microsoft Office

AudioMedia III Package

- Performa 6400/200 32/1.6/CD 28.8 modem & Keyboard
- Apple 15" AV MS Display
- AudioMedia III card
- ProToois PowerMix Software



NEW

MEW

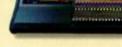
Antares Auto-Tune

Focusrite D2



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BIG by Langley



- 4 band EQ, 8 Auxiliaries
- 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

demonstration a forty-four 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 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.

GREAT VALUE 3P(0)

£117

NEW DUAL COMPRESSOR

DUAL MICROPHONE AMPLIFIER

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DYNAMICS DA20 **PROCESSORS** FOR EVERY **APPLICATOIN**

DBX is one of the oldest and most respected names in the audio industry. Classics like the 160 and 165 have given

them a reputation for producing no compromise audiophile equipment. Fortunately, modern manufacturing techniques now mean the rest of us can own DBX quality at affordable prices.



ing range with the flexible new 1066. In addition to all the professional features expected from this respect-

ed brand, the 1066 offers switching between their patented "Overeasy" soft-knee and hard-knee modes, sidechain switching, ultralow 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.



266 DUAL COMPRESSOR GATE

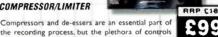


anced inputs, precision LED metering and sidechain

insert. Front panel selection of stereo or dual mono operation, all in a standard IU rack design. Entire dbx range on demo at Turnkey!

£199

163A



the recording process, but the plethora of controls that many of them are fitted with can often lead to

confusion and ending up with a worse result than you started v The DBX 163A and 263A are designed to give you high quality res 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 mixer 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

263A DE-ESSER/COMPRESSOR



DAT MACHINE

2639

DA30 MKII DAT RECORDER

102mkii & 202mkiii TAPE DECKS

deck, which records on both decks

DTC-A6 DAT RECORDER

£499

MDS-JE510 MINIDISC RECORDER

MZ-R30 PORTABLE MINIDISC RECORDER



HD-S200 PORTABLE DAT RECORDER



Panasonic

SV3800 NEW PRODUCT

£99

EPO/

MT50

MULTI-TRACKE

MT4X MULTI-TRACKER

1066 DUAL COMPRESSOR LIMITER GATE

DBX build on the success of their highly acclaimed dynamics process-

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

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!

which include all the essential acoustic recording processes in one

RRP £229

Excellent Sound & Build Quality Throughout the Range Full Feature Sets for Detailed Sound Control

Automatic Settings for Ease of Use When Required

Turnkey Pricing Means Even Better Value for Money

THE UK 4 TRACK CENTRE





ICES GUARANI



VS880 DIGITAL WORKSTATION



VIRTUAL STUDIO? **VIRTUAL** GIVEAWAY!

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

Each of the 8 tracks has 8 virtual tracks, allowing you to record several different takes, and then compare them afterwards, even if you've

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

New version 2 software not only allows automation data to be recorded directly to the hard drive for total integration, but also brings numerous new effects to the optional board, including COSM based mic emulation - make your SM58 sound like a U87! Existing owners can upgrade to version 2 for only £49.



To offer a completely integrated solution, we are bundling the VS880 with a 1.4 gig hard drive and mounting kit, and the FX board

have a combined retail price of £2238, but for a limited period only all this can be yours for only £1849!



 Digital Mixer with Full Automation Totally Integrated Solution

- Built in MIDI Sync
- 64 Virtual Tracks
- **Built in Effects**

RRP £2309

INCLUDES 2.1Gb HD, MOUNTING KIT & FX BOARD

PDR-04 CD RECORDER

Why master to DAT when you can master to CD for the same price? For the price of a budget DAT machine, we bring you this incredible deal on the Pioneer PDR-04.

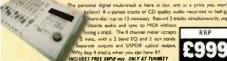
Record via either the analogue inputs, the optical or co-axial digital inputs, and get yourself a bonafide finished CD¹ DAT, CD or Mini Disc ID codes are automatically translated onto the disc, and recording can be stopped the same day. CD's are more durable and have a longer shelf life get all the airvantages of instant access, and impression on the same control of the same contro

RRP 1699 with your very own CD! Full function infra red rein included, 74 minute media £9.99 each, or £79 for 10

These will sell out quickly - order now!

PDR=05 ALSO AVAILABLE with sample rate conversion





D90 & 168RC RECORDING PACKAGE



£2199

Akai DR4VR £699	Fostex XR3£189	Tascam DAP1£1227
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Akai DR16 £3995	Fostex XR7£369	Tascam Porta03 MK2 £159
Alesis ADATXT £1650	PanasonicSV3800 £895	Yamaha MT4X £349
Fostex D5£679	Sony MZR3£279	Yamaha MT50£249
Fostex D80£899	Tascam DA20 £639	Yamaha MT8X £599
Fostex D90 £1295	Tascam DA30MKII £965	
Fostex DMT8VL £899	Tascam DA88 £1899	

03D Digital Console

Like the 02R, the 03D is a fully-automated digital mixing console set to have a large impact on the mixing market. With 26-inputs & 18-outputs the console features fast 32-bit internal digital audio processing, ver-satile analog and digital I/O configu-ration, new 32-bit onboard multi-effects processors with freeze (sampling) and guitar amp simula-tion effects, motorised faders, fader

and mute grouping, surround sound mixing, onboard automation, MIDI remote capabilities and much more. Call now for a Turnkey Professional brochure and a free trial!



02R Digital Console

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



PROMIX 01 Digital Mixer



STOP PRESS! NEW LOW PRICE ONLY AT TURNKEY

£1499

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MDMX4 DIGITAL MULTITRACK

high quality four track digital recording on an MD data disk. It also features the exclusive Track Edit system and a host of other functions that will revolutionise your concept of personal recording, and Sony's second generation data

compression algorithms give it a significant sound advantage over similar machines. The 10 input mixer (2 XLR's) has 4 busses, individual track outputs, 2 aux sends and 3 band EQ. Random access transport includes 11 point locator, jog-shuttle wheel as well as rehearsal and auto-punch modes. There's no need to leave a track spare for bouncing, and whole songs can be digitally copied forward for a 'safety' version. MMC and MTC compatibility for use with MIDI sequencers - you can even control it from your sequencer! MIDI Clocks are also supported for use with key-

board workstations and drum machines. Stocks are very limited on this exclusive deal - order now

HD MULTI-TRACK RECORDER



DR-16 HD MULTI-TRACK RECORDER

£359

CALL TURNKEY PROFESSIONAL ON 0171 240 403

E'S



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!

MOON!

NEW PRODUCT

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



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

PCP330 VOCODER



a vocoder anymore?" - well here it is, with a fantastic feature list, great sound qualty and a down to earth price. The carrier can be either an internal VCO or exter nal 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, carri er, vocoded signal and a special filtered version of the signal. Remember, this does n't only create robot voices, there are thousands of creative uses. and it's also ideal for processing drum loops.

Order now and own an instant classic

DIGITAL

PROBLEM SOLVERS In today's increasingly digital world, many people are still using their

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

Also in the range:

OP-CON: opecal to co-axial and vice versa	£69
PRO-CORL SPONF to AES/EBU and vice warsa with SCMS stripping	£129
D 4-2 COPY CON switcher with 1 optical 8-3 co-ax ins, 2 co-ax outs and SCMS stripping	299
SR44.1: converts almost any encoming sample race to 44 Hdriz (ideal for Profried) and non 44 I DATS)	£149
SRGW: sample rate conversion to 32, 44.1, 48kHz, with lock to external word clock	€249
Super Cleck Oriver: converts DigiDesign superclock to word clock and vice versa, 3 outputs	£129
Silent Audio Clock: converts Super Clock to word clock and vice verse with synchronous SPDIF signs	£129
ADAT Audio Clock: ADAT 9 Pm to word clock, Super Clock and SPDIF clock convertor	£129
ADAT Word Clock Synchronises: ADAT 9 Pin to word clock and Super Clock convertor, also send	s MTC
(synchronise your sequencer) with MIDI merg	£199
ADAT SPOIF Synchroniser: as above but with converts only to SPOIF £199	-

er of the above for full remote ADAT control from yo

VTP-1 DIGITAL

VCS1 COMPRESSOR

quality of the reverb alone would make it worth the price, but there's lots more: two simultaneous

1201 TRUE STEREO FX PROCESSOR

The 1201 is a full 19" rack unit, featuring true stereo 16 bit processing at 44.1kHz, with 64x oversampling convertors. The

effects are offered, from a choice of 33 including delay, chorus, flanging, tremolo and pitch shifting, 'vocoder', karaoke, 'lo-fi' and vocal distortion effects as well as various reverb types including reverse. If one of the 363 presets doesn't suit exactly then using the two parameter knobs will allow you to tweak the program until it

does, and the addition of 2 band EQ will further tailor the sound to your mix.

- 16 Bit 44.1kHz True Stereo FX Units
- Great Quality Reverb & Multi FX
- Vocoder and Mic Input on 1204
- Up to 512 Different Presets



1204 TRUE STEREO FX PROCESSOR The 1204 builds on the success of the 1202 by adding MIDI control, 100 extra user presets for storing your own edits, and

a two digit LED display. On top of this, there is also a rotary speaker effect, and a vocoder - a front panel mic input is even provided for quick and easy setup. RRP

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

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



COMPOSER WORKHORSE COMPRESSOR RRP £349

MIDIVERB 4 PRO QUALITY FX UNIT

ROTARY SPEAKER SIMULATOR

G5 SYNTH BASS PROCESSOR RRP £349 £89

Studio Ouad 4 CH. STUDIO FX PROCESSOR

Focusrite

GUARANI



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 charac- NEW PRODUCT

teristic. 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.

000000000

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!



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 NEW PRODUCT

reverse, input and output pads, separate gain and output level controls, true 48v phantom power, jack and XLR ouputs and dual VU meters. Bypass you desks mic amps and feel the quality!

Traditional exciters usually do a good job of brightening up

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.

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RP562 Stereo Exciter

the extreme top end, but can often leave NEW PRODUCT

ADB3 Stereo Direct Box

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PME4 BUY A PAIR FO

PARAMETRIC EQ



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NEW BOXED

E269

MP110 Direct Drive Mic Pre Amp



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4 POLE



MODEL 316 SEMI-PARAMETRIC EQ

SRV-330 REVERR IINIT

GREEN RANGE

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:

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L Audio

The Focus - 4 band parametric EO with fil-

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 compress sor 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

All 5 are on permanent demo at Turnkey.

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E01 Parametric EQ

TLA's range of outboard must be the best selling valve gear ever! Their classic warm valve sound, combined with the low

sound, combined with the low anoise 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 prine. The EQ1 is a dual 4 band (or single channel 8 band) parametric EQ - a high performance transformeriess pre amp is followed by four valve stages per channel, which provide a fine and gradual overdriline.

characteristic, and a frequency response which is virtually flat £499 from 20Hz to 40kHz. Limited quantities only at this price!

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MPX 1

ALEX EFFECTS PROCESSOR

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able price. We deliver a tested, working,

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

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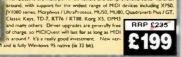
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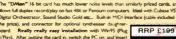
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HURRICANE IN YOUR PC?

99% of available sound cards use the oldfashioned "DMA" system of recording audio in order to be compatible with Soundblaster games. With the Pinnacle

and Fiji, Turtle Beach abandoned this system in favour of their proprietory Hurricane architecture. Basically, it gives you more tracks than

DMA on the same PC hardware, and leads to less driver conflicts.

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 convertors on both record and playback, 64x oversampling, and Delta/Sigma convertors. An on-board Kurzweil chip provides a top-quality set of synth sounds, which can be augmented with your own samples which can be mapped to a MIDI keyboard via the SampleStore™ control panel. (Up to 48 Meg of samples

can be loaded, depending on the size of SIMMs fitted). Create your own drum-kits, mix in breakbeats 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. PINNACLE

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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

NEW PRODUCT

Audiowerk8

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!

Virtual Multitrack Recorder

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 convertors for pristine sound quality. The card is on permanent demonstration in our exclusive Emagic PC. Call us now!

This is just the start of the good news though -

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AUDIO PC

NEW PRODUCT INC LOGIC **AUDIO MAC**

RAVE-O-LUTION 309 DANCE WORKSTATION

undoubtedly Quasimidi's best and most innovative product to date. Imagine the raw powerful sound quality of Roland's TR909 and TB303, give them 50 times as many sounds, add resonant filters to the drums, and you've still only got half the instrument that is the

QUASIMID

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).

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four part analogue style synthesiser, with 8 note polyphony, 4 outputs and superb 309 style realtime editing facili-Call for more details



JV1080

Roland



top flight sound quality and a huge range of useable sounds.

But expandability of the machine is where it really comes into it's ow over 10 different expansion boards which can be fitted (up to 4 ast 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 upharable price on the method istelf. Burnish and Gangle 18 and 18 and

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Roland

JV2080 SYNTH MODULE



The Roland JV1080 has been become the industry standard sound source for he

studios and professionals alike its supero sound quality, 64 note polyphor expandability were a winning combination.

Now the new JY2080 builds on that success by offering a giant editing screen, independent effects processors as well as reverly of delay and chorus, and not 8 of Roland's renowned expansion boards - the potential is virtually limitdess! Judging by the success of the JY1080, these will RRP C1

be in strong demand - call us no sion boards for only £499 extra!

DEEP BASS 9 B303 CLONE

MVS1 SOUND MODULE

RRP 2469

SC88-VL

PRICES (GUARANTE



BLUE MEANIE INVASION!

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

The analogue emulation market is hotting up with this exciting new release from Yamaha. Building on

the incredible success of the CSIx,

the ANIx is built on the same

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.

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 ANIx is sure

10 Note Polyphony Includes free Stand, Case & Headphones

to be an instant hit. Demand will far outstrip supply - get your order in early!

- 64 Note Polyphony as Standard
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NEW PRODUCT

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!

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It's the only authentic sounding TB303™ clone on the market, and it's got MIDI! IU rack with I 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

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NEW PRODUCT

MC-303 GROOVEBOX





The enduring popularity of the T8303, 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 lacif bass sounds complete with front panel filter controls and a whole host of other usable sounds (it's 16 part multi-timbrall). This box is an all in one dance music solution, and believe us, it sounds the business! limital sup-

music solution, and believe us, it sounds the business! Initial sup plies will be very limited, order now to avoid disappointment

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combines all the famous features of the original Microwave together with today's requirements for user

PULSE

MONO SYNTH



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 th Microwave II has 2 fully modulatable stereo outputs (configurable as 4 mono with panning). Tone generation comes from a powerful DSP generating wavetables, the 10 voices each feature two oscillators, 2 wave generators, a miser, two filters in series, a stereo amplifier, four envelopes, 2 LFOs, a modulation matrix with 16 slots and seven eral 'modifiers', more than enough to keep even the mos

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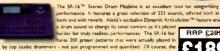
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K5000s **ADDITIVE SYNTH**

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different though with the KS000S, and reintroadditive synthesis. This has been tried in the past, but
has severely curtailed the possible results. The only
spontically confidence or the confidence of the confidence of the confidence or the confi

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XP-10 **MULTITIMBRAL SYNTH**

features like sound morphi nd you have the XPIO. Fu ieneral MIDI compatible

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The Prophecy is already a legend in its own litetime, and this includes a some makes it better value for money than ever. Virtual synthesis not only gives some makes it better value for money than ever. Virtual synthesis not only gives some makes in better value for money than a sounds from Moogs through ARP. great acoustic simulations, but also superb analog sounds, from Moogs th

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home studio setup often envolves a compromise between sound quality, cost, bass performance and portability. Now you can have it all with this once in a lifetime deal on the stunning Alesis Monitor 2's.

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Soundcraft's Spirit Studio desks revitionised the project studio market when they were introduced over 5 years ago offering sound quality and features only previously found on desks several times the order. Energy these these several times the order. eral times the price. Even then they we great value for money, but because Sounder have recouped their R&D costs, and because of

every channel, LED metering, fader reverse - the list is

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MTR transport control are a few of the features that put other project consoles to shame (no MIDI on LE versions).

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SM58 INDUSTRY STANDARD DYNAMIC MIC

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Based around the well-known Folio 12, and also Done souling 2

SPIRIT

FOLIO NOTEPAD PORTABLE MIXER



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FOLIO F1 NEW MIXER

FOLIO SX MULTITRACK RECORDING CONSOLE

27

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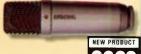
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Microtech Gefell

Large-diaphragm Capacitor Microphone

Microtech Gefell's first multi-pattern mic is graced with the kind of looks which could assure it classic status — as long as its sound lives up to its stunning appearance. PAUL WHITE lends an ear.

MICROTECH GEFELL

icrotech Gefell were one of the first East German mic companies to gain respectability, even before the demise of the Berlin Wall, and in recent years their manufacturing quality and design has improved enormously, to the point where they can now be considered a major player in the capacitor mic league. While they don't set out to rival the budget prices of some other former Eastern Bloc manufacturers, Microtech Gefell products are still very competitive given the quality on offer, and you only need to take a perfunctory look at the engineering quality to see that the company are turning out some really beautiful mics.

GOING TO WORK ON AN EGG

The UMT800 is a particularly elegant and eye-catching microphone, not least because of its huge, egg-shaped basket. Within lies a dual-diaphragm (using gold-sputtered PVC diaphragms), large-diameter capacitor capsule. designated the M7. This capsule is also used in the company's UMT70S and UM92.1S models, though the support circuitry is different.

Available in either matte black or satin chrome finishes, the UMT800 is designed for recording studio use, though it also has broadcast and soundtrack applications. The preamp is a

> solid-state, transformerless design and operates from regular 40V phantom power. Obviously, such a bulky mic needs to be mounted carefully, and you can buy either a swivel-end mount or a rugged elastic suspension as an option. The mic is shipped in a nicely made. foam-lined wooden case, and further optional accessories include a pop screen, windscreen, separate power supply and cable.

As you may have inferred from the use of a doublediaphragm capsule, the UMT800 is a multi-pattern mic offering five discrete patterns, which are selectable via a thumbwheel switch on the side of the mic's body. In addition to

omni and figure-of-eight patterns, there are also three widths of cardioid response to chose from: wide cardioid, cardioid. and hypercardioid. A recessed dual DIP

pros & cons

MICROTECH GEFELL UMT800 £1316

- Beautifully made and dramatically styled.
- · Sounds both warm and natural, with plenty
- · Switchable patterns and choice of mounting

 May not be sufficiently flattering for some users who expect large-diaphragm mics to have an obvious 'sound'.

Surramary
A very nice vocal mic that can also be employed in a number of general-purpose applications.

SOUND ON SOUND

"The UMT800 emphasises chest resonance nicely but still sounds extremely tight."

switch just below the pattern selector may be activated, using a pen or other pointed object, to bring in a 10dB pad and a low-frequency roll-off filter. Connection is via a conventionally wired XLR with gold pins, and the lower end of the mic casing has an internal thread to accept the swivel-end mount. The case itself is machined from solid metal but, unfortunately, there's no easy way to get into it to look over the circuitry. Disassembly requires patience and a screwdriver rather than the more usual unscrewing of the end. Acoustic foam is used inside the lower half of the grille, though at the top end, where the capsule is, the tough outer grille is augmented only by a finer mesh layer directly inside.

A look at the technical spec shows that the mic has a nominal 40Hz-18kHz frequency response, though there's still a significant usable range above 18kHz, and the frequency response plots show a slight lift in the 10kHz region, which helps to give the sound a little air without introducing harshness. Interestingly, the presence peak is most pronounced in omni

SOUND ON SOUND . October 1997

UMT800

mode, with a 5 or 6dB rise at around 12kHz. Sensitivity, at 13mV/Pa, is average for a mic of this type, with a quoted dynamic range of 121dB. Self-noise is a respectable 14dB (A-weighted), and in most respects the paper specification looks very typical for a large-diaphragm capacitor mic of this calibre. What the paper spec doesn't really tell you is what the microphone sounds like, because, like the vast majority of large-diaphragm models, the UMT800 gives its own unique interpretation of the sound being picked up.

TESTING TIMES

To evaluate the UMT800 fairty, it was compared to a number of leading large-diaphragm capacitor studio mics, and with vocal tests the results were quite revealing. Firstly, the apparent average sensitivity suggested by the spec sheet was confirmed—the output level was in the same ballpark as most of the comparison models. Tonally,

the mic did manage to deliver that large-diaphragm solidity and flattery, but in a very subtle way. Some mics known for their warm sound actually have quite a sloppy, uncontrolled bass end; the UMT800, in contrast, emphasises chest resonance nicely but still sounds extremely tight. I've also found that some of the more 'coloured'-sounding mics balance the bottom-end emphasis by adding a noticeable amount of top, and the result is a slightly scooped middle, which can make vocals seem a little recessed in the mix and can exacerbate sibilance in some performers. The UMT800 doesn't follow this pattern - the tonal balance stays even right across the spectrum, which has the effect of pushing vocals slightly forward, making them drier and more intimate. There's still plenty of real transient detail, but no artificial-sounding brightness. Not only does this help keep sibilance under control, it also makes for a smoother, more

natural high end that doesn't get fatiguing when you play back the recording at high levels. You really need to work with a given mic for a while, to find out what it's best at, and if you're looking for a mic to suit your own voice, be prepared to spend some time comparing models. From what I can tell of the UMT800, its apparently natural sound, combined with its subtle flattering qualities, should suit it to a wide range of voices and performance styles.

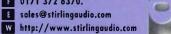
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Roland A33

76-note Synth-Action MIDI Controller Keyboard

If you need an easy-to-use controller keyboard Roland's latest mid-ranger master could be the one for you. NICHOLAS ROWLAND takes a spin down the A33.

aster keyboards tend to come in two distinctive flavours. The first is cheap, light and small, enabling its owner to have a meaningful, but nevertheless low-level musical relationship with a computer soundcard or similar. The second type is expensive, big and very, very heavy — consisting of Steinway

MIDI lead at, this keyboard is essentially optimised for use with GS sound modules, Roland's proprietary, extended version of General MIDI. That explains why, although it makes no sounds of its own, the numeric dataentry buttons are also labelled with the names of GM/GS sound banks, and, for that matter, why it has dedicated on/off controls for chorus and reverb. This is darn useful if you possess a GS/GM module, particularly those various models, designed for computer use, that have no display. Conversely, if you're not a GS Joe, these features are ever so slightly redundant.

Physically, the A33 is a well-turned out package that oozes quality. The keyboard itself has a firm, responsive action which is pleasant to use. And all those extra notes! It's like being allowed to run free in the big boys' playground. [Steady on there — Ed.] The keyboard is

ROLAND A33 E39 Free Lots of notes. Nice keyboard action. GS-friendly. Too GS-friendly. Inflexible in the long-term. Summary The A33 is especially recommended if you need 76 notes, as it's a shade cheaper than the nearest competition (though it lacks weighting), or simply need a well-built controller for your GM/GS sound module. SOUND ON SOUND



grand keyboards welded to the bridge of the Starship Enterprise and offering enough technology to subjugate entire galaxies of MIDI modules. In terms of size, specification and price, you could call the Roland A33 a bit of an in-betweenie. For example, its six-octave, 76-note keyboard makes it something of a player's instrument, although the keys aren't weighted like most professional controller keyboards. And while the MIDI spec is relatively straightforward, the A33 has a couple of tricks up its sleeve which make it a more attractive proposition than the handful of other controller keyboards in this fair-to-middling price range.

GENERALLY SPEAKING

I should point out now that, while it will communicate with anything you can shake a

transposable up or down by up to two octaves. giving a total range of nearly 10 octaves. You've probably spotted one of Roland's combined pitch-bend/modulation controllers lurking on the left there. Personally, I find these more intuitive than trying to manipulate two separate wheels. The modulation axis can be switched to transmit aftertouch, which the keys can't. However, it goes without saying (or maybe it doesn't) that the keyboard is velocity sensitive, with userprogrammable sensitivity. Round the back you'll find a socket for the optional DC adaptor (the A33 will run on batteries as well), jack sockets for an optional sustain switch and expression pedal, and the all-important MIDI In, two MIDI Outs and one MIDI Thru. One neat feature is that each MIDI Out can be separately switched on or off from the front panel. Despite the lack of any display, the keyboard is a breeze to set up and edit, primarily because there are plenty of buttons available to help — none of this using the keys of the keyboard to tap in program number and the like.

MAD ABOUT MODES

There are three keyboard modes: Upper, Lower and Split. The Upper and Lower sections can either be used separately (with a programmable spread across the keyboard) or combined together to create Layered patches. Split mode divides the keyboard into two sections, normally with a default split point of C4 — though, again, this is user-programmable. MIDI channel, octave shift, pitch-bend/modulation on/off, sustain on/off and expression on/off can be set

separately for each section. Any MIDI controller from 0-95 can be assigned to the data-entry slider, allowing you to remotely control functions such as volume, pan, reverb and chorus send level, and so on. However, since the A33 isn't equipped with a display which allows you to monitor data when transmitting it, it's not suitable for any operation involving Registered and Non-Registered Parameter Numbers.

The A33 also features a start/stop button for an external sequencer. Here you can make use of the A33's in-built MIDI Clock generator, with bpm (beats per minute) programmable via the data-entry slider. As an alternative the keyboard will re-transmit any MIDI clocks received via its MIDI In socket through both MIDI outs, having first merged it with any other outgoing MIDI data. Having set up your complex patches, you can save them to one of 32 user memories, allowing you to reconfigure your MIDI setup at the touch of a button.

VERDICT

Taken at face value, the A33 scores highly enough, particularly if you're looking to partner it with a GM or GS sound module. It's solidly built and attractively presented, and even though they may not be weighted, those 76 notes are ideal for keyboard players who like to stretch out, both physically

"Despite the lack of any display, the keyboard is a breeze to set up and edit, primarily because there are plenty of buttons available."



and musically. My only difficulty with the A33 is knowing that for the same kind of money there are now keyboards around (of the 'home' variety, admittedly) which offer comparable levels of external MIDI control, with the advantage that they also produce sounds. What's more, to get the most out of the current wave of sound modules, you need far more than an ability simply to trigger notes and change patches. It all leads me to wonder whether inbetweenies really make good long-term investments. However, if you know you're not likely to want more than the A33 offers in the foreseeable future, it's a cost-effective controller that's comfortable to use.

- £ £399 including VAT.
- A Roland (UK), Atlantic Close, Swansea Enterprise Park, Swansea, West Glamorgan, SA7 9FJ.
- Brochure Hotline: 01792 515020.
- 01792 575020.
- W http://www.roland.co.uk





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SOUND ON SOUND . October 1997

Oz Audio Q-Mix HM6

Headphone Amp

If you want to get on with recording, rather than arguing about who needs what foldback, why not let the musicians mix their own?

MARTIN WALKER finds he's all mixed up...

s Paul White said back in the April issue of SOS: "For years you never see a headphone amp, then a whole bunch come along at once." He was referring to the Rane Mojo MH4, and the Samson Q5 reviewed a month previously. Well, the ranks have now been swelled still further, with the arrival of the model under review here, the O-Mix HM6. Fortunately this one has a rather different flavour, since it features not just the mono or stereo feeds of the previous two, but up to six inputs. The excitement doesn't end there, since these six (a main stereo feed, normally taken from the stereo mix of your main desk, and four additional mono feeds) can be individually sub-mixed into each of the six stereo headphone outputs provided. There's even an effects send section (one stereo and four mono controls) which emerges from a mono socket on the back panel.

THE PACKAGE

The HM6 (Headphone Matrix) is both butch and dinky. It comes in a small but heavy steel case (9.5 x 8.5 x 2 inches), incorporating a mains PSU with red LED indicator — so there's no wall-wart — and even with six phones leads pulling in different

OZ AUDIO Q-MIX HM6 £295

Pros

• Multiple mixes.
• Effects send/return.
• Sturdy build quality.

CONS
• 160 milliwatts may be insufficient for deaf drummers wearing high-impedance phones.

SUMMARY
A sturdy, versatile unit that may be the only headphone amp you ever need.



Each of the six channels has an overall level control at the bottom (for the main stereo mix), four individual controls to add the four mono inputs (A, B, C, and D), and an effects return level. On the back panel, the headphone outputs are on standard stereo jack sockets, as you'd expect. Beneath these are the effects

down the side (I wish all knobs were made like this).

"The Q-Mix is ideal in a studio environment."

send (balanced at +4dBu) and the inputs: four mono, a pair for the stereo main input, and another pair for the L and R effects returns. All inputs are balanced and accept levels between -10dBV and +22dBu.

THE TEST

The Q-Mix outputs are rated at 160 milliwatts into a 60Ω load, and are designed to accept any headphone impedance from 8Ω to 2000Ω . This sounds like peanuts, but most modern phones are very sensitive. I plugged in a selection of signals, from solo kick drum to full band, mixed in some live keyboard and guitars, and iced the cake with some external reverb. The sound quality was fine: I got more than enough level for my ears through both Sennheiser HD480 II phones (60Ω) and an ancient Koss closed-back set with 300Ω impedance. I did manage to get some slight distortion with solo bass guitar before my head started to ache, but that might have been my eardrums rattling in sympathy. Most people

should be happy with the maximum levels attainable, but I would still advise you to check with your own phones if their impedance is more than a couple of hundred ohms.

THE VERDICT

The Q-Mix is ideal in a studio environment, where you can connect one stereo and four mono feeds from your desk through to the live recording area. Plug in the Q-Mix at the other end, where the musicians are playing, provide them with up to six pairs of headphones, and then let them each sort out their own personal foldback mixes. It's also useful live — send any common signals (kick drum, or overall drum mix) to the stereo input, and then add vocals, bass, guitar or whatever you need to the other four, to achieve six separate on-stage monitor mixes. These could, if necessary, be sent on to power amps and wedge monitors.

I like the Q-Mix. Its overall styling is strangely reminiscent of that of a certain mixer manufacturer (whose name rhymes with 'Jackie'), and even Oz Audio's address seems to be in the same area. Hmmm... Anyway, it's surprising that there aren't more products like this one available — anything that sorts out arguments is a good thing in my book.

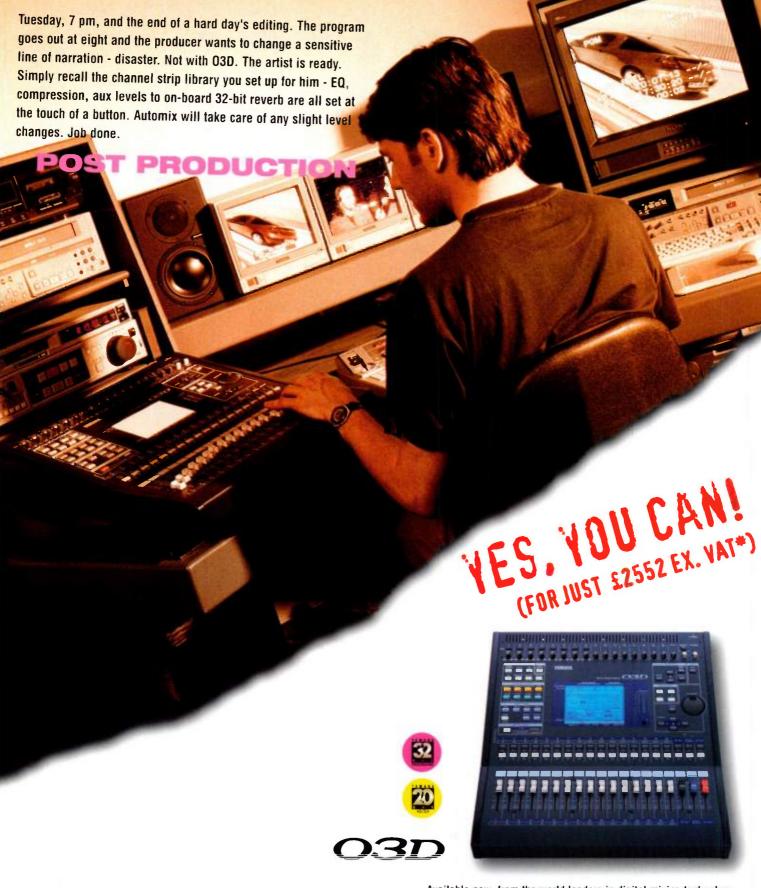
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KRK RoK Bottom

Subwoofer

PAUL WHITE plumbs new depths with KRK's recently introduced active sub-bass package, designed to turn their nearfield monitors into full-range systems.

he idea of combining nearfield monitors with a single sub-bass cabinet to provide full-range monitoring for small studios is very seductive, and done properly it can work exceptionally well. The theory is that at very long wavelengths, sound doesn't convey as many stereo clues as it does at higher frequencies, so if the bottom octave or so of the spectrum is in mono, nobody should really

The next problem is to decide how to power the sub-bass speaker. Should it include a passive crossover so it can work off the same amplifiers as the main monitors, or should it have its own power amp and active crossover? Passive systems can and do work, but you can't feed a single mono speaker from a stereo power amp unless it has a fancy double voice coil, so you have to design a cabinet with two drivers and passive crossover components. With an active system, the crossover characteristics can be made tighter, less power is lost, and you can get by with a single bass driver. That's the road KRK have taken with the Rok Bottom, a substantial mono sub-bass enclosure containing a 13-inch woofer with a roll surround.

ANATOMY OF A ROK

In keeping with other KRK designs, the Rok Bottoms are smooth with rounded corners and a textured paint finish. The MDF cabinet measures 18.75 x 17.75 x 21 inches, though it tapers towards the top, making it look like something from the *Stargate* film set. The shape, combined with a weight of 85lb and an

absence of handles, makes lifting the unit about as easy as holding a hundredweight bar of soap!

Dual bass ports provide cabinet tuning, and a solid-state power amplifier rated at 140W delivers the power. An integral four-second delay inhibits power-on thumps, and the amplifier includes DC output fault protection, high-current limiting and thermal shutdown. A gain control, detented at unity gain, sets the sub-bass drive level; a small toggle switch enables the sub-bass to be turned off.

The Rok Bottom is specifically designed to be used with KRK's existing nearfield monitors, such as the K Roks or the smaller model 6000s, both of which were provided for the purpose of this review. All signals are fed first into the Rok Bottom, which has three XLRs for left, right and centre signals. The bass end

of the spectrum is then filtered out, combined into mono and passed on to the internal amplifier to drive the woofer. In order to remove the low bass being fed to the nearfield 'satellite' system, there's a switchable high-pass filter in each channel, after which the line-level signals reappear at three more left/right/centre XLRs.

Pros & COIIS KRK ROK BOTTOM £1639 Pros Easy to install and use. Includes centre connection for use in surround monitoring or playback applications. Reasonably compact considering its performance. CONS As with all separate systems, getting the correct balance with the main speakers is important in order to achieve accurate performance. SUMMARY A practical, compact and effective way to add another octave of bass to your existing KRK monitors.

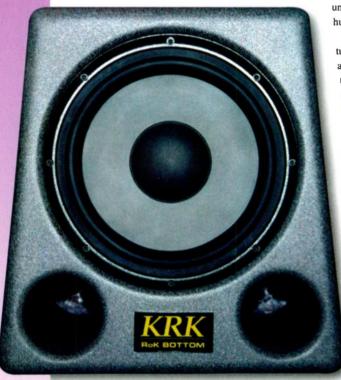


We tested the Rok Bottom with KRK's model 6000 nearfield monitors.

"The secret of successful sub-bass is not to use too much of it."

The centre connections would only be used in a surround system with a centre front speaker — for regular stereo monitoring, only the left and right would be used. Of course, a power amplifier is still required for the main speakers, unless they are active models.

The frequency response of the Rok Bottom



notice. Certain audio gurus have argued the contrary, stating that stereo separation is still important at low frequencies, but in a practical monitoring environment, mono sub-bass systems have been demonstrated to give perfectly acceptable results as far as the majority of listeners are concerned.

is around one octave, covering 32-60Hz where the crossover frequency is set to 60Hz. The low-pass filter feeding the woofer section has a steep 24dB response, while the high-pass filter feeding the main monitors has a gentler 12dB/octave response.

All the electronics are mounted on a sub-assembly, the main panel of which is sited directly below the amplifier heatsink on the rear of the enclosure. An EC connector takes mains into the unit; there are the six XLR inputs and outputs for left, right and centre; and the two toggle switches mute the sub-bass and switch out the satellite high-pass filters. That leaves only the detented sub-bass gain control and a couple of status LEDs to tell anyone who happens to be behind the cabinet how the amp is coping with life. Obviously these might have been better placed on the front panel, but it could be argued that, given the places where people stick sub-bass speakers, the lamps would probably be invisible no matter where you put them.

IMPRESSIONS

The secret of successful sub-bass is not to use too much of it. Adding just enough sub-bass to fill in that lower octave without swamping the music adds all the weight you need to feel TR909 kick drums, bass synths and acoustic drums, but without changing the inherent sound-character of the monitoring. Using the

THE BOTTOM LINE

PRE-AMP SECTION: L, C, R summing input

to Woofer with switchable on/off high-pass filter to satellite speakers.

OWER: 140W maximum

into 8Ω.

DISTORTION: Less than 0.05%

(THD or IMD).

output.

FREQUENCY RESPONSE:

NOISE:

RESPONSE: 32-60Hz (±0.5 dB).

CROSSOVER (60Hz): 24dB/octave low-pass,

12dB/octave high-pass. 18.75 x 17.75 x

DIMENSIONS: 18.75 x 17.75 x 21.0 inches (h x w x d).

WEIGHT: 85lb.

Rok Bottom in this way really firms up the overall sound, but still leaves it sounding tight and well controlled. It also doesn't seem too critical where the Rok Bottom cabinet is placed; for optimum results, though, it should go mid-way between the stereo speakers and be about the same distance from the listener. As you'd expect, turning the sub-bass up too high makes your system sound like one of those ridiculous cars with high-power audio systems that use the occupants as passive

Summing up, I think that KRK have come up with a good balance between size and true sub-bass. So many alleged sub-bass systems go down no further than the bottom end of a decent medium-sized pair of 2-way hi-fi speakers, but the Rok Bottoms go right down to 30Hz, so the only things that will escape their attention are the fundamentals of very low organ pedal notes, and earthquakes. The tonal balance when they're used with other KRK monitors is pretty seamless, and siting doesn't seem at all critical - so in a small room you have some flexibility about where to put the unit. Furthermore, the low-pass filtered output takes some of the low-end strain off the main monitors, so the system is likely to be able to work at higher levels without distortion. If you're a KRK user and want to sink to new depths, you could do a lot worse than check out their Bottoms...

£ £1639.12 including VAT.

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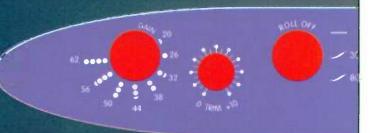
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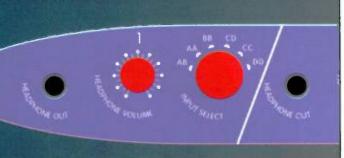
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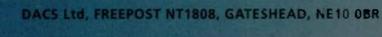
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Aardvark Aard

Master Digital Audio Sync Generator

Got the jitters? Aardvark's external sync unit could be the answer. MIKE COLLINS investigates.

any of today's project studios will be using a combination of digital equipment: a Yamaha 02R mixer, perhaps; Digidesign Pro Tools or Sonic Solutions recording and editing systems, outboard digital signal processors and converters, and other digital audio sources and destinations.

All this equipment has to be synchronised to one master clock source, and normally it can be slaved to a sync signal that's either embedded in the digital audio signals, or supplied as a separate signal. The internal clocks used in these systems are adequate when the devices are used standing alone, but when they're linked together, clock-timing variations known as 'jitter' can arise, and these may cause noticeable degradation of the audio quality.

To achieve the highest sound quality with digital audio, the master clock in your system — to which all the devices are locked — should, ideally, have a jitter rating down in the picoseconds range. Most of the equipment

you use is unlikely to achieve such low-jitter performance, though: its jitter will normally be measured in nanoseconds or even microseconds. So for rock-solid sync you need to use a high-quality external sync unit such as the AardSync II.

FEATURES

The AardSync II is supplied as a compact black box measuring 7" by 9" by 1½"; it uses an external 12V power supply. With the rotary switch on the front panel, you can set the sampler rate to just about anything you're likely to come across between 32 and 50kHz, including the pull-up and pull-down frequencies needed for film and video transfer—and an option is available to provide double these rates if you need to work at the new 88.2 and 96kHz sampling rates. Indicator LEDs are provided to show video input, video frame rates and system lock; there's a front-panel On/Off switch, and an associated LED to show when the power's on.

The back panel has two XLRs for AES/EBU sync output, three BNCs for word-clock output, and one BNC for the Digidesign Superclock output used by Pro Tools and Avid systems. There's also a BNC for video sync input: the AardSync can be locked to PAL/SECAM's 50 frames per second or NTSC's 59.94 or 60 frames per second, or to video black-burst signals.

"The synchroniser features very fast lockup to SMPTE timecode using proprietary digital techniques."



SYNC'ING TO VIDEO

The synchroniser features very fast lockup to SMPTE timecode using proprietary digital techniques. To sync to video, you could just feed a video signal from your VCR to the Aardsync and lock to that, but the timing of the video signal would vary because of wow and flutter in the VCR transport — so, ideally, you need to use a video black-burst signal from a house sync generator and lock both the VCR and the Aardsync to this. A similar situation applies if you want to use an analogue multitrack recorder and have this synchronised to your digital audio. Typically,



Sync II

one of the audio tracks on your video recorder or audio multitrack will contain SMPTE timecode, which you can feed to a SMPTE/MTC converter connected to a personal computer. On the computer, you may be running Pro Tools or some other digital audio workstation, possibly with a MIDI sequencer as the front end. The software on the computer will synchronise to the MIDI Timecode signal, but the digital audio in the Pro Tools system still needs a sync signal to

" the ultimate timing reference for everything in your studio..." keep the audio locked to the same clock source as the tape-based machines. These machines may also need additional machine synchronisers to vary the speed of the transport motors, so that they keep in step with the video frames coming from a house-sync black-burst source.

In case you were wondering, a black-burst video signal is simply a video signal with no picture content - just the timing signals, to which you can synchronise. Such a device is often referred to as a 'house sync' source because these devices are typically used by video facilities 'houses' when they need to synchronise several video sources for editing or broadcast. Conveniently, a video black-burst board is available as an option for the Aardsync II; with this, you can make the Video BNC and one of the wordclock BNCs output video sync signals, which you can use to sync a VCR and an analogue audio multitrack recorder.

CONCLUSION

If you're new to the issues discussed here, you may not have realised how important it is to use the highest-resolution clock source for best results, or have appreciated that all your digital devices (along with any MIDI and audio software) need to be locked to a common clock. Also, starting your video, analogue and digital audio and MIDI from the same SMPTE location doesn't guarantee that all this equipment will stay in sync!

This is where the AardSync II enters the scenario - acting as the ultimate timing reference for everything in your studio, whether it's digital audio, analogue audio, video or MIDI.

Highly recommended!

- £ £1675; oversample option for 88.2/96kHz £585; universal video generator for black-burst house sync £585. All prices include VAT.
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organ

THE HISTORY OF THE HAMMOND

In these days of synths that stay in production for just a couple of years before being discontinued, respect is due to a keyboard design that's survived more than half a century of changing musical fashion and is still going strong. Hammond-lover ROD SPARK pulls out all the stops to bring you a personal organ odyssey.



ince my childhood there's always been a sound I loved but never managed to identify. I had a faint memory of hearing this sound in theatres and cinemas, but after playing guitar for a good few years in a band, I started coming across it again in '60s soul and jazz songs. At long last I discovered what it was: the Hammond organ.

These days, the mention of a Hammond is as likely to conjure up pictures of Blackpool pleasure beach as it is Jimmy Smith in full R&B flight. Cast aside the memories of Peter Fenn playing the Sale of the Century theme (that was actually a Yamaha anyway!) and read on. Hammonds play a much bigger role in modern music than the cheesy sound (that's probably a Farfisa anyway) playing in the background while you practice your double axel at the local ice rink.

QUICK ON THE DRAW(BAR)

My first Hammond was an X5, a portable model made by the Japanese in the late '70s. We called it a Hammondo. This was a very exciting instrument for me, having two decks of keyboards, a pedal board (something I've never used on a Hammond and never will, thereby omitting any mention of it from this article!), and drawbars giving almost infinite variations in sound. The drawbars actually emulate the pipes on a church organ, which is the job the Hammond was originally designed to do. They match up to the lengths of a church organ pipe and supposedly give the same sound —pulling out the lower drawbar produces a deep sound similar to the largest church organ pipe.

In reality, the drawbar controls the level of harmonic or sub-fundamental introduced into the sound. The white drawbars are octave transpositions, the black ones are for third or fifth frequencies, and brown drawbars give the octave sub-fundamental and its third harmonic. If you don't understand this, don't worry - I don't either; I just read it somewhere once! All you need to know is that these drawbars allow you to carve out your own trademark sound, which is something I'm still working on.

The classic jazz organ setting (as used by Hammond supremo Jimmy Smith) is obtained by pulling out the first three drawbars and flicking the percussion switches for soft volume, third harmonic and fast decay. For the classic Hammond track 'Green Onions', Booker T used the same setting, but with the fourth drawbar pulled out too. Jon Lord does the same but prefers the percussion set to second harmonic. Many other Hammond players just pull all the drawbars out. No matter what, you'll still produce a unique sound, as every Hammond, even models from the same series, sounds different to its brothers and sisters.

ALL HAMMONDS ARE NOT CREATED EQUAL

Meanwhile, back at the main storyline... the X5 had a great sound but wasn't the best I'd heard. I was soon to learn that this was a solid-state Hammond. Early (real?) Hammonds have a generator which runs at 1800 revs per minute and drives a number of tonewheels (96 on a C3/B3, less on other Hammonds). These are small metallic discs, about an inch and a quarter in diameter, with high spots which spin past a system of electro-magnets, creating an alternating current corresponding to the equal temperament scale. This tone passes through a filter and can be controlled by the keyboard. Each key presses down on nine contacts which relate to the drawbars. All that's left is to amplify the signal and play through a speaker. My X5, however, didn't have a tonewheel and so wasn't authentic enough. It had to go!



A very rare picture of the tonewheels. The edges are painted orange to prevent corrosion.



"The drawbars actually emulate the pipes on a church organ, which is the job the Hammond was originally designed to do."

I then managed to get hold of a T100, which was also a fairly modern Hammond, having been produced around 1967. However, it looked more like the real ones that proper bands used than the Joe 90 effort I had before. The T100 was a spinetstyle organ — basically an upright box with a bit sticking out near the top where the keyboard is! Take a look at the picture above to get my drift. It also had a spring reverb, giving it a great crashing sound when I threw it around. (I made up for my lack of playing ability by performing neckbreaking stunts on it instead.)

After a while, I began to wonder why my organ didn't sound as good as the classics - apart from the obvious fact that I wasn't very good. It was then that I first met Graham Sutton, who had been a demonstrator for Hammond UK in the '60s and '70s. He told me all about the Hammond Organ to

A HAMMOND TIMELINE

1935-38: Model A organ (the first!). 1935-38: AB (as model A, in B-series cabinet). 1936-42: BC (as AB, plus chorus, extra generator). 1938: B-A (as BC but could also be played with rolls of paper, similar to a player piano). 1939-42: C (as AB but with C-series cabinet). 1939-42: D (as model C but with Chorus). 1939-42: Novachord (72-note poly synthesizer). 1940-48: Solovox (3-octave valve-based monosynth). 1941-44: G (built for US Government and found in forces recreation halls. As model D but with reverb). 1948-51: M (home-style spinet with tonewheel generator, internal amp and speaker. Drawbars only,

1949-54: B2 (as B3 but without percussion). 1949-54: C2 (as earlier CV from 1945, but with

no presets of any kind).

additional controls for vibrato on either/both manuals, and for 'normal' or 'soft' overall volume). 1951-55: M2 (similar to M, above). 1955-74: B3 (a big box on four legs). 1955-74: C3 (B3's innards in C-type church case). 1955-64: M3 (similar to M, above). 1959-65: A100, 101 and 102 (as C3 but with homestyle console. Had built-in sound system and reverb). 1961-68: M100 (home-style spinet with internal amp and speakers).

1964: Hammond UK set up. 1965-72: X66 (non-traditional Hammond console organ with top octave tonewheel generator). 1965-74: H100 (a biggie with all the trimmings. Mixed valve/transistor circuitry).

1967-72: L100 (spinet model with tonewheel

generator and non-scanner vibrato). 1967-75: X77 (49-note arpeggiator, stereo reverb, variable reiteration and harp sustain). 1968-75: T100 (transistor spinet organ, vibrato, repetitive percussion voices, reverb). 3rd July 1973: Laurens Hammond dies. 1979-80: X5 (portable solid-state, single manual. Made by Nihon Hammond, who licensed the Hammond name in 1970). 1986: Hammond finally go out of business. 1987: Hammond Suzuki buy Hammond name and start to make XB range (The Organ Company of America had previously taken over the spare parts and servicing of original Hammonds).

NB: Hammond made organs with different finishes, so many models had relatives in the same family.

The History of the Hammond

▶ end all Hammond organs — the father of them all, the C3 (or B3, which is the American version — exactly the same Hammond but with four legs instead of a solid body. The C stood for Church, and the B was for the home). I had to get one! Unveiled by Hammond in 1955, it had made its mark in jazz

"The drawbars allow you to carve out your own trademark sound."

circles by 1958, courtesy of the great Jimmy Smith, Jackie Davis, Fats Waller and Wild Bill Davis.

While down in Milton Keynes rehearsing for the UK version of The Who's *Tommy*, I popped in to see Graham for a chat and rather recklessly left with a C3. It was split into two to allow for easier carrying (although easier isn't the word that anyone who's helped me carry it has ever used) and was the bee's knees, *the* big boss sound. There was no messing now. This wasn't a poxy wee synth — this was a man's machine.

BEFORE THE B3

The C3 and the other tonewheel Hammonds (the T500 was the last) were discontinued in 1974, due to mounting costs, and would be uneconomical to produce these days, due to the man-hours involved. Although he owned other, earlier Hammonds, Georgie Fame managed to get one of the last C3s off the line before production ceased. This was the end of an era which began in 1934 with inventor Laurens Hammond. At that time he was running The Hammond Clock Company of Chicago, though he had previously invented collapsible bridge tables and would later

dabble with missile systems. Mr Hammond became interested in the Cahill Telharmonium, a late 19th-century instrument employing rotary generators to create electrical impulses, which were turned into sound by way of telephone receivers. The idea was to distribute sound over the telephone network, but this was soon abandoned because of the machine's weight (apparently it occupied several rooms) and complexity.

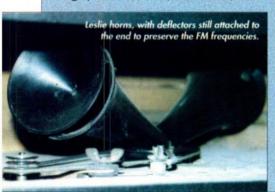
Nothing daunted, Laurens took the idea of the rotary generators and created a portable (for its day) organ. The 'Model A' Hammond organ was patronised by no less a personage than Henry Ford, who became the first buyer. The second model off the production line was presented to the then President of the USA, Franklin D Roosevelt, with George Gershwin being another early buyer. The model B, B3, C3 and M100/L100/T100 series all followed, along with countless other models (it would get very boring if I listed them all here) and since then many famous keyboard players have fallen in love with the Hammond. Players such as Georgie Fame, originally a jazz pianist, Jon Lord of Deep Purple, originally in the very hip combo The Artwoods, Keith Emerson of ELP and The Nice, well known for their banned version of 'America' and the abuse he gave his instrument.

SOMETHING GETS IT STARTED...

If you ever come across a Hammond, perhaps in a studio you might be recording in, chances are you won't even be able to get it started! Not content with just having an on/off switch, the earlier Hammonds had an ignition-like switch to wake them up. One switch, helpfully labelled 'Start', needs to be flicked and held for 10 seconds (which is usually where I start praying that it will work). Then, keeping the

POWER HUNGRY

One interesting thing about Hammonds is that they should never go out of tune! The generator is set to run at the correct speed when it is provided with a 50Hz cycle power rating. This is the standard for UK mains power. In the USA the standard is 60Hz, so Hammonds are set to work off that. This is great for the majority of gigs, but can turn into a nightmare for outdoor gigs. When I first got my C3, I played an outdoor gig with it the very next day. Every second song or so, the Hammond would cut out and I'd have to restart it. The Hammond was taken straight back where I got it (at midnight!). After several hours, Graham Sutton, the



vendor, could find nothing wrong with it, so I explained again what had been happening. "Ah!", he said, "an outdoor gig, with a power generator instead of mains". The power generator had occasionally been running below the 50Hz I needed, so the Hammond had cut out. All other equipment on stage was unaffected, as no-one else's gear was relying on straight 50Hz power, and transistors have a much wider tolerance. Since then I've played a number of outdoor gigs when the power from a generator has fluctuated, and the result is a variation in the pitch of the organ. If the power is 51-52Hz, the Hammond sounds sharp. It's very annoying, and applicable to all the big tonewheel organs.

At the same gig where the power problem first came to light, I was lucky enough to hear my Hammond being played by the keyboard player in the support band. The Hammond sounded awesome. This was the sound I was after, and I was dying to get on that stage and let rip. I wasn't prepared for the sound that greeted me when I got there. It just wasn't the same. This has happened to me on a number of occasions since, so I stopped worrying about it and put it down to miking techniques. Not so long ago, though, I discovered that Leslie cabinets give out AM and FM frequency components (providing that deflectors are



still fitted onto the ends of the Leslie's treble horn). The Amplitude Modulation is apparent beside and some distance away from the Leslie. The Frequency Modulation, however, doesn't show up until you're a few metres away from the cab. As FM is much more pleasing to the human ear than AM, this explains why, when you're standing close to the Leslie (such as when you're playing the Hammond), it doesn't sound as nice as it does out front to the audience — who are hearing the full effect. This knowledge is essential for a Hammond player's confidence and well-being!

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▶ Start switch held, you flick the 'Run' switch; this should start the Leslie horns spinning, providing a Leslie is connected). Hold the Start switch for a further 5-10 seconds and then let it go. Following a worrying, confusing and quite comical clunking, a whirring of wheels, a grinding of gears and a rumbling beneath your hands, Kazoom! The Hammond should now be ready to play.

Although all this might sound like a clever way of preventing unauthorised hands from playing your instrument, holding the Start switch sets the Hammond's generator running and allows it to reach the correct speed for those tonewheels. The Run switch is actually what powers everything



The Start and Run switches, plus percussion controls.

else up. If the power is interrupted, even for a second, this procedure must be repeated, as the generator will wind down.

Other knobs and switches to play with on most Hammonds include 'Percussion', which I mentioned earlier. This isn't for adding a naff Bossanova rhythm track. It lends attack to the top elements of the sound and reinforces either the second or third harmonic, producing the familiar 'chink' sound common in Hammond-rich tracks.

Vibrato is a common effect present on most Hammonds. While vibrato isn't everyone's cup of tea, the C3 (Chorus 3) setting on the B3 and C3 is particularly nice (if working properly. After 20 years or so, the Vibrato unit really needs a good overhaul to stop it detracting from the sound rather than enhancing it).

Some of the later, 1970s transistor Hammonds also had rhythm units, which supposedly emulated a drum kit. Some Hammonds (such as my old T100) also had spring reverb. Originally invented by Hammond for their Church organs, this was so successful that Leo Fender bought the idea from Hammond and made it a feature on his range of guitar amps.

Your choice of Hammond may be dictated by the music you plan to play with it. The 'big' Hammonds, such as the C3 and B3 (full bodied 'console' organs, as opposed to 'spinet'-type models) are usually regarded as the classic Hammonds because all the famous players used them. Two drawbacks with them, however, are the fact that they're so big and heavy (expect to need four people, lifting a corner each) and the fact that the generator requires a precise 50Hz power rating, which I'll explain later. The spinet-style Hammonds, such as the L100 and M100, are smaller, but they can still give the classic overdriven sound — and even if they don't, the amps can easily be tweaked to produce the desired effect.

YOU SPIN ME RIGHT ROUND

Many Hammonds don't have their own speakers, and produce sound instead through the famous Leslie cabinet, which was invented by Don Leslie, quite some time after the Hammond was first invented. The Leslie cab was originally designed as a sound modification device rather than a 'hi-fi' speaker, which partly explains why putting anything other than an organ or guitar through it (Hendrix did the latter quite a lot) always sounds crap. The only exception is, perhaps, singing through it, which produces a nice megaphone effect. Minus the speaker, Del Amitri put most of their vocals through a 145 model Leslie amp for warmth.

The Leslie looks like a chest of drawers and has a 40watt monophonic tube amplifier, an 800Hz 16Ω passive crossover, a rotating treble horn, and a rotating bass speaker (at least, the classic 145, 147 and 122 models do). It can produce two distinct sounds: the 'Chorale' effect when the speakers rotate slowly, and the 'Tremolo' when they spin quickly. There is actually a third effect that can be coaxed from the Leslie: if you disconnect the slow motors (either by pulling the slow-motor connections out or by using the small black Leslie brake accessory plug), you can stop the rotors. Switching the Leslie from slow (which will now actually be stop) to fast makes the difference in sound much more exaggerated, and also allows the vibrato and chorus on the Hammond to shine through and sound much sweeter than when the Leslie is on the Chorale setting.



A 147 Leslie cabinet, mechanical forerunner of Dr Who's TARDIS.

RECOMMENDED LISTENING

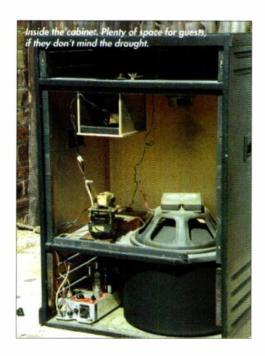
ALBUM

- . Jimmy Smith: The Sermon
- . Jimmy McGriff: Pullin' Out the Stops
- James Taylor Quartet: Wait a
 Minute
- Groove Tunnel [yes, this is Rod's own band! Ed]: Liven Up!
- . Brother Jack McDuff: Screamin'
- The Artwoods: 100 Oxford Street
- The Small Faces: The Small Faces (Green Circles)

SONGS

- . Jimmy Smith: 'The Cat'
- The Nice: 'America'
- Deep Purple: 'Hush'
- . Hardin & York: 'Drinking My Wine'

Anything by Brian Auger Trinity, Booker T & The MGs, Groove Tunnel, Blue Note.



Unfortunately, the Leslie and Hammond usually take up half the space in a tour bus and are a roadie's nightmare (they can weigh a good 500 pounds).

SOUND STUFF

I've been cursed many a time for the weight of my rig, but in my defence insisted that the Hammond/Leslie sound could not be emulated by a modern keyboard.



"The Leslie looks like a chest of drawers."

This still holds true, though modern samplers can come very close when each note is played individually. Try a run of notes, though, and you can tell the difference. Most synths have a few organ settings which never quite get there; the slow Leslie effect can be almost passable, but the fast Leslie is next to impossible to reproduce, in my opinion. A closer contender is Korg, with their CX3 (or the double-manual BX3), made specifically as a small Hammond substitute in the late '70s. However, even this doesn't come close to the real thing — I know, as I have one as a backup should my 30-year-old baby fail on me. In truth, though, the C3 is very rugged and



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only ever let me down once, when a valve fell out of the Leslie after it was placed on its side. I now always carry a spare set of valves with me.

I recently found out that pre-1968 Hammonds have white capacitors in their generator and vibrato line box, while later ones have red capacitors. The newer red ones allow for a much brighter sound than the white ones, and also last a lot longer. The difference in sound quality can be very noticeable to a player who is familiar with Hammonds. When Georgie Fame was playing in Scotland recently, a friend of mine who runs a Hammond hire company supplied him with a B3. Fame wasn't sure about the sound and thought it could be a lot brighter. The next day, my friend asked Fame what he had at home. When Fame answered that he had a 1974 C3 the problem was solved instantly. Fame's C3 would have had red capacitors, while my friend's B3 had white ones. Not many people would notice this difference, but the ever-professional Fame, having played Hammonds for nigh on 30 years, certainly did!

WHAT'S THE DAMAGE?

If you want to buy a Hammond now, values range considerably, from £100-200 for a battered old T100, to £6500 for a brilliantly preserved B3. The more common C3 would set you back about £2000. If you plan to gig with an organ you really need it split in two (horizontally!) and this can add £200-300 to the cost, depending on whether it has the pedal board and which model it is (some are easier than others to split).

I paid £1000 for my C3 and an extra £100 to have it split in two to allow for portability. Mind you, this was before Hammonds were back in vogue: these days the prices have jumped dramatically, as everyone wants one. You should look in the classified ad sections of keyboard magazines for people selling them, and also seek out the various dealers, who will always have a handful of Hammonds in stock. If you look around you might come across a church selling

one, or perhaps a working men's club.

Remember when you buy a Hammond that it's nothing without its Leslie cabinet. You may have been lucky enough to get the matching Leslie with the Hammond, but chances are that if your Hammond has speakers, this was all the previous owner used. The Hammond will work fine and still make a nice sound, but it won't be the great sound you're after, and it won't be loud enough for gigging. When you do track down a Leslie, make sure you check the number of pins on the connector. The older ones have six pins, but the newer (generally transistor) ones have nine or 11 pins. I (like most) reckon valve Leslies have a much nicer sound than transistor ones, though it comes down to taste. Transistor Leslies can be a lot louder than their valve counterparts — though, in fairness, most valve Leslies are more than loud enough. The valve amps (contained in the Leslie) are only 40W, but this is 40W by valve, so it's louder! Personally, if I've gone to the bother of getting a valve Hammond, I'd want it amplified by a valve amp. If you are not able to get a Leslie at the same time as you buy a Hammond (and Leslies are certainly harder to get hold of), and you find a Leslie at a later date, you must ensure that you get the right connection kit for your Hammond. If you don't, you risk blowing up the amp and possibly causing yourself injury. This really should be left to an expert to arrange for you, as there are over 20 different models of Leslie cab out there and several connection kits. Incidentally, brand new Leslie cabinets range in price from from £1300 to £2000.

NEW FACES

In the late '80s, Suzuki brought the Hammond name, and a new entity appeared, Hammond-Suzuki, and you can still buy new organs made by the new company. But how do they match up? The Hammond Suzuki XB2, XB3 and XB5 have all the features which have become classic in the older Hammonds — the drawbars, the 2nd/3rd percussion, the key click — but they don't have that all-important grungy mechanical sound. They cost around £1400 for the single-manual, portable XB2, £8000 for the double-manual XB3, and between £4000 and £7000 for the XB5. It's a matter of taste, of course, but I don't think they're a patch on the old ones. Hook one up with a Leslie and you'll get a much better sound than any synth, but they ain't tonewheel.

SOUL MACHINE

Booker T and the MGs made a living out of it, James Brown gave singing a miss to play it on several ultrafunky tunes, Deep Purple wouldn't have been the same without it. Although there are others, the prominent purveyors of the Hammond these days are probably the German jazzer Barbara Dennerlein and Jamie Taylor from cool Mod outfit The Prisoners, now with his own Acid Jazz Quartet. The Hammond organ is the essential instrument for breathing soul into music, and long may it continue.

Special thanks to Mark Trayner for confirmation of facts and the swapping of anoraks.













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poradic sightings of MIDI-to-CV converters have occurred since MIDI keyboards first appeared in the '80s, with at least half a dozen models that I can think of without much effort. Some have been more successful than others: early units were as temperamental and unreliable as the gear they were supposed to be controlling. However, with the advent of cheaper and more accurate D/A converters, it's now possible to build stable, reliable and feature-laden units. At the moment Kenton are probably top dog in this specialised area, but EES — who aren't exactly novices when it comes to designing and building for the electromusic industry either, with a creditable pedigree of building interfaces for C-Lab — are hoping to muscle in with this new MIDI-CV7 interface bursting with features.

SEVEN TIMES SEVEN

Each of the seven MIDI-CV7 channels works independently and has an extensive range of

programmable parameters. The system is menudriven, using a nice clear 2-line x 20-character backlit LCD; in its factory-fresh state, the unit emerges from its box with 30 identical presets in user-programmable memory locations. Four arrow keys allow you to navigate the system pages, and there are two buttons and a data knob for entering and changing parameter values. There are also nine (extremely bright) LEDs to indicate CV/Gate, MIDI In and MIDI Clock activity. It was a nice surprise to find an internal power supply, particularly considering the size of the case — although this is a rackmounting unit, it has to be one of the smallest I've come across, only 1U high and 12cm deep (not including the somewhat superfluous front-mounted grab handles). The crowded rear panel has 14 quarter-inch jack sockets for the seven CV and Gate output channels, plus the usual MIDI In/Out/Thru sockets, a DIN Sync output socket and an IEC mains connector.

NAME THAT TUNE

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YAMAHA

EES MIDI-CV7

REAL-TIME MIDI CONTROL

The MIDI-CV7 has a number of parameters editable via MIDI, and the ability to transmit a CV signal derived from MIDI controller information.

RECOGNISED MIDI CONTROLLER	FUNCTION WITHIN MIDI-CV7
Controller 1	
Controller 5	Portamento Time
Controller 7	
Controller 11	
Controller 19	
Controller 20	
Controller 21	
Controller 22	
Controller 23	
Controller 24	
Controller 25	
Controller 26	
Controller 27	
Controller 28	
Controller 65	
Controller 120	
Controller 121	
Controller 123	
Velocity	
Aftertouch	
Pitch-bend	As selectable CV

► LFO information, and each Gate output set to transmit a positive 5V trigger. The CV outputs are set to Octave/Volt scaling, which is fine for most users, but this can be changed channel by channel, if needed, to Hertz/Volts for Korg and Yamaha systems. Using one of these presets, it is possible to use the MIDI-CV7 straight out of the box, assuming your gear is compatible.

However, to get the best out of the MIDI-CV7. the first thing you need to do is calibrate the interface to your analogue synths using a very straightforward process in the CV/Adjust pages. Using a MIDI sound source and MIDI keyboard, you first play the bottom note on your keyboard and use the MIDI-CV7 data knob to adjust the lower tuning of your analogue synth or VCO; then you play a MIDI note at least two octaves higher and tune the upper range; the display will read 'OK', and that's it — piece of cake! The CV tuning range is very wide, an octave and a half at either end of the scale, allowing plenty of scope for taming troublesome VCOs. Things can get a little laborious if you need to tune all seven channels for seven different synths, but at least you do have this option available, and it's particularly useful if you have a large collection of analogue synths or VCOs. There's also the bonus that any special patch or setup can be named and saved as a User Preset in one of the 30 memory locations.

CHANNEL BY CHANNEL

There are a number of output options available for each CV and Gate channel (see the 'CV Output Options' box). For regular use, most channels will be set to Note+Pitch+Mod, which gives you a control voltage mix of keyboard note, pitch-bend and LFO modulation. The pitch-bend range and LFO depth can be programmed from zero to an

octave up or down in semitone steps, and the LFO modulation can be introduced by MIDI mod wheel or channel pressure. The Gate/Trigger signal can also be programmed to transmit 5V, 9V and 13V low-to-high (standard) or high-to-low (S-Type) triggers, which, along with the Hertz/Volt option, means you can drive almost any type of synth. The number of programmable parameters available for each CV/Gate channel adds immensely to the versatility of the unit. Any CV/Gate channel can be assigned to any MIDI channel, and there's also the option of assigning multiple CV/Gates to a single MIDI channel. The benefits of this method become apparent if, for instance, you want to send separate LFO or velocity control voltages through additional CV channels to a VCF or VCA, or to modulate a VCO pulsewidth. The only drawback here is that

"With the MIDI-CV7 hooked up to my analogue system, I haven't had so much fun for ages."

if a CV channel is programmed to transmit anything other than keyboard note information, the associated Gate output is disabled. This is a shame because, as anyone seriously into analogue synths or modular systems will tell you, separately programmable gate signals can be put to all sorts of good uses, triggering analogue sequencers, arpeggios, ADSRs, sample and hold generators and even noise gates and effects units. This omission could be addressed with a future software update, though.

ROLY POLY

There are fundamentally two ways the MIDI-CV7 handles note information: Mono and Poly. In Mono, each CV/Gate channel looks for any note activity on its assigned MIDI channel. There are Mono Priority playing options for highest note, highest note follow, lowest note, lowest note follow, newest note and newest note follow. Most of these are self-explanatory, but the follow feature is used when chords are played in Mono mode. As you release held notes, the next valid note of the chord, whether highest, lowest or newest, will be transmitted. This happens independently of all other channels, unless more than one CV/Gate has been assigned to a specific MIDI channel, in which case you can use Poly. With Poly Priority On, any playing note will be active until it's released, even if a new note is played. Or there's Poly Priority New, which replaces the oldest note in priority with any new notes

pros & cons EES MIDI-CV7 £449

n moo

- Wide-ranging and stable CV signal.
- Logical, easy-to-use interface with a clear display
- Effortless calibration procedure.
- Enough output options to satisfy most analogue synth users.
- System software upgradable.
- Units can be cascaded for greater
 polyphony
- Internal power supply.
- Reasonably priced.

cons

- Poor access to User Presets.
- Gate channels always tied to CV channels.
- No Wasp or DCB option.
- No separate clock/pulse output.
- No mini-jack connectors.

summary

A fully featured, easy-to-use product with stable, wide-ranging outputs. It may lack a few of the more esoteric options and elegant looks of competing models, but makes up for this by having seven of almost everything and a reasonable price. If you're searching for a pro-spec, multiple-output MIDVCV interface, look no further.







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TOTALLY IN TUNE

Once calibrated, the MIDI-CV7 produces an extremely stable and wide-ranging CV signal - in fact, I couldn't believe my ears when I first calibrated it to some old Roland 100M VCOs, because they stayed in tune over a staggering six octaves. For the past eight or nine years I've relied on an ageing Groove M2CV interface and it's never been able to manage more than about three octaves before drifting hopelessly out of tune, even after the obligatory 15-minute warm-up (which, of course, the MIDI-CV7 doesn't require). Funnily enough, a Roland interface and a home-made version I used before the Groove also suffered the same problems, and I've always assumed that the fault lay with the design of the 100M VCOs. Boy, was I wrong! Using the MIDI-CV7 has breathed new life into my beloved system 100M which, since my only CV master keyboard packed up, had been gradually turning into a glorified filter bank.

CV CONTROL

Each CV output can transmit a control voltage from the list below. The CV information is derived from MIDI controller information.

- Key Note, Oct/Volts
- Key Note, Oct/Volts + Pitch-bend
- Key Note, Oct/Volts + Pitch-bend + LFO Modulation
- · Key Note, Hz/Volts
- Key Note, Hz/Volts + Pitch-bend
- Key Note, Hz/Volts + Pitch-bend
- + LFO Modulation
- LFO Modulation only
- LFO Modulation + Pitch-bend
- Pitch-bend only
- Velocity Aftertouch
- MIDI Controller 1
- MIDI Controller 7
- MIDI Controller 11
 MIDI Controller 25
- MIDI Controller 26
- MIDI Controller 27

▶ played. Of course, the number of notes playable depends on the number of CV/Gate channels assigned to the current MIDI channel, but remember that you can have up to 7-note polyphony if you have enough VCOs, and additional MIDI-CV7s can be cascaded for greater polyphony.

LOTSA FUN OSCILLATORS

Having extra LFOs at your disposal opens up all sorts of creative avenues with analogue synths half the fun of using such gear is thinking up more and more devious and mind-boggling patches. If you have multiple CV inputs on your VCOs, VCFs, VCAs, VCA EGs and even VC effects, the modulation possibilities are almost infinite. To find seven programmable LFOs in anything, let alone a MIDI/CV interface, is rare, but that's what's on offer here — one for each channel and, while they may not be as well specified as types found in most synths, they're pretty good. Each LFO can produce three basic waveforms (sine, triangle and pulse) and each waveform has a variable duty cycle and negative, positive and symmetrical waves available. In addition, the speed and waveform cycle of each LFO can be set internally, or sync'ed to an incoming MIDI clock, and the duty cycle can be modulated by a selectable MIDI controller. The depth of LFO modulation appearing at the CV outputs can be programmed to a preset level, or introduced using a MIDI controller such as a mod wheel or aftertouch. I'd like to have seen a ramp waveform and possibly a sample and hold or random setting, but these features will probably be available on the analogue gear you are using. It's quite possible (and pretty easy) to put this interface to use as a multiple LFO generator with a different LFO and waveform on each and every channel: I love it!

A GLISS OF PORT PLEASE

As I mentioned earlier, there are almost seven of everything, and this includes the portamento and glissando options. The portamento is pretty standard, with adjustable settings for time and slope, plus various playing modes: Legato, Continue and Update. But what I found more interesting was the glissando option. If you haven't come across this feature before, it could be described as a basic type of arpeggiator. As in portamento, notes flow across the keys depending on which are held down, but with glissando this occurs in semitone steps. When Time mode is on, the time taken from one note to the next is

variable (in millisecond steps) from a plod, plod, plod through to a fast trill. It would be nice if the glissando speed could be sync'ed to MIDI, but still, this is a welcome and unexpected feature. I had great fun setting different channels to different glissando speeds for some really complex, syncopated sequences — and all in real time too. Great stuff!

IN SYNC

Default mode for the 5-pin DIN Sync output is a standard +5V, Sync24 signal, suitable for driving pre-MIDI Roland drum machines, Basslines and suchlike. There are options to change the sync trigger from a 'leading' to a 'trailing' edge and to enable a Clock Continue signal, as well as a MIDI Clock Divider parameter which controls the output resolution of the DIN Sync clock with an adjustable range of 1-128, where 1 is the default value, 2 halves the speed, and so on. At its fastest setting of 1, the display also reads '96 Notes', which I assumed meant 96ppqn, but it probably refers to the MIDI resolution, as I couldn't get the Sync clock to produce an output faster than 24ppqn. This is a shame, as Korg drum machines require a 48ppgn clock and I'm pretty sure that some American drum machines used 96ppqn. Two LEDs on the front panel indicate DIN Sync Start/Stop and Clock activity, and could be useful tools for troubleshooting lost clock signals and dodgy leads.

A LOAD OF OLD SAVES

My only real disappointment with the MIDI-CV7 is the way in which it handles User Presets (a slight misnomer, as by nature they are not really presets at all). On the review model, only one preset was immediately available for use; to access any others, I had to first load them from memory, one at a time, into what is in effect an editing buffer. This is a pretty ham-fisted procedure and also very annoying. Obviously, a better way would be to have all 30 User Presets accessible at all times, as you'd normally find on a synth or sampler; this would enable you to step through your User Presets quickly and easily, trying out different CV/Gate configurations and setups. I did mention this quirk (plus a few others) to the designers, who couldn't really see a problem with it; they did say, though, that the next software update may include the ability to access User Presets via MIDI program changes, and to save and load Presets as MIDI SysEx dumps. In fact, the designers are quite open to any user suggestions and can be contacted through their web site, which is nice.

SILENCE IN COURT

So what's the verdict, then? Well it has to be... guilty, of being a fine upstanding MIDI/CV interface. With the MIDI-CV7 hooked up to my analogue system, I haven't had so much fun for ages. The rock-steady clock output and wide-ranging, stable CV tuning made my VCOs sound brand new, and as for all those LFOs and glissandos... pure heaven! The MIDI CV7's operating system is logical and easy to use, with 24 clearly labelled parameter pages to scroll through and enough editable parameters on offer to satisfy even the most industrious programmer, which can't be said of some 'budget' interfaces. Apart from the few points mentioned elsewhere, the unit was a pleasure to use. Controlling all seven channels and the DIN Sync from a bloated MIDI sequencer file, the interface worked flawlessly, without any slowing down or hiccuping. There's nothing quite like the sound of a bunch of

"There are enough editable parameters on offer to satisfy even the most industrious programmer."

analogue gear stomping along in full flow, and with this interface you can certainly drive a lot of synths, modules and drum machines simultaneously. In a way, I suppose, this could be a deciding factor: do you have enough analogue gear to justify using the CV7 to its full potential? You could argue that CV synths are a dying breed of instrument (even if they're fashionable at the moment) and most professionals who own any CV gear are quite likely to own a decent MIDI/CV converter already, so is there room for another MIDI/CV unit in this specialised area? However, if you need to upgrade an old interface as I do, or you're serious about all this analogue malarkey and need a unit with a lot of channels, then the MIDI-CV7 would make an excellent choice. It may not look as polished as the Kenton models — if anything, it looks a bit 'Maplin' - but the build quality is actually very good: it has a solid feel. There are enough CV/Gate options to satisfy most analogue users, plenty of real-time MIDI-controllable parameters (see the 'Real-Time MIDI Control' box) and, of course, the obligatory DIN Sync socket. I would like to have seen the option of a Wasp or DCB output, or both, and possibly a few channels with dual CV outputs, but that would have pushed the price up beyond the quite reasonable figure of £449. The EES MIDI-CV7 is another of those essential studio tools that pop up occasionally, with just enough extra features or a low enough price to make them stand out from the crowd. 505





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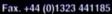
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Worth the weight?



ATC SCM20A PRO ACTIVE MONITORS

PAUL WHITE tests what must be the ultimate small monitor, but finds that you pay for it in pounds — both fiscal and gravitational. TC have a unique approach to building loudspeaker systems, which stems from the obsession of designer Bill Woodman. While other manufacturers are struggling to find cheaper and lighter components, the British-made ATC monitors are still characterised by heavily engineered, well-damped drivers designed to produce a wide dynamic range with minimal power compression and distortion. This tends to make their designs a little less efficient than some of their competitors', but today's amplifiers are not short on power, so this is not a significant limitation.

A recent ATC innovation is the use of rings made from pressure-formed powdered iron to form part of the driver pole-piece. Using these rings to form the inner and outer surfaces of the magnetic gap greatly reduces eddy currents in the pole pieces, producing a dramatic drop in the level of third-harmonic distortion — a problem that's plagued speaker designers ever since someone first had the bright idea of gluing a coil of wire onto the back of a cardboard cone. This new pole-design technology, known as SL, has been

incorporated into all ATC's bass drivers from the SCM20 upwards.

The original SCM20, a firm favourite with classical mix engineers because of its accuracy, is a passive 2-way design in an infinite baffle enclosure, and the bass/mid driver features a large, soft-dome centre section that is largely responsible for the

system's smooth and accurate mid-range performance. Its current version, the SCM20 SL Pro, is basically the same, but now has the SL driver fitted. In designing an active version of this classic design, ATC didn't simply bolt a power amp/crossover pack to the back of the box, but instead brought in an industrial designer. This resulted in a

radical new look, but there's a lot more to the new presentation than cosmetics.

Still a 2-way unported design, the SMC20A Pro is built into a cast aluminium enclosure with a solid MDF baffle almost two inches thick. This is radiused at the edges to reduce diffraction, and the drivers are front mounted into machined recesses. Damping panels are fixed to the inside of the aluminium case, and the heatsink fins for the power amplifier are an integral part of the aluminium casting. Apparently, the tooling for the aluminium cabinet was very costly, but the plus side is that

"The imaging and sense of detail are extraordinary."

manufacture is cheaper, and the finished assembly is acoustically deader than the wooden equivalent.

The bass/mid driver is around 6.5 inches in diameter, with a 3-inch centre dome, and is driven by an edgewise-wound copper voice coil in a magnetic gap that has relatively little clearance, to facilitate higher power handling with good reliability. The magnetic assembly is simply massive, almost the same diameter as the front of the driver, and of course the pole pieces include the SL rings for lower distortion. Both the dome and cone are heavily damped using a viscous material, and the result is a wide, even dispersion with very little in the way of unwanted resonances. The dome part of the driver is similar in appearance to the separate 3-inch dome used in ATC's larger 3-way designs;



ATC SCM20A Pro Active Monitors

"These are the most astonishingly natural small monitors I've ever heard at any price."



▶ to some extent, the outer cone is mechanically decoupled at higher frequencies, producing a progressive crossover characteristic between the bass and mid range. The active crossover between the mid/bass and the tweeter is at 2.8kHz.

A Vifa tweeter delivers the high end: again, this is a soft-domed design that exhibits low distortion and well-controlled dispersion. In the horizontal plane, the speakers have a coherent dispersion angle of $\pm 80^\circ$; in the vertical, better than $\pm 10^\circ$. The quoted frequency response between the -6dB cutoff points is 60Hz-20kHz when the speakers are used free-standing, but, as with all ATC's designs, the critically damped low-end response means that there's a lot of usable energy below the cutoff frequency.

The SMC20A's bass/mid driver is driven by a class A/B MOSFET power amplifier of around 250W, derived from those used in ATC's larger studio monitors; the tweeter is driven by a MOSFET amplifier of around 50W, making possible SPLs of up to 108dB at one metre. The HF amplifier design is designed to work in class A, as it's at high frequencies that crossover distortion artifacts are most evident. A fourth-order filter provides greater driver protection than the second-order filter used in earlier active designs, and these are individually set up for optimum phase correction and time alignment. You might expect to find a torroidal transformer driving the power section, but the SMC20A's design uses the same conventionally laminated transformer as the bigger systems. This is a really heavy transformer and is very conservatively rated, to minimise power supply sag at high listening levels.

At the rear of the cabinet are the XLR input socket, the EC mains inlet and the power switch. along with a voltage selector for 240 or 120V operation. Additionally, there's a bass lift control that provides up to 6dB of low-end boost (40Hz) in five steps, starting with a a flat reference position. Apparently, this was fitted at the request of end users who were used to working with bass-heavy systems, but I get the feeling that the purist in Bill Woodman would rather have left it out! Heavy heatsink fins account for a significant part of the cabinet rear, and four threaded holes are provided for mounting hardware. A recessed handle is moulded into the top of the cabinet, but this is more of a challenge than a practical proposition. The SCM20A may only measure 448 x 270 x 310mm, but it weighs 30kg — or 66lb in real money!

LISTENING TEST

As well as checking out these speakers on my own system and with my own reference CDs, I took the opportunity to try them out in ATC's own listening room, using a CD player that undoubtedly had a more respectable provenance than my own. These speakers are designed to be used free-standing, so they must be mounted on stands, not fitted into wall soffits, and ideally not perched on the meter bridge of your console. Come to think of it, I don't know many console meter bridges that would take the weight...

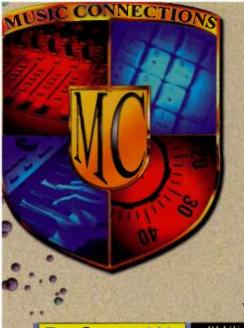
Summing up the sound of a speaker is difficult,

especially when the speaker in question is designed not to have a sound, and it's probably safe to say that the performance of the SMC20As is both natural and effortless. Bill Woodman kindly gave me a copy of Dave Brubeck's Young Lions And Old Tigers, a beautifully recorded album that includes, among other things, some very exposed passages of piano, vocals and acoustic bass. I've since tried this album on other monitors, some of which were quite expensive, but none of them has sounded as smooth and well focused as the SMC20As. Conversely, I put various pop mixes on trial, and the SMC20As left me in no doubt at all as to which were the good mixes and which ones left something to be desired. The imaging and sense of detail are extraordinary, but the detail isn't produced by accentuating transients or adding high-end distortion — it's absolutely clean. Of course, this can create a problem for ATC, because many engineers unconsciously associate distortion with loudness, so if the SMC20As are not distorting, they're not perceived as being as loud as something that is distorting. However, with a ceiling of 108dB, these monitors can go 18dB beyond a comfortable sustained monitoring level, and even when your ears are starting to give up, the SMC20As still retain their integrity.

SUMMARY

In comparison with similarly sized active monitors, the SMC20As are undeniably expensive, at around £3000 a pair. It seems that ATC set a target price when they designed these speakers, but though they came close, they didn't quite meet it. Consequently, they decided to up the price slightly rather than compromise the design in any way, but I've no doubt this was the right decision. If it's a portable reference you want, you'd need to be fit to lug the SMC20As any distance, but for all that, these are the most astonishingly natural small monitors I've ever heard at any price, and their frequency range is wide enough for just about any sort of full-range mixing other than dance or film surround, in which case you might be better off with one of the larger ATC studio monitoring systems at the front. However, they make superb surround side and rear speakers and are perfect for mixing music in small and medium-sized control rooms. The almost total lack of sonic artifacts lets you hear right into a mix, and any flaws in the original material are readily exposed, whereas well-recorded material sounds stunningly realistic, and the imaging takes on an almost holographic width and depth. Not everybody will be able to afford these monitors, but if you get a chance to hear them, I think you'll appreciate where the money went.





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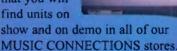
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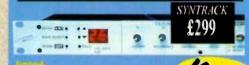
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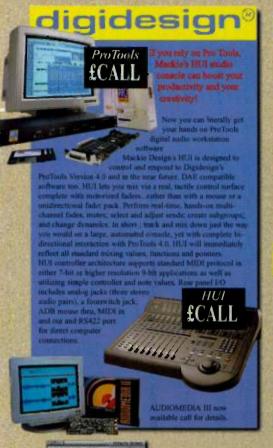






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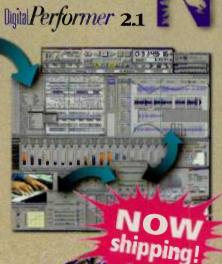


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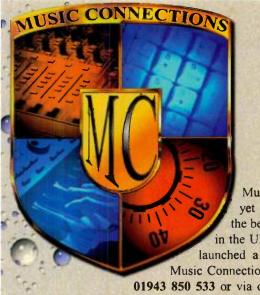
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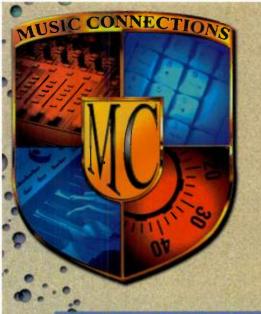
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the Bass race

PEAVEY SPECTRUM BASS II

If you're tempted to try out the whole Spectrum of bass sounds,
Peavey have updated an old favourite, and NICK ROWLAND
has the lowdown...

aving scored a considerable success with the first-generation Spectrum Bass a couple of years back, Peavey have now realeased its sequel, not unreasonably titled the Spectrum Bass II. To merit the addition of the extra digits, they've updated the range of sounds and increased its capacity from 200 to 256 presets, as well as improving polyphony and multitimbrality — up 50% to 12 notes and six parts respectively. With an eye on the revival of interest in all things squelchy, they've added to the synthesizer engine such things as multiple filter types, hard sync, oscillator offset and portamento, to allow the Bass II to emulate more realistically the sounds of Ye Olde Analogue Synths.

In essence, though, the concept is the same. A 1U-high, 19-inch rackmounting box stuffed full of instantly accessible bottom end. Acoustic, electric, fretless, analogue and digital synths, harmonics, slaps, pops — they're all in here, along with a few that defy categorisation. Like the original, the Bass II is primarily designed for Kwik Fix Dial-A-Preset use, with all editing carried out remotely, through either a software editor or Peavey's own dedicated hardware programmer, the PC1600.

The all-new improved synth architecture actually makes the Bass II something of a programmer's wet dream — though you'd be hard put to guess this from the minimalist front panel, where the most prominent feature is the labelling. There's a volume knob, a three-segment LED, buttons for increment selection, transpose,

fine-tuning, mode select, and that's your lot. Round the back, things are equally underwhelming — the Three Wise MIDI Ports, right/mono and left stereo jack sockets, and a socket for the 16V AC adapter supplied.

GETTING TURNED ON

The first 64 presets are actually a selection taken from the other 192, the reason being that these reside in RAM and are thus designed to be overwritten with your own patches and variations. The 192 ROM patches are grouped in a reasonably coherent fashion according to the type of instrument, style of play or type of music (see the 'Preset Highlights' box). Running through the presets, what first strikes you is the sheer range of timbres the Bass II is capable of outputting — from polite, well-mannered jazz basses to screaming analogue monsters that make the inhabitants of the Lost World sound like pussycats. Being something of a techno

"I was struck by the number of presets that are enjoyable to play in their own right."

fiend, I found I spent most of my quality review time among the synth sounds — with 107 presets, by far the biggest section. These include a whole host of inspirational shakers and movers, including woody FM stuff, startlingly bone-shaking sub-basses, and some suitably caustic acid-style examples. Tucked at the back of this section you'll also find Movie Bass 1 and 2 and Slow Movie, which give you that threatening subsonic drone that usually kicks off cinema trailers for action movies.

pros & cons

PEAVEY SPECTRUM BASS II £350

pros

- Excellent presets
- Prodigious programming capabilities.
- Multitimbrality.
- Intelligent legato mode.

come

- More buttons please!
- Perhaps too complex (if that's possible).
- The PC1600 is more a necessity than a luxury.

stummary

A versatile unit, with a wide range of characterful and gutsy sounds, which puts Peavey ahead in the bass race.

SOUND ON SOUND

POWERS THAT BE

The Wall Wart Watchers among you may like to note that the Spectrum II's power supply is one of those where the transformer is connected to the plug by a length of cable, rather than plugging directly into the socket. And it's also got mounting holes so that it can be fixed securely to an immovable object, out of the way of high-kicking roadies or stumbling tape ops. So, without wishing to give the impression that SOS reviews pivot solely around the functionality of a unit's power supply, let me just take this opportunity to say: "Nice touch, Mr Peavey, though [sotto voce] it's a shame about the lack of a dedicated power switch."

Many of the synth basses really came to life with some on-the-fly tweaking of the resonance and cutoff, which was easy enough for me as the review model was accompanied by a PC1600. Most voices are also dynamically expressive they change timbre the harder you hit the key which makes up for the lack of front-panel editing facilities. The same goes for the 'natural' presets, those based on acoustic or electric bass guitars. These are no less impressive in quality terms, though some might quibble at the quantities involved. Compared with the Alesis NanoBass (reviewed last month), for example, the Spectrum Bass II seems to short-change somewhat in the acoustic and fretless department. However, don't various MIDI reception modes — Omni, Poly, Multi and Legato. The first two (both standard MIDI modes) should be self-explanatory. Multi activates multitimbral mode, where the Spctrum Bass II can be set to receive information on between two and six MIDI channels (the number is set by the user), which is a useful way of making sure that the Peavey doesn't take up more MIDI channels than are actually required. Where this unit pulls a few rabbits from the hat is in legato playing. Selecting Legato mode spreads the same preset across up to six MIDI channels, so that the Bass II can be played by a MIDI guitar (Peavey's very own CyberBass, for example), with each string sending MIDI data on a separate channel. In Multi/Legato mode you can still play legato, but assign each channel a separate sound. Bring in the legato footswitch controller (MIDI controller number 68, to be exact) and you're able to toggle between normal and legato playing style in real time on any of the six channels. Et voilà! For the performance-orientated musician, a mixture of channels and voices playing legato and normal with the ability to switch back and forth as required.

PRESET HIGHLIGHTS

- ACOUSTIC: nine patches ranging from heavy to light timbres.
- FRETLESS: 12 smooth and sophisticated sounds in acoustic, electric and chorused flavours.
- P-BASS/SLAP: a total of 15 funky-ass slap and tickle sounds, some with harmonics.
- FINGER: three finger-pickin' good electric basses.
- ROUND: a half dozen twangy pop/funk sounds.
- PICKED: nine picked and plucked examples offering a range of tones.
- HOFBASS/SPECTRE/R-BASS/POP OV1: a total of 16 presets based on samples of classic electric basses of our time.
- POP: four indie pop wonders.
- VEL-SWITCH: five presets that crossfade from one timbre to another according to MIDI velocity.
- WHEEL-SWITCH: Five presets that can move from, say, fretless to acoustic via modulation wheel.
- SYNTH-BASS: 95 examples ranging from cool digital to warm analogue.
- SYNTH: 12 atmospheric and SFX sounds, some of which make passable keyboard pads.

"The Bass II puts some pretty formidable synth power at your MIDI-tips."

forget that, because this unit is up to six-part multitimbral, you can quickly create new hybrids by layering voices. You can also take advantage of some of the voices that sound good in the higher registers to create pad or melodic lead sounds, while still using other voices to pump out the bass. Of course, the only limit in both the above scenarios is the unit's overall 12-note polyphony although if you can afford a second unit, you can make use of the autoflow feature which automatically sends the overspill to a second Spectrum Bass II. It's also worth mentioning that the Bass II can be programmed to ignore MIDI notes above a certain number, so that if you're using a MIDI keyboard without a split facility you can assign bass sounds to the lower keys only.

Talking of how the Spectrum Bass II fits into a MIDI setup brings us neatly to discussion of its

THE BOTTOM LINE

In my review of the Alesis NanoBass last month, I made the point that the bass line is rarely treated as a character part: it's not the sound that matters so much as what notes are being played and how they fit in with the overall composition. And, like the NanoBass, the Spectrum Bass II is excellent if you simply want to dial up an appropriate sound, then get on with the far more important business of writing an earth-shaking bass line. That said, the Peavey is undoubtedly a characterful instrument. Indeed, I was struck by the number of presets that are enjoyable to play in their own right. These are mainly in the synth section, where, as you might have gathered, the Bass II scores very highly indeed with its analogue impressions. What also appeals to me about the Spectrum Bass II (as indeed it did about its ancestor) is its multitimbrality. Not only can you have fun layering sounds, but with up to six parts to play with, the Bass II is potentially a very versatile instrument to have around your studio. And MIDI-fied bassists (if such people exist) will also appreciate the intelligent Legato mode. Though not without faults — you try scrolling through 256 presets with just two squitty little buttons — the Bass II deserves a place on your wish list. Presets and programming power in equal abundance, and at an appealing price: bass never came so attractively packaged before. 505

OPEN THE BOX...

Along with 2Mb worth of 16-bit classic analogue and digital bass waveforms, the Bass II puts some pretty formidable synth power at your MIDI-tips. The 24 oscillators - normally two per voice - can be stacked in fours to create some really fat sounds (though this limits polyphony to six notes), then the two pairs of oscillators can be set to crossfade or cross-switch with a programmable switch point. There are four filter types to play with: 2-pole low-pass, the classic 4-pole low-pass, band-pass and high-pass. There are standard amplitude and filter envelopes and two aux envelopes. Other goodies include portamento, sample & hold, keyboard scaling, pan, LFO, and a very flexible modulation routing matrix (15 sources, with any output able to feed

virtually any input). Whether you're looking to make the odd tweak to an existing preset or to create your own custom sounds from scratch, the Bass II is capable of delivering. To fully utilise this power, you'll need a pretty good grasp of synth architecture, plus some form of external editor, as everything is done via SysEx messages. Naturally, Peavey recommend their very own PC1600 MIDI controller for the purpose and, while any SysEx editor will actually do the job, it's certainly to be recommended for convenience's sake. At the touch of a button, the Bass II will download a complete set of presets to the PC1600, specifically designed to edit the 200 parameters or more involved in constructing a preset sound. As I said, you do need to know a bit about synthesis, though the presets will keep many people going for long enough!



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The Nanosynth is a pygmy on the outside but a veritable Watutsi on the inside. DEREK JOHNSON cuts a swathe through the undergrowth in search of tiny treasure...





pros & cons **ALESIS NANOSYNTH** • 64-voice polyphony · Huge collection of sounds, with plenty of room for user edits. Quality waveforms, good effects. · Sophisticated synth hidden inside. · No headphone socket. Manual reticent on some points. • Effects implementation a little inflexible. · Loads of presets hidden unless you can access them using SysEx. • No editing without SysEx. A fully functioning synth (if you're prepared to use MIDI controllers) in an exceptionally compact and affordable box, the NanoSynth is also an ideal source of the kind of basic sounds almost all hi-tech musicians need. SOUND ON SOUND

t would be no surprise to learn that Alesis were releasing a version of their QS6 synth as a module. The QS7 and QS8 have already been so repackaged, with the QSR (reviewed back in June) offering the sounds and facilities of those instruments in a 1U rack. The surprise is that, rather than flannel the public with another 1U package and charge accordingly, Alesis have actually squeezed the sounds and patches of the QS6 into the third-rack family box used by the hyper-compact Nano series.

The NanoSynth has much in common with its dedicated piano and bass siblings: the size, the external PSU, the five knobs on the front panel. But the similarities pretty well end there, because the NanoSynth is a 64-voice polyphonic,16-part multitimbral General MIDI compatible synth, with 8Mb of waveform ROM and a Mac/PC interface. All this in a box so small, I can't even compare it to a paperback book or video tape!

BOX OF DELIGHTS

To get an idea of what's inside the NanoSynth, check out the QS6 review back in January 1996. The basic waveform set is identical, and the NanoSynth is compatible with any software or sounds that have been designed for the QS6 (QS7 and QS8 sounds are also compatible, as it happens). Obviously, the NanoSynth lacks the display and expansion options of the keyboard. Both instruments have a huge number of patches: the NanoSynth's basic GM Set is joined by three banks of variations, to a total of 512

patches. Add 128 user memory locations, initially full of factory sounds, and you have a comprehensive palette of 640 different sounds to get you started. Actually, there are only 127 user locations, as user patch 128 is reserved as a 'blank' patch, used to silence a particular MIDI channel or channels. This patch can't be overwritten or changed.

If you own a Mac or a PC, you'll be able to check out the QS6 compatibility right away, courtesy of a free CD-ROM. This disk not only provides several banks of QS6 sounds, but also includes a healthy collection of PC and Mac software, including Steinberg's *Cubasis* sequencer, Alesis' own *FreeLoader* System Exclusive dumper for both Mac and PC, and a NanoSynth-specific version of Mark of the Unicorn's *Unisyn* editor/librarian (for Mac users only, I'm afraid). The rest of the disk is filled with a variety of demo MIDI files from various sources.

The NanoSynth's audio connections differ from the rest of the Nano family: a pair of audio inputs joins the stereo output pair, and both sets of connectors are phonos, rather than the jacks found on the NanoPiano and NanoBass. This is the configuration favoured by the desktop music world, and allows you to easily mix the output from a PC soundcard (or any other stereo source) with the NanoSynth's audio.

The manual is fun and approachable, but has holes: for example, the printed MIDI spec is bare bones, you're not told which voices use more than one 'element' (up to four, with more elements meaning less polyphony), the discussion

of the effects is still minimal, and nowhere are you told the composition and number of General MIDI drum kits (there are 15 GM drum sets, by the way). As a new user, I'd want a lot more info on all these aspects, and as an advanced user, the full MIDI spec would be crucial.

MIDI/CONTROL

The NanoPiano and NanoBass were fairly inscrutable little boxes, capable of providing a 256-strong collection of preset sounds, with full editability when sent the relevant MIDI controllers. The same is true of the NanoSynth, except that when it's on its own you'll only ever have access to 256 of its sounds: those contained in the GM bank and the User bank (the remaining three banks of sounds are only accessible over MIDI, using Bank Select commands). The 256 GM and User bank sounds are arranged in 16 categories (Piano, String, Ethnic, and so on) of 16 patches each, and are selected, not surprisingly, using the 16-way Category and Program select knobs. You'll also find that when you change MIDI channel you can select a different sound for each channel. quite unlike the monotimbral NanoBass and NanoPiano. One foible to remember is that for each Program Category, Programs 1-8 select GM sounds, while Programs 9-16 select patches from the User Bank. Note that, when using Bank Select commands to access the full range of NanoSynth patches, some sequencers automatically use Controller 32 (or both Controller 32 and Controller 0) for selecting patch banks. The NanoSynth only responds to Controller 0.

Full editing of the NanoSynth is available over MIDI using continuous controllers, and a comprehensive MIDI spec provides as much editability as a QS6; the user memories, which the NanoBass and NanoPiano lack, mean that edits can be saved. Mac users don't even need extra software, since the *Unisyn* editor/librarian, once it's been set up, works well. Otherwise, you'll need some way of generating the necessary MIDI controllers in order to edit the NanoSynth; presumably, profiles for other generic editors or sequencer MIDI mixers will arrive, although anything written for the QS6 should work.

SOUND

While the GM sounds are as much of a mixed bag as on any instrument, in side-by-side tests with a Roland SC88 Pro Super Sound Canvas the NanoSynth acquitted itself well. On a wide range of dance, pop and Latin MIDI Files, it was hard to pick a winner, with the NanoSynth sounding simply different rather than better or worse. I fed the pair a few classical MIDI files, and here the SC88 perhaps had a slight edge with its solo strings, a touchy area in GM sound sets, with even the Roland unit's examples not perfect. I was using MIDI Files of Vivaldi's Four Seasons, which contains several passages of rapidly repeating notes; the NanoSynth unfortunately showed some evidence of the 'machine gun' effect during these passages, which surprised me — considering the high-quality piano sounds of the NanoPiano, I was expecting great things of the NanoSynth. However, while the piano module obviously comes out ahead for depth and realism (it features dedicated stereo samples, after all), the NanoSynth still worked well, and compared favourably with the SC88 Pro. Again, it's a case of

EFFECTS

The same Alesis Q2-derived multi-effects used in the other Nano modules are once again found here, with four stereo send busses and a range of chorus, flange, delay and reverb effects. Each effect features limited control over one effect parameter per patch, like the other Nano modules, with detailed editing only possible using MIDI controllers, but, as I said, the manual is all but silent on this point. You can use the front-panel knob to set a separate effects level for each channel, though.

Note that there's a slight flexibility problem

with effects: there isn't a centrally addressable collection of effects for use multitimbrally. The effects used by whatever patch is assigned to MIDI channel 1 are active for the other 15 channels, so if there's a particular configuration of effects that you'd like to use for a multi-part sequence, you need to make sure that the patch that needs it, whether a preset or new patch created by you, is on MIDI channel 1. Another point to keep in mind when playing back General MIDI-format MIDI Files is that if they contain GM standard reverb and chorus data, and the sound selected for MIDI channel 1 doesn't, you won't hear a faithful playback.

different rather than higher or lower quality.

Moving outside the GM straitjacket you'll encounter a range of interesting sounds, and the editing potential is good. Think of the NanoSynth as a real synth rather than a playback module, and it will reward you: just be prepared to spend some time poking around with your computer.

A NanoSynth patch has up to four waveforms, each part having key range, pitch and effects settings, and a full set of synth parameters. These include a pitch envelope with its own LFO, filter (with envelope and LFO) and amplitude (again with EG and LFO). The big collection of percussion and synth noise loops can be used as straight-ahead rhythm loops or to add unusual textures to your patches. Not quite wave sequencing, à la Korg Wavestation, but quite a bit more than you'd get from the average GM module.

VERDICT

Many potential NanoSynth owners may find it difficult to accept the idea of paying £375 for something so small. But look behind the diminutive package: there aren't many choices that offer 64-voice polyphony, 8Mb of waveform ROM and well over 640 patches (with 127 User memories) and full GM compatibility in the sub-£500 market. There are a few modules that cost less than the NanoSynth (for example, the Midiman MIDI GMan at £199, the Akai SG01v at £229 and Yamaha's MU50 at £349), but none offer anywhere near the same feature set. If you bought one of each of the Nano modules, mounting them on a rack tray, they'd only take up 1U of space, yet offer an amazing 192-voice polyphony, three pairs of stereo outputs, 18-part multitimbrality and all the advantages of dedicated piano and bass sounds alongside an Alesis Synth with GM capabilities. It'd cost you a little over £900, but what an amazing sonic arsenal!

An Alesis QS-series synth in such an affordable and tiny box is a great idea, and should suit a broad range of applications, especially where space is limited and the maximum sonic power is desired. The cuteness factor is quite high, but it's the sound that'll sell it.

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BRIEF SPECIFICATION

- · 8Mb waveform memory.
- 16-bit linear 48kHz sample ROM.
- 512 preset, 127 user programs, 15
 GM drum kits.
- QS Parallel Matrix Effects (four independent multi-effect processors).
- Mac/PC MIDI interface.
- 16-part multitimbral.
- 64-voice polyphonic.

ERRATUM

Unfortunately, a small error crept into last month's review of the NanoBass module: its price should actually be a rather more attractive £249, rather than the £339 printed.

To recap, it's the NanoPiano that costs £339, and the NanoSynth reviewed here is £375.

mellow SYNTECNO TEEBEE MARK III ANALOGUE MONOSYNTH



The demand for Roland's TB303 remains very strong, given that the 'fad' of the acid line continues unabated. No surprise, then, that Dutch boffins Syntecno have updated their 1996 TB303 clone to make it even more attractive. CHRISTOPHER HOLDER limbers up his tweaking finger.

mini-jacks, DIN sync socket, and MIDI Out/In/Thru. Inside the guts of the machine lurks a ring modulator giving a third (Ring) oscillator option, adding to the square and sawtooth, for more sonic potential. Critically, the rather anonymous black chassis of the original has been replaced with a shocking canary yellow finish.

uthenticity. That really was the original TeeBee selling point when it arrived on the scene in the middle of last year. For starters, the name TeeBee

gave the game away just a bit — hardly room for confusion there. Syntecno weren't just peddling monosynths, or analogue sound sources, or generic 'acid machines'; they endeavoured to be

as faithful to the original and hallowed Roland TB303 as humanly possible. In the words of the (Dutch) manual writers, the sound of the TeeBee is "as original as god can make it", by which I take to mean 'as true to the original as humanly possible'. In truth, there were some attractive additional features: a good MIDI spec, four pairs of CV/gate mini-jack outputs, a MTC-to-DIN sync24 converter, two MIDI Thru sockets, and an external analogue input, all of which made the

TeeBee a versatile performer in any studio.

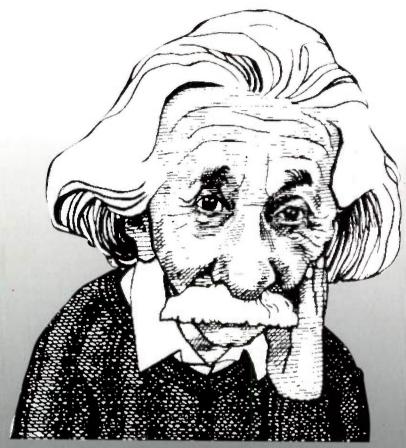
The TeeBee Mark III aims to make its clone format more desirable, again without betraying its principal reason for existence — TB303 emulation. The result isn't a radical watershed, but is still worth the upgrade title. Like the original, the Mark III's back panel is probably more socket than panel, this time with a further two MIDI merge sockets complementing the existing eight CV/gate

YER YELLA

You've got to like the look and feel of the TeeBee, regardless of your feelings about the yellow livery. The 1U front panel is uncluttered, with seven big black knobs dominating proceedings. They're the sort of knobs you can really get a hold of and do some serious tweaking with — the action is very smooth and positive. To accommodate the extra ring-modulated oscillator, a couple of extra pots have been added. Instead of the 2-position Square/Saw switch of old, you now have a 4-position rotary switch to toggle between Saw/Square/Ring and Analog In. It's all self-explanatory, although it should be noted that if you're patching in an external audio signal via the front-panel jack it will be mixed with the other oscillator output, unless the Analog In position is selected. The other additional pot is labelled Ring Detuning, and affects the tuning (and thus the severity) of the Ring oscillator. At its extreme, the ring-modulated signal is sent into a real seizure. Magnifique.

The rest of the front panel is familiar territory. Cutoff, Resonance, Env. Mod, and Decay control the filter, while a Tuning pot fine-tunes the pitch of the oscillator. An on/off rocker switch is also conveniently front-mounted, with a red LED indicating its status — unlike the original model,





'you don't need a degree in

thermonuclear dynamics'

(...if all you want to do is make music!)



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LABYRINTH COMMUNICATION LTD Dominion Court Billington Road Burnley Lancashire BB11 5UB UK Telephone: +44 1282 835800 Facsimile: +44 1282 835900 email:- info@labyrinth-int.co.uk Web:- www.labyrinth-int.co.uk Registered in England No: 3271304 ▶ the new machine's LED doesn't have 'LED' printed above it, which I always thought was a nice touch. Finally, next to the power switch is the Program push button. Ahhh, programming — now that's a story in itself.

BRAIN FLOSSING

Reconfiguring your sequencer's drum map, sorting out the rat's nest of leads behind your mixer, defragmenting your hard drive, flossing your teeth — these are all worthy, highly recommended tasks that a magazine such as *Sound On Sound* would exhort you to do regularly, but they're nevertheless incredibly tedious given that all you really want to do is get stuck into writing tunes. Add 'Programming your TeeBee' to that list.

For a more comprehensive insight into the Syntecno's ternary programming protocol, consult Martin Russ' excellent July '96 review of the original TeeBee. Meanwhile, I'll offer a quick synopsis. To alter internal parameters such as MIDI send/receive channel, and controller numbers assigned to resonance, decay and so on, Syntecno have devised a way of programming using the positions of the knobs and the program button. Enter Program mode by powering up with the Program button pushed in. This will trigger an audio trill prompting you to manipulate five of the front-panel knobs to enter the parameter you wish to edit. Press Program again to confirm, and this sets the TeeBee trilling again (a little lower in pitch this time), cueing you to enter the value of

the alteration in the parameter. My principal gripe with this method is that without the information contained in the manual it's virtually impossible to change something as fundamental as the MIDI channel number. If you scrunch up your eyes tightly and take your brain past the pain barrier you can figure out the positions of the knobs to arrive at the desired value in the ternary counting system, but you do need to consult the manual to find the ID value assigned to a particular parameter. Maybe a table could be printed onto the top of the unit in case of emergency.

If delving into ternary programming doesn't get your juices flowing, you can always talk to the TeeBee using System Exclusive. It's easy enough to dump the unit's entire setup via SysEx into your sequencer. Similarly, your sequencer can talk back to the TeeBee via SysEx messages. Marginally less infuriating.

I think all could be forgiven if DIN switches were fitted on the back for adjusting the TeeBee's MIDI channel number, leaving the more arcane parameters to be adjusted in Program mode. Normally you're far less likely to want to change controller numbers and CV/gate details than you are the MIDI channel number.

ANYONE FOR TEE?

The irritating operating system aside, the actual sound of the TeeBee is what's really important, and I'm pleased to report that Syntecno deliver. I understand that the company have kept the same innards as the earlier model, and the sound approximates the TB303 BassLine's oddball VCF with a 18dB 2-pole low-pass filter of its own. The result is instant gratification. There's no painstaking fiddling about here — just start tweaking and you'll find a killer sound to fit into your mix. Whether it be a hollow square-wave bassline, a brash lead-line, or some real acid you're after, you're on your way with a minimum of fuss. The filter is intended to emulate the TB303, but if you're after something a little more extreme, Synecno have thoughtfully supplied a small hole, labelled 'Aggressiveness', in the front panel. Actually, somewhere inside the hole is a tiny, oneturn screw that controls this parameter. In the end 'Aggressiveness' was quite an appropriate description — it took me half an hour to find a Philips-head screwdriver tiny enough to do the job, then another 10 minutes to locate the head of the screw.

The Ring oscillator gives considerably more strength to your sonic arm. The ring modulator is said to be based on the one found in the Korg MS20. I wish I could confirm this (by which I mean, I wish I had a Korg MS20). What I can confirm is a very useful sound source, with a wide degree of variations possible, from mellow clanging to completely wigged-out Underground Resistance-style madness.

I feel that the most authentic aspect of the TeeBee's TB303 emulation lies in the fact that best results generally result from trial and error, or

BACK PANEL BEATER

If you've got a use for the CV/gate conversion facilities of the TeeBee (or you think your shopping list will include some pre-MIDI 'classics'), that may be all the reason you need to get the cheque book out. What's on offer is four pairs of CV and gate mini-jack outputs. All four may be assigned different MIDI channels, while the gate may be altered to be inverted and the CV signal can be switched between volts/Hertz or volts/Octave.

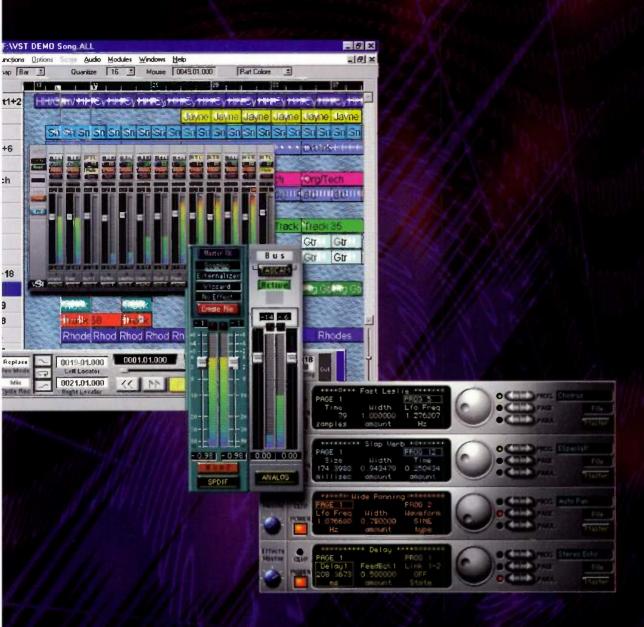
You should find yourself being able to control most of the old pre-MIDI synths, from Moog to Roland, Yamaha to Korg. The MTC-to-Sync24 converter is handy as well. The old Roland drum machines (such as the TR808 and 606, or even the MIDI-equipped TR707 and 909) used Sync24 to synchronise their clocks with the arpeggiator

or sequencer from a Roland synth (such as an MC202 or SH101). Syntecno also decided a couple of MIDI Merge sockets would be useful, as well as the standard in, Out and Thru. This way you can send the MIDI output data of your control keyboard and any other MIDI device going into the back of the unit to be merged with the output of the TeeBee. This is a bright idea, as it saves repatching your MIDI leads just to record your tweaking.

It's about as well-specified a back panel as you're ever likely to encounter, and potentially could make the TeeBee the hub of your MIDI and CV/gate configuration. On the other hand, if your setup is small and without the luxury of racks of vintage esoterica, you may be tempted to wonder in a quiet moment why you paid the considerable surcharge to have all those unused holes in your back panel.



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 completely by accident. Syntecno offer a few hints to set you on your way — keep most of the notes in your acid line very short, incorporate octave jumps, and don't be sparing with the slide and accents — but there's no substitute for luck. Slides and accents are tell-tale features of any TB303 line, and the TeeBee uses controller and velocity information to achieve the same effect. There's little rhyme or reason to a good acid line, but after about half an hour of trial and error I got the TeeBee sighing, squealing and burping away like it was 1989 all over again.

YOU CAN RING MY BELL

The TeeBee has a lot going for it. Primarily it's the multiple CV/Gate outputs and Sync24 converter that you won't find on any other synth on the market. Meanwhile, the Ring oscillator certainly adds a sound that I haven't encountered in any other recent synth. What's more, the inherent tone of the TeeBee is

"The word is getting about that with Syntecno's attention to the TB303's quirks, the TeeBee is possibly the most realistic 303 emulation around."

> actually darn good — there's real character to the filter, and I probably prefer it to the other monosynths of the moment that I've demo'd. You might think that all this in itself would be enough to sell the TeeBee in numbers, but I doubt it. It has a retail price of £529, and at this price you're not looking at much more for a second-hand Prophecy, with all its whizz-bang bells and whistles. Also for around the same money, the TeeBee is up against the appreciably more flexible Waldorf Pulse, and Novation's new Super BassStation offering. No, I wager that if you're going to buy Syntecno's TeeBee it will be on the strength of its TB303 emulation, and if that's the case it's money well spent. The word is gradually getting about that, with Syntecno's attention to the TB303's quirks (zero decay on the accents, and authentic glide treatment), the TeeBee is possibly the most realistic 303 emulation around, and that's still probably enough to make it sell by the crateload. My only advice is to try it yourself, and then (as the annoying git on Blind Date would say) the choice is yours. 505

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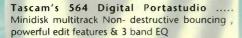
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BIAS *Peak* version 1.6

means that Peak is as fast as Alchemy (and sometimes faster, especially on a Power Mac, since native Power PC code is now included); and there is effectively no limit on the size of open files.

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INTERNAL FUNCTIONS

While some makers of sound-processing software are aiming to more closely define their products' niches (Sound Designer II and Steinberg's ReCycle, for instance), BIAS are continuing to treat Peak as a Swiss Army knife, and expand on its all-things-to-all-people persona. So far, the strategy is working, and nearly all the improvements across the very diverse areas this program covers are successful.

The original Peak broke down its DSP functions into optional Accessory Packs, which could be ordered separately by users. Trouble was, nobody wanted the program unless it had all the Packs installed. BIAS have got rid of that silly convention and all the previously optional functions are now included in the program. (Those who want Peak's editing functons without the DSP features can get a 'lite' version of the program, Peak LE.) The DSP functions used to appear in a sub-menu under Actions; in the new version they have their own menu. Quite a few new functions have been added: Repair Clicks, which does a very nice job of finding spikes in the waveform (you can define how tall a spike has to be to be considered a click) and smoothing them out; Amplitude Fit, which lets you impose a volume envelope onto a file; and stereo-to-mono and mono-to-stereo conversion, each with a left/right balance control.

PLUG-INS

But although the Accessory Packs have gone, the ability of the program to accept third-party plug-ins for added processing capability has increased. Previously only the anaemic plug-ins from Invision Interactive would work: these include chorus, EQ, reverb, and compression, but none of them is particularly easy to use, or even sounds good. Now, however, you can use the formidable Waves collection of processing modules, including compressors, gates, limiters, EQ, stereo synthesizers, and the excellent TrueVerb reverb, from the respected Israeli company

GET ON UP LIKE A *sfx m<u>achine</u>*

SFX Machine is a Premiere-compatible plug-in from BIAS that provides an amazing array of effects for processing audio files. Besides Adobe's Premiere and BIAS's Peak, it's usable with Macromedia's Deck II and Opcode's Vision, as well as any other programs that use the same plug-in format. (No, it won't work with Pro Tools.) The processing is off-line - that is, not in real time. A preview function lets you hear what you're doing before you do it, and most

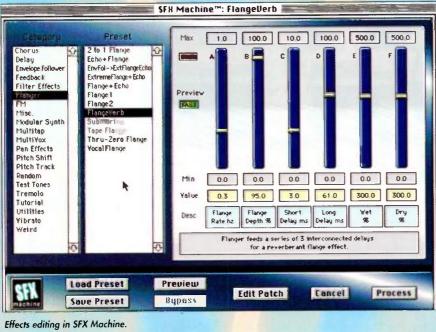
parameters can be changed during preview. Since it works in conjunction with destructive audio editing programs, running a sound through SFX Machine creates a new file separate from the old, and so it needs plenty of disk space to work.

SFX Machine at first glance looks fairly simple, but there's a lot going on under the bonnet. The software provides two views: editor and sliders. The editor somewhat resembles that of the old Oberhelm

Matrix 6: there are eight straightforward-looking building blocks, which can be set up and routed to the other blocks in a large number of combinations. Each block contains a source, which can be an input, a simple waveform, or noise; a processor, which includes fliters, envelope followers, and delays; and two modulators, including AM, FM, ring modulation, and filter modulation, whose output can then be sent to any of the other blocks.

Each parameter in each block is adjustable, and you can set up 'real-time' controls for up to eight parameters at a time. These controls are shown in the other software view, sliders. You can adjust any parameter in the editor while preview is going on, but the sliders makes things much clearer and easier. The length of the preview time is adjustable within some programs (including Peak) and some nice features have been included to cut down on what can sometimes be long waits for the computer to get its act together during the preview process.

It would take many hundreds of words to discuss everything that SFX Machine is capable of: let's just say that you will never run out of ideas for processing sound with this tool. Because it's a build-it-yourselffrom-the-ground-up sort of program, you may take a while to get comfortable with everything in SFX Machine, but fortunately BIAS have provided nearly 200 presets, from the commonplace to the downright bizarre, to get you started in just about any direction you could want to go. There are simple delays, big flangers, additive and FM synthesizers, pitch-trackers and pitch-shifters, auto-wahs, randomisers, and even 50 and 60Hz hum adders. The manual is short and sweet, and while it is far from comprehensive, it is very encouraging, and will inspire experimentation - which is, after all, the point of the product. The only thing I could ask for is, some day, a version that truly acts in real time. In Pro Tools or a similar environment.





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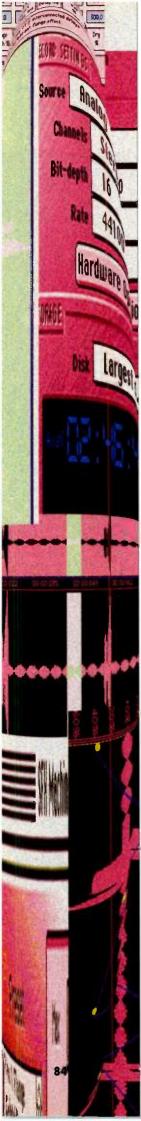
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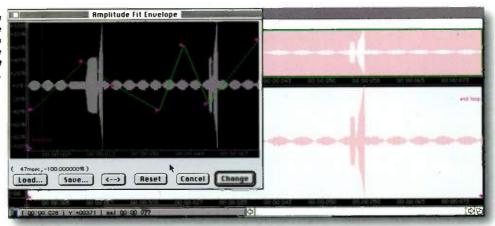
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BIAS Peak version 1.6

Imposing a volume envelope on a waveform with the Amplitude Fit feature.



■ Waves; and BIAS themselves have developed SFX Machine (see the 'Get on up like a SFX Machine' box). You don't need to update all your plug-ins, though: those that worked in all versions going back to 1.10 will continue to work fine.

In previous versions of *Peak*, the Preview function, in which you can listen to how a plug-in is going to affect the sound before you decide to change the file, limited you to hearing only three seconds of the file — not terribly useful on a long and complicated recording. I am told this is actually a result of the *Premiere* plug-in structure, and it is a problem common to all compatible programs, but BIAS have somehow figured out a way around it, and now *Peak* can preview longer segments. There's no direct adjustment of the preview time in the program — as in *Sound Designer II*, the length of the preview

"Peak takes a clever and thoroughly modern approach to how it handles sound files internally."

> depends on how much RAM has been assigned to the program. With a lot of RAM, you can hear quite a bit: in the Finder's Get Info window, I assigned 25Mb to the program and was able to preview 17 seconds of a 20-second file.

FORMATS GALORE

Another area where things have been cleaned up considerably is *Peak's* support of file formats: in addition to *Sound Designer II*, AIFF, and Red Book CD audio formats, the program can now work directly with QuickTime files, so that you can import, process, and export soundtracks from and to a QuickTime movie without any extraction or conversion process. *Peak* also supports the PC's WAV format, as well as AU, SND, and System 7 sounds. Files can be saved in 16-bit or 8-bit formats, and can be subjected to various compression schemes, including IMA 4:1, MACE 3:1, MACE 6:1, and µ-law 2:1.

Of great interest to web designers is that the program now includes a full-featured RealAudio encoder, which converts files into formats that can be streamed from the Internet in real time. The encoder comes complete with 10 different encoding schemes, for use with everything from 14.4K modems to dedicated T1 lines, and on-line explanations of when to use which one.

BATCH PROCESSING

A wonderful new feature in Peak v1.6, especially for anyone who has to deal with large numbers of audio files in developing CD-ROMs, web sites, and other multimedia applications, or working on sample-heavy performance pieces (such as my King Frank, which I wrote about in August '97's SOS), is the extensive batch-processing capability. The way this works is that you create a 'script', specifying what processes you want to apply to a file (you can use as many as you like, in any order you like), what each process' parameters are, whether the processing will affect the first or last n seconds of a file or the entire file, and what to do with the processed files. You then close the script window and go back to the Finder. Now any file (or folder full of files) that you drag onto Peak's icon in the Finder will be automatically processed by the script. You can save the script for use at a later time, and create new scripts that can be loaded and saved at will.

One common problem with batch processing in other programs is that an error in one file will cause the program to come to a screeching halt — I can think of few things more frustrating than setting up 100 files for processing, walking away, coming back 20 minutes later, and discovering that the program stalled on the third one. In *Peak*, this can't happen: if any errors are encountered in a batched process, the Mac will beep, but no dialogue box will appear, and the program will just go on to the next operation or file. You can set up a log text file prior to doing batch processing, and error messages that would normally appear on the screen will be written to that file, so you can look at what went wrong after everything's done.

Conversely, BIAS have thoughtfully provided a way of interrupting when you're batch processing, if you realise after starting the process that you've made a mistake (such as setting all volumes to zero).

SPOT THE DIFFERENCE



Main Features

- Intuitive graphic user interface
- Up to 32 tracks of 16-bit audio
- Virtually unlimited number of MIDI tracks
- 30 staves of music notation
- Unique Groove Quantize
- Integrated QuickTime movie support
- Graphic Tempo Editor



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- O Up to 32 tracks of 16-bit audio
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- 30 staves of music notation
- Unique Groove Quantize
- Integrated QuickTime movie support
- Graphic Tempo Editor
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BIAS Peak version 1.6

Press command-full stop, or click on the Cancel button on screen. The current file will finish processing, but then you will regain control of your computer. And don't forget, everything is Undoable.

DEALING WITH SAMPLERS

For those of us who still like to load our samples into a stand-alone sampler for real-time playback and manipulation, *Peak* remains the only game in town (for the Mac, anyway). To their credit, BIAS, despite this monopoly, are not resting on their laurels, but are continuing to add new features to this part of the program.

New custom profiles have been added for Akai \$1000, 2000 and 3000 and Roland \$760 samplers, so that dealing with any of these models is now a snap. (Ensoniq samplers have always been directly supported.) Plus, communication with all SMDI-based samplers has been vastly improved. For one thing, it's now a real two-way street: the program can scan the sample RAM of a connected sampler and report back not only the name of the sample in each register, but also what type it is and how big. Loading time has been considerably reduced: in previous versions, a 10-second mono sample took 28 seconds to transfer to a Kurzweil K2000 — now it takes 18 seconds.

Some users in the past have encountered a small but annoying glitch when sending looped samples to and from *Peak*: some samplers count the samples slightly differently from the way *Peak* counts them. To get around this, the program now lets you set start and end offsets of loop times, to match those of your sampler.

SMDI errors are dealt with much more gracefully than in previous versions. Formerly, an error on the SCSI line would cause the program to crash, but now a polite (although sometimes erroneous) message merely appears to tell you that the SMDI device can't be found. The old MIDI

"Peak v1.6 has so many improvements it deserves to be called 2.0."

Sample Dump Standard is now supported, so pre-SMDI samplers can benefit from *Peak's* editing features, although the protocol (especially if you're used to SMDI) is excruciatingly slow. Best of all, the batch-processing capabilities extend to sample transfers, so that you can send literally hundreds of samples between *Peak* and your sampler with a single stroke (but then take a long lunch).

OTHER GOODIES

There are a whole lot of other small but very nice additions. You can make custom assignments of command-key controls for just about every program function. If you already have *QuicKeys*, the popular macro editor from CE Software, this may seem redundant, but it's actually quite a bit simpler and faster to use than *QuicKeys*. You can

select a group of markers and nudge them backwards or forwards in time, with microsecond precision. The program's original approach to scrubbing — playing adjustable 'time slices' at the correct pitch — is still in there, but old-fashioned tape-style scrubbing, where the sound speeds up and slows down as you move the cursor faster and slower, has also been implemented. Personally, I liked the original method better, but obviously others disagree. The new scrubbing method is, unfortunately, a little flaky, and stalls often — on the other hand, it's the only feature in the software that didn't work as well as expected.

While audio performance with the Mac's own input and output hardware is certainly adequate for many applications, professionals who need the highest quality (or digital I/O) will want to use Peak with Digidesign hardware, and some old problems in that area have not been solved yet. Unlike programs such as Opcode's Studio Vision, which address Digidesign hardware through the Digidesign Audio Engine (DAE) software, Peak relies on Apple's Sound Manager, and there are conflicts between Peak and the software that Digidesign provide for Sound Manager. If you have a Pro Tools III hardware setup, then unless you use old versions of the DigiSystem INIT (2.95) and Digidesign Sound Drivers (1.31), you'll get serious glitches from the hard disk on playback. However, Pro Tools 4 software won't work with those drivers: it needs DigiSystem INIT 3.1 and Sound Drivers version 1.4.2. You can have both sets of drivers on your hard disk, but you can't use them simultaneously, so to switch back and forth between applications you have to restart your Mac! A royal pain, to be sure, and one that I hope can be eliminated soon.

On a brighter note, the documentation is much improved. Of course, even if all BIAS had done was fold the Accessory Packs documentation into the main manual, it would have been a big help, but they've done even better than that: the organisation of information is excellent, and there are lots of helpful hints and 'How do I do this?' sections. Included are a pretty good troubleshooting section, a fine index, and a list of keyboard shortcuts.

All in all, this is an excellent upgrade to what was already a very useful and well-designed product. BIAS have obviously thought a lot about the many ways that *Peak* can and will be used, and addressed them all in a package that's comprehensive and comprehensible. If you're a Mac owner who is serious about digital audio for any application at all, *Peak* should be on your hard disk.

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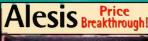
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Cakewalk

Cakewalk's ROBIN KELLY passes on some hints and tips designed to help users of the popular Cakewalk Pro Audio PC audio sequencing package get the best from their software.

akewalk Pro Audio v6.01 is the most powerful version of Cakewalk to be released. It has Active Movie effects, both in real time and off-line, StudioWare and new audio edit commands. With all this technology, it's easy to become slightly overwhelmed, so in this article I'll take you through a basic recording process and show you how to start becoming a Cakewalk power user.

SETTING UP AND RECORDING

Almost certainly the first thing you'll want to do is record some tracks. Whether you're

preparing Cakewalk to record MIDI or audio, you'll need to follow very similar steps. For recording MIDI, go to **Settings I MIDI Devices** and make sure you've selected the In and Out ports you wish to use. For recording audio, go to **Settings I Audio Options** and select the correct Playback and Record Wave

devices from the drop-down list.

Once you have your I/O devices selected, you need to assign a Source for each track you wish to record. To select your recording source, you can double-click in the Track View's Source column and use the Track Properties box, or you can Shift-Click to scroll through your choices (which is a much quicker method).

If you're recording a MIDI track, you will also want to assign a Port, Bank, Channel and Patch. If you do not have the correct Instrument definition selected for the Port the track is using, you can change it by going to **Settings I Instruments**. Once you assign the right instrument definitions, your gear will be seamlessly integrated with *Cakewalk*, and all future recording and editing sessions will work more smoothly.

From the Instruments dialogue box you can click on the Import button and load the

Instrument Definition that matches your make and model of MIDI gear. If you don't see the Instrument Definition you need, *Cakewalk* is constantly updating its web site (www.cakewalk.com) with new ones. You can also create new definitions from scratch, or use existing definitions as templates that you can modify to your satisfaction.

Once you've imported the Instrument Definition, you need to assign it to the correct MIDI Port. (If you're using a single-port MIDI interface, the choice is simple.) You can do this by first selecting the correct Port and Channels from the left column and then selecting the correct definition from the right column. Click OK and you're ready to go. This is a global setting that Cakewalk saves for future use, so you won't have to go back and change it every time you run Cakewalk. If you wish to attach a SoundFont bank to your file, you can do this by selecting File | SoundFonts. Then simply choose the bank you wish to use and select Attach.

The next thing is to choose a Record Mode. *Cakewalk* allows you to record in



CFX and Q-Tools plug-ins running within Cakewalk Pro Audio v6.01.

Sound on Sound (Blend), Overwrite (Replace), or Auto-Punch In and Punch Out modes. You choose by clicking on the Record Mode button located next to the Clock Source button on the Control Bar, or you can go to the **Real-time I Record** menu. Then set your sample rate, which can be up to 48kHz, press record, and you're off.

EDITING

Now that you've recorded the first track of your next hit single, you may need to do some tweaking to get things just right. Cakewalk lets you work with MIDI and audio data as 'clips', which you could think of as building blocks that can be of any length you wish. Some people like to break up clips on measure boundaries. From the Track View you can drag and drop clips based on a

"Automation is as simple as everything else in Cakewalk... you can automate virtually every widget in the view."

Snap resolution, or even copy and paste clips as linked clips. Linked clips allow you to make a change to one clip and have that change applied to all other clips that are 'linked' to it. This is great for pattern-based sequencing. For detailed edits you can use the Event List, which is accurate down to the 'tick' level (pulses per quarter note). For edits where you don't need tick-level accuracy, you can use the more graphically based views, such as the Piano/Controller or the Notation views.

The Piano Roll view now contains both MIDI note information, in a player-piano type grid (displaying notes on a pitch+time grid), and MIDI Controller information, displayed in an adjacent window. To extend a note's duration in this view, simply click on the right end of the note, using the Draw tool, and stretch out or shrink the note to the desired length. If you wish to insert a number of notes with the same attributes you can click on the first note and all subsequent notes you enter will have the same velocity and duration. If you have one note you wish to repeat, you can use the Paste Repeatedly command from the Paste dialogue box.

Transposing a series of notes is easy in the Piano Roll view. Let's say you have a snare drum note you want to change to a rimshot: simply double-click on the snare drum from the list on the left to select the notes; if you're not using an instrument definition mapped to drums, double-click on the note on the piano keyboard. Then, with the selection tool, click and drag any of the notes to the new instrument or pitch. It will take you longer to read these steps than to do it!

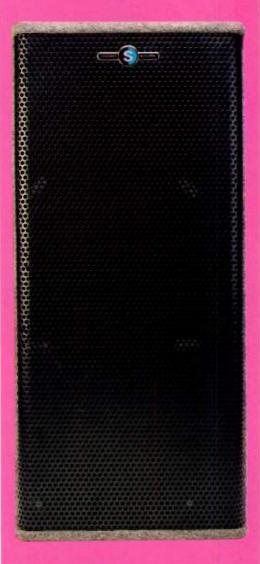
If you're blessed with the ability to read notation, you may be more comfortable working in the Staff view. This view can display notes being recorded in real time, so you can see your notes appear on screen as you play them. You can also use the percussion notation for all of your drum lines. If you click and drag a note, it will move diatonically; however, if you click on the note and then press the right mouse button, you can move it chromatically.

If you find yourself doing the same type of edits repeatedly every time you run Cakewalk, consider creating a CAL macro to handle regular tasks. CAL(which stands for Cakewalk Application Language) is a powerful way to create your own commands within Cakewalk. CAL is not for the faint-hearted (in fact, we recommend you have some programming background if you plan on writing CAL routines from scratch), but if you can press a button on the screen. you can create a CAL macro. Cakewalk will record your keystrokes, and save them as a CAL routine that you can map to a single keystroke. You can also view and further edit the macro in the CAL view

- Select View I CAL and press record.
- Now perform the task you want CAL to record.
- When you're finished, press stop.
- You can save this file so that you can call it up when editing other sequences.
- To run the CAL program, press the Run button or go to Edit I Run Cal Program and select the CAL routine you wish to use.

What if you've recorded audio? Cakewalk Pro Audio v6.01 has many new features you'll find extremely useful. If you open the Audio View you'll notice that there's a new tool option located next to the Snap button. This is the Snap to Zero button. With this button depressed, you can cut recorded audio directly on zero crossing points, which means that you won't get that annoying click after you cut a piece of audio. If you're using the Scrub Tool and you've found the perfect edit point, don't risk losing it by selecting the







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Cakewalk



The Roland VS880 StudioWare Panel, one of the Panels available to help you control your gear from within Cakewalk Pro Audio v6.01.

scissors tool and performing a cut instead, just right-click on the audio event and select Split from the Inspector menu.

USING AUDIO EFFECTS

By right-clicking on selected audio events you can activate an off-line CFX or other third-party DirectX audio plug-in. Remember, you may have to wait for an effect to process, but once it's done the CPU is free to do other things, such as playing more audio tracks! You can call up an Audition from within any DirectX plugin window in Cakewalk. Cakewalk Pro Audio v6.01 does have real-time effects too, which have true stereo support in this version. If you want to run a real-time effect, you'll need to set it up as an effects loop from the View I Effects dialogue box. If you want to change the volume of clips, you can do this by rotating the volume knob in the lower left corner of every clip. If you select the Line Draw tool you can draw in fades over a clip.

MIXING

Once you've edited your opus, it's time to do a mixdown. Select all your tracks and open the Panel view. The StudioWare Panel may look like the Faders view from *Cakewalk* v5.0, but that's where the

similarities end. StudioWare can give you virtual control over any MIDI device and can be bound to Cakewalk Key Bindings and MCI commands. You can use the default Panel or the ones shipped with Cakewalk. New Panels are available at www.cakewalk.com, and you can even create your own. If you're going to create a Panel, it's a good idea to have the manufacturer's MIDI implementation chart handy for the piece of gear you want to support. Most of us have rack gear that sounds great, but the problem is that most rack units have tiny screens and four buttons to get through numerous menus. StudioWare lets you create the interface you want for your gear, so you can get to the functions you need, fast. You can design the Panel so that only those commands that you use the most are displayed. To get an idea of how powerful StudioWare can be, check out the Roland

"StudioWare can give you virtual control over any MIDI device..." VS880 and Yamaha ProMix01 Panels shipped with *Cakewalk*. They also come with the free demo version of *Cakewalk* that is available at our web site.

Once you have the StudioWare Panel loaded, you're ready to automate your mix. Automation is as simple as everything else in Cakewalk and, as you would expect, you can automate virtually every widget in the view. Press the Record button within the Panel view, then press play in Cakewalk. Now start to mix; if you make a mistake you can use Edit I Undo. Cakewalk has 256 levels of Undo so don't worry about making mistakes. To play back the automation in Cakewalk, select the Update button and press play in Cakewalk. If you like a fade but want to edit it graphically, go to the Piano Roll view for the track in question. From there you can draw in Controller 7 (volume) data. Snapshot allows you to take a picture of the Panel at a given point in time. To make a Snapshot, simply press the Snapshot button — it has a camera graphic on it.

You're on the way to becoming a Cakewalk power user. If you'd like to find out more about the topics discussed here, visit our website, where you can check out the newsgroups or grab a tech document to study at your leisure.

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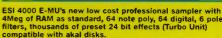
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Steinberg Wavelab 1.6



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pros & cons **WAVELAB 1.6 £329** · Easy to use for basic CD writing. • DMSS plug-in compatibility allows other mastering tools (such as the Waves Native Power Pack) to be used. . Comprehensive help file. • Excellent value! . Can be slightly confusing at first without a printed manual • No link between CD Program list and graphic virtual file. • Add Tracks in CD Program allows non-44.1kHz files to be loaded. summary A bargain upgrade adding significant facilities for basic CD writing, as well as support for third-party plug-ins. SOUND ON SOUND

▶ DMSS should mean that software developers will move some of the existing Mac plug-in designs across to the PC platform, since their potential market for PC plug-ins has effectively quadrupled. To look at it another way, an added benefit for users is that you can use the same DMSS plug-in for both CD mastering and multitrack recording.

WaveLab 1.6 recognises every installed DMSS plug-in — the first time I ran the program it already had the entire contents of my Waves Native Power Pack in its list, along with the CFX effects supplied with Cakewalk Pro Audio 6.0. Unfortunately, the bundled plug-ins that arrive with WaveLab remain resolutely non-DMSS, so although they appear in the WaveLab selection list they will not be available to any other DMSS-compatible program. Steinberg say that these bundled plug-ins are likely to remain as they are; otherwise, all the world and his dog would copy them for use with other programs. The only bonus of this approach is that the dedicated plug-ins take slightly less processor overhead than the DMSS ones. Although the more expensive (and copy protected) plug-ins for WaveLab - such as the DeNoiser, DeClicker, Spectraliser and Red Valve-It currently only work with WaveLab, the next upgrades for these will probably have DMSS

compatibility. Sound Forge, Cakewalk Pro Audio and Cubase VST owners can then also use them, giving Steinberg a bigger potential market.

MARKING TIME

Steinberg have completely overhauled their audio file marker system for CD-R use. There are now three basic types of marker:

- Generic
- Temporary
- CD Track

Generic markers are saved with the file, whereas temporary ones are not. CD Track markers include Track Start, Track End, Track Boundary (a single marker that is both the end of one and the start of another), and Track Sub-index (used to pinpoint sections within a single CD Track, but largely ignored when played back on consumer CD players).

There's a useful 'Quantise to CD frame' option for Track Ends and Boundaries, which moves the marker to coincide exactly with a CD frame (each frame written to the CD is 588 samples long). Leaving the option box unchecked allows WaveLab to add a tiny amount of silence to the pause between tracks, to ensure that the Track End marker is exactly on this boundary. However, if you need to place a marker in the middle of a live set, this option is extremely useful, as it simply moves your marker slightly towards the next boundary. Fortunately, the markers retain their position relative to the audio data, even if other material is added or deleted. Markers now also react to undo/redo commands.

CD-ROM WITH A VIEW

Since the new raison d'etre of WaveLab is CD mastering, there are several new choices in the File menu. You can now create a New CD Program

GETTING CONVERTED

One of the perils of assembling complete CDs of audio data is importing data at differing sample rates. If these get mixed, some tracks may end up being burned at the wrong pitch; it is not unknown for this to happen, even on commercial pressings. Wavelab will flag an error if you attempt to write a CD, save a CD image file or use the Check option if there are any tracks that are not at the correct 44.1kHz sample rate. However, it would be more useful if a dialogue appeared during the process of adding tracks to a

CD Program, If the file was not 44.1kHz, offering the option of converting to this rate and saving under a different name. Currently, anything that you load into a CD Program (whatever its sampling rate) is played back at 44.1kHz (and perhaps, therefore, at the wrong pitch). If you don't have full familiarity with the material you're assembling, this might not be noticed until you try to burn a CD. The moral is clear — check the sample rates of your WAV files carefully, and if any are not at the required 44.1kHz rate, load the individual file into Wavelab, use the Resampler plug-in with Apply, and then re-save the file.

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Steinberg Wavelab 1.6

WATCHING YOUR PS AND Qs

PQ codes contain information about the positions of each track start, as well as any Sub-Indexes and Pauses. They also contain timing information in minutes, seconds and CD frames. Although entering such details is not difficult, there is also a set of rules about having silent frames before each track, and pauses before the start and after the end of the whole CD, which ensure that your CD should play back successfully on all CD players. This sort of arcane information can be difficult for beginners to master with some software, but WaveLab usefully collects all these 'hidden rules' into an Advanced Settings box, whose default settings can normally be left well alone.

▶ (which contains details of your tracks), and the Open option contains two new entries — the aforementioned CD Program, and Import Audio CD Tracks, which allows you to use your CD-ROM drive to grab audio from standard audio CDs. This only supports SCSI CD-ROM drives, but worked well with a Sony drive I was testing at the time. Although I can see the sense of this restriction, as grabbing from IDE CD-ROM drives has often been a bit hit and miss, there are still a lot of people out there with the cheaper IDE CD-ROM drives who would find audio grabbing useful for other purposes.

The CD Program is basically the list of WAV file segments, with user-defined pauses between them, that will end up on your CD. Steinberg recommend burning 'on the fly,' which avoids having to create a further complete image file (in the case of a typical full CD this would be in the order of 600Mb). When a CD Program is active, a new menu, called CD-Wizard, appears; you can also open this menu from the top left corner of the CD program window. Once you've assembled these file segments, using the Add Track command on this menu to point to additional WAV files, you can drag and drop the items on the list in any order, or drag and drop a whole WAV file or a portion of one from another WaveLab window. You can also adjust the length of

use by setting a Preference under the new CD-R tab) allows plug-ins such as the Waves *L1 Ultramaximiser* mastering tool to be used to tweak your album in real time, although you need to use the Apply option to permanently change your data before you attempt a burn. You can join all the tracks in the CD Program into a virtual file, with or without any inter-track pauses you have added, and this virtual representation of your CD can be saved as a single file for archive purposes. Unfortunately, the virtual file and CD Program are not linked, so if you

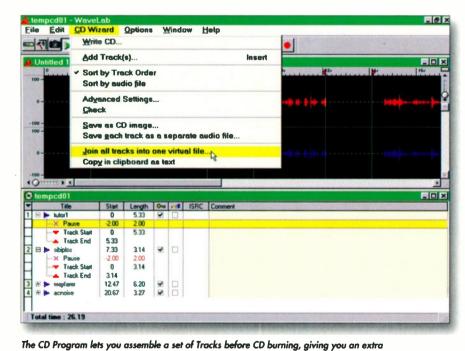
"This is (as far as I know) the first all-in-one package that allows graphical waveform editing and CD burning without making you leap in and out of several programs."

make any further changes to either window they will get 'out of sync' (although you can open a fresh virtual file that will always reflect the current state of the CD Program window at the time of opening).

GOING FOR THE BURN

Once you have completed the CD Program to your satisfaction, you simply click on the Write CD option, which causes a dialogue to pop up. This allows you to either test-write the first track or the whole CD, or to actually perform the write. The CD writing engine is courtesy of CeQuadrat, who wrote the WinOnCD program I mentioned in the TEAC CD-R50S review in the May issue of SOS, and specific driver updates can be obtained from the CeQuadrat web site. You can set writing speed at 1x, 2x, 4x or 6x, depending on your drive and system capabilities.

For people who have a neat collection of WAV files, ready topped and tailed, and all at the correct sample rate, the CD Program is a neat and easy way to produce a master CD. However, anyone who wants to move the entire contents of a DAT tape digitally into the PC, highlight the start of each track, and then burn a CD, will find it a lot easier to remain largely within the normal Wave window. As long as you use Track Starts and Boundaries rather than Generic markers (which are ignored by the CD Program), you can leave your hour-long WAV file in one piece, and mark the start of each new track graphically. Any crossfades between tracks can be carried out using the normal WaveLab editing facilities, and the desired position for the



CD-Wizard menu, where you can produce a virtual file showing all the data in one place.

FURTHER READING

SOS reviewed version 1.01 of WaveLab almost exactly a year ago, back in the August 1996 issue. That review will clue you in on the established features of the program.

any pauses between them, though you cannot adjust CD Track Starts, Ends or Sub-Indexes from the CD Program list: this must be done using markers in the audio files themselves. Any WAV file may be opened, to adjust the markers, by double-clicking on the Start Time field in the current CD Program. ISRC (International Standard Recording Code) data can be included for commercial releases if your CD-R machine supports it, as can UPC/EAN (Universal Product Code) details.

The Master Section from this window (which you

Auvaii	ced Settings	
UPC/EAN		
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PQ Adjust	ments (as CD Frames)	
	Silence before first track 30	
	Silence before any track 5	
	Track Sub-index advance 5	:
	Silence after each track 2	
	Silence after last track 60	•
₩ No ad	justement for tracks without pause	
▼ Take	in account in track fist display and pla	yback
F C	as default settings	

The arcane settings that should ensure that your CD will work properly are grouped into a separate dialogue — these defaults should allow your CDs to play back even on cheap and nasty CD players.

Track boundary between the two can be marked as well.

Once you've done this, you simply select New CD Program, and then use the Add Track command to load in your annotated album-length WAV file, which then appears with all the PQ codes in place. You can still juggle the order of the tracks, and adjust the gaps between them, before burning your CD. If you prefer to adjust pause lengths from within the Wave window instead (so that you can see the actual waveforms move in real time), you can use Insert Silence or Delete on a selected area, and then adjust the 'Default Pause before a Track' preference to zero before creating your CD Program.

CONCLUSIONS

WaveLab 1.6 is a valuable upgrade — and free of charge for 1.5 owners too. Adding the capability for DMSS plug-ins gives it more versatility, and the updated marker system works well. Being able to import audio from CD is also a useful option. Many people have been waiting for a good quality stand-alone CD mastering suite on the PC, since the current packages for CD writing, whilst excellent for general purpose CD-ROM use, often leave something to be desired in the audio department.

I did find it slightly confusing at first that there are always several different ways to do the same thing, especially since there's no new manual for the upgrade, but fortunately the help file is comprehensive and informative, even giving a good section on the background of CD-R.

This is (as far as I know) the first all-in-one package that allows graphical waveform editing and CD burning without making you leap in and out of several programs. No doubt future upgrades will link the CD Program and the graphical virtual file more closely, but even at the moment I think 1.6 does enough for many people's applications. Far from becoming obsolete as sequencers take over the task of real-time music effects, WaveLab 1.6 has stepped neatly sideways into a new and exciting role.

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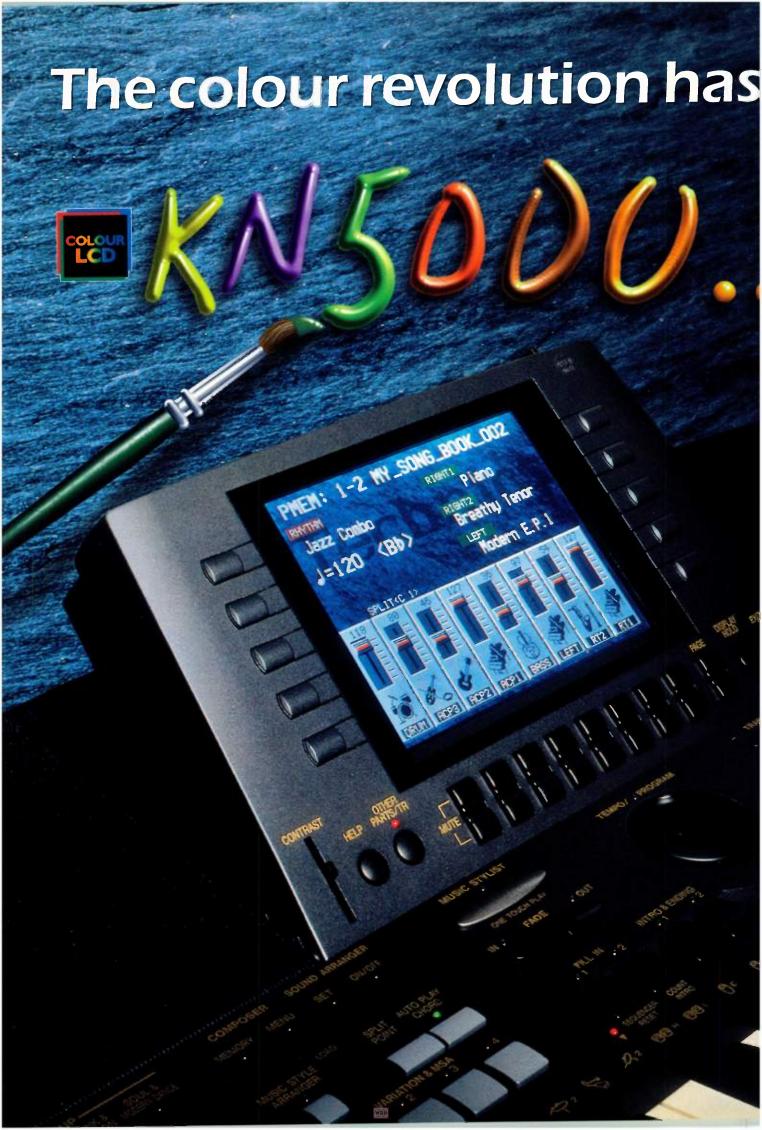
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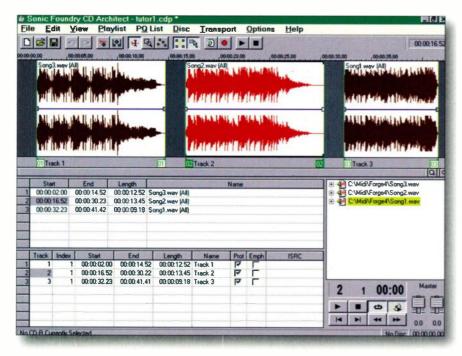


Figure 1: CD Architect's five main screen areas: Track View at the top, showing all audio regions (the vertical grey areas are pauses); below left the Playlist and PQ List, and to the right the Audio Pool and Master/Transport window.

Build and

SONIC FOUNDRY CD ARCHITECT

Writing audio CDs is getting easier and easier, especially with this new release for the PC from Sonic Foundry.

MARTIN WALKER rubs two files together and goes for the burn.

D-R is becoming a far more common way for musicians to pre-master new albums, as

well as to keep backups of work. In the past, it's often been difficult to buy software packages that cater for musicians, since the burning of audio CDs tends to require different features from those for burning CD-ROM and other CD formats: a means of adjusting the gap time between tracks from the default two seconds (for artistic purposes); a way to add extra track indexes part way through a long piece of music (which will enable continuous live recordings to be played on a track-by-track basis); and a means of cross-fading between two tracks (which needs zero length gap time).

CD Architect is a new audio editor and CD-burning software package from the makers of the well-respected Sound Forge audio editor — with the recent arrival of the version 1.6 update of Steinberg's WaveLab (also reviewed in this issue), which also includes CD-R support, things seem to be finally hotting up in the audio CD-R stakes. WaveLab 1.6 proved more than capable of fulfilling basic audio CD requirements, and had the advantage of being a free upgrade for existing version 1.5 owners, but Sonic Foundry have chosen a slightly different route, supplying CD Architect as a separate package, complete with Sound Forge XP (a cut-down version of Sound Forge 4.0b). CD Architect is still a plug-in,

so existing *Sound Forge 4* users can install it as an integral part of their existing audio editor, but new purchasers effectively get a complete stand-alone package, albeit with the rather reduced feature set of the *XP* editing section.

GETTING STARTED

Installation is simplicity itself. From the opening menu screen (which also allows you to install demo versions of all other Sonic Foundry products), you can either install CD Architect as a plug-in if you already have Sound Forge 4.0b, or install the supplied Sound Forge XP to run it. There's even an auto-detect option, which looks for an existing Sound Forge installation. Copy protection is through a unique 'activation code' number supplied on a small label stuck inside the manual, which is one of the more benign systems available. The setup program will ask for this code to be entered again if you ever re-install the program, but the program itself remains mercifully free of dongles or hidden files. Once the installation is complete, CD Architect simply appears as an additional item in the Sound Forge Tools menu. The size of the plug-in install is about 5Mb, but demo WAV files are also provided, which bring the total up to about 11Mb (you can delete these later on if you want to reclaim the space).

MAIN SCREEN FEATURES

Although CD Architect needs either Sound Forge 4 or XP as a launch pad, it seems to use only their underlying audio routines: once its own window

appears, it is self-contained, and you don't have

appears, it is self-contained, and you don't have access to any of the other *Sound Forge* menu items. The screen layout can be customised, but it has five main components: the Audio Pool, the Track View, the Time Ruler, the Playlist and the PQ list.

When you open a new CD Project, you start by adding WAV files to the Audio Pool. Files can be selected en masse by shift-clicking, so you can grab a whole selection of files for a project in one go. There's also a Read Audio option that allows you to digitally grab any part of an existing CD to import to your project (from SCSI CD drives only). The Audio Pool's contents appear in the middle of the right-hand side of the screen display, and any of the sound files here can be clicked and dragged to the Track View window, where they appear as a graphical wave display. Alternatively, you can right-click on the file and choose Add as Track. and in this case regions are dropped after any existing ones in the Track View window, with a default two-second gap, which can be changed via a Preference setting — there are no restrictions on gap lengths. Further items can be dragged from the pool and dropped anywhere in the Track Window in relation to existing regions.

Above the wave display is the Time Ruler, and this

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SONIC FOUNDRY CD Architect

▶ is the absolute time reference for each entire CD Project. Beneath the wave display is the marker strip, which displays the track or index tabs. Again, you can click and drag these, and the track tabs have an additional feature: if you click between track start and end tabs, both are picked up, making it easy to move an entire track without altering its length.

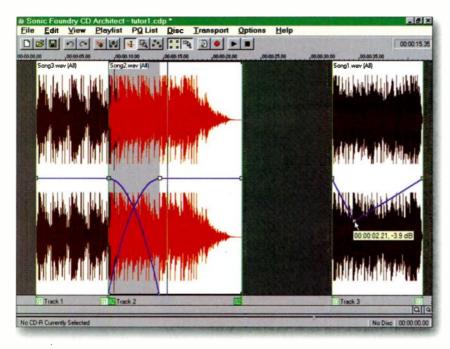


Figure 2: To alter the volume of a track (either a part, or the whole file), just drag the audio envelope, as shown here in the right-hand track. The two tracks on the left-hand side have been crossfaded; the one in the middle was simply picked up and dragged across the end of the previous track.

MANUAL SKILL

I've never understood why so many software manuals give comprehensive descriptions of all the functions without providing a guide on how to use them effectively - so compliments must go to the authors of the CD Architect manual (and help file). Apart from a clear layout, with everything in a sensible order (Introduction & Installation, Quick Start, Using CD Architect, Reference, Appendices), it contains, in the Introductory section, the clearest and most complete overview of CDR. description of different 'book' standards, and PO code details that I have yet come across. But best of all, for those who are newcomers to CD burning, the 'Using' section includes a step-by-step approach to several typical sessions, including adding fades to the end of tracks, and dealing with the problems of a single, long, live recording.

The Playlist appears beneath the Track view, and this is a text-based list of the audio regions, in chronological order. It contains the start times, end times, lengths and names of each region currently in your CD Project (as displayed in the Track View). You can click on any field and then edit it using the keyboard. You can also click on the row number (to the left of the actual data), and drag this up or down to a different position, to re-order tracks. It took me a few tries to get the hang of this — you first click on the desired numbered row and release the mouse button, and then click a second time and drag to actually move the track to a new position. This two-click approach allows you the

option of clicking and dragging across several rows to select multiple tracks, so that the second click and drag moves several tracks simultaneously. One minor bug report here — I managed to crash the program by dragging a non-existent track about (but my *First Aid 97* crash protection utility let me recover and continue with no further problems).

Beneath the Playlist is the PQ List — another text-based list, containing track IDs, sub-indices and markers in chronological order. Markers are not written to the CD; they simply mark any position for your own purposes. In addition to the information contained in the Playlist, the PQ list includes editable fields for copy protect flags, preemphasis flags and ISRC (Industry Standard

"CD Architect will write data directly from your hard drive to the CD, at the same time as calculating all the volume envelopes, crossfades and mixes in real time."

Recording Codes) data. You do all your editing in the same way: by clicking, dragging and keyboard entry. The final part of the screen display is the Transport/Master Panel, and this simulates the controls of a CD player, allowing you to play back tracks with all the pauses and settings of your proposed CD. The standard Play, Stop, Next, Previous, Fast Forward, and Fast Reverse buttons are provided, along with Continuous Play (Cycle)

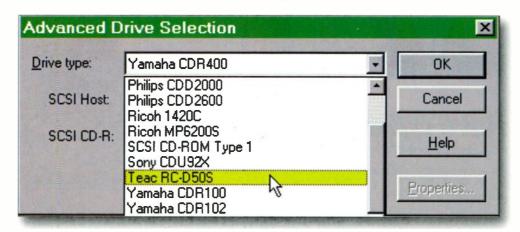
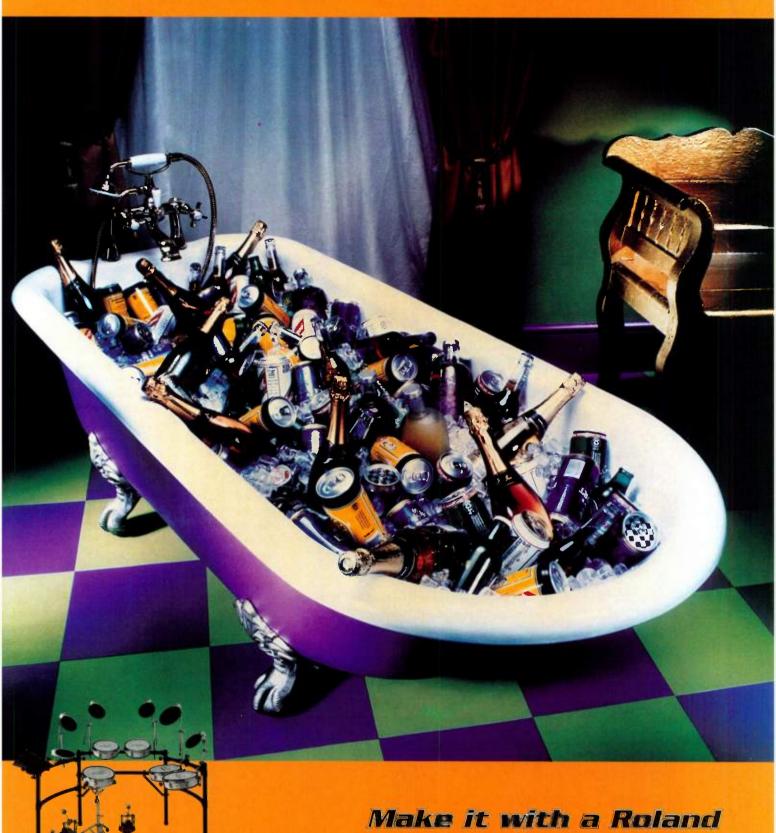


Figure 3: Before the burn can take place, you need to select a supported drive. There's a reasonably wide selection of drivers available, and many devices are auto-detected — look at the Sonic Foundry web site (http://www.sfoundry.com/pages/cdr.htm) for the most up-to-date list.

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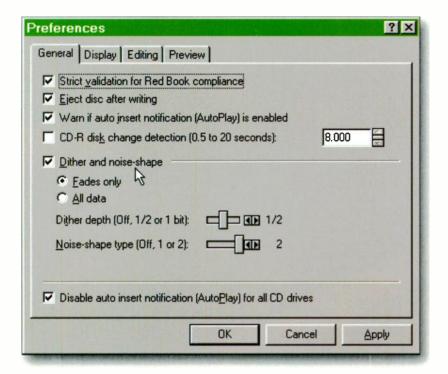




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SONIC FOUNDRY CD Architect



"Complex volume-adjustment envelopes can be created, and the beauty of these is that they are totally non-destructive, applied only during playback and when the CD is finally burned."

> ▶ and an extra button labelled Emulate CD. When Emulate CD is off, the Next/Previous Event moves between each start and end marker in turn; when it's on, the Next/Previous Event acts just like a real CD player, jumping between track starts. Track and index indicators are also shown, and these are exactly what the display of a CD player will show when it plays your CD. The final components in the Master panel are two Master Faders, which

ARCHITECTURAL DETAILS

There are lots of little programming touches in CD Architect that make things easier to use. Multiple Undoes allow you to backtrack if things go wrong, without constantly having to back up your files at each stage. If you're dragging an object, such as a marker or track, when you get close to any other object, there's the software equivalent of a pot 'detent' — the moving item is gently pulled so that it clicks into place, exactly lining up with the other object. Sonic Foundry call this 'Drag and Drop Snapping'. Another nice touch is that the speed of fader alteration is determined by how fast you move the mouse once you've 'grabbed' the faders. Although you can quickly

change the value by tens of dBs, once you approach the required value, slowing down your 'drag speed' lets you edge to the final value in tenths of a dB.

There's even a preference option for adjusting Un-mute time. Most CD players avoid clicks when jumping to other tracks by quickly fading in the track over, typically, 50ms (although some in-car systems may take up to 300ms). If you want to avoid some players missing the start of your tracks, CD Architect simulates Un-mute fade-up. This kind of attention to detail makes day-to-day use of an application a joy, and these are the sorts of things that result in an intuitive interface, which seems to anticipate what you want to do without ever taking over.

Figure 4: This screen, left, gives you an idea of the many options available — notice that you can apply noise-shaped dither to all fades, or even to the entire audio project.

allow overall levels to be set for the entire CD. These affect monitor levels as well as the final levels written to the CD, and a readout of their current settings appears beneath the faders, calibrated from +20dB to -Inf (Infinity).

IN USE

Once you have several items in the Audio Pool, and have dragged them into the Track View window, operation is fairly intuitive. If you have a long recording of a live performance to which you want to add track starts, you can insert additional ones at the current cursor position by right-clicking on the tab line and choosing the Insert option. Adjusting the gaps between tracks is simply a matter of dragging the waveform left or right until the pause sounds just right, and you can shift-click multiple tracks — for instance, adjusting the gap between tracks one and two while all the subsequent tracks move a bit to the right.

Once you move the cursor near the centre line across each waveform, it changes to a small hand, and you can then alter the overall volume of the track, in 0.1dB increments. If you grab one of the two small squares at each end of the line, you can alter the level of one end of the track relative to the other; or, by shift-clicking anywhere along the line, add an additional point to create a fade in or out. Complex volume-adjustment envelopes can be created, and the beauty of these is that they are totally non-destructive, applied only during playback, and when the CD is finally burned. This means that the actual track data remains unchanged, which not only speeds up the editing process, but means that you're not constantly worrying about backing up your music data before attempting to tweak another fade.

What will impress most people even more is that if you grab an entire track and drag it so that its start overlaps the end of the previous one, a real-time crossfade is automatically created, again without altering the data of either track. This is one of the best implementations that I've seen on the PC. I've seen crossfading done using a 4-track Macintosh package to accommodate the overlap of two stereo track pairs, and also using a stereo Mac package with most of the RAM acting as a crossfade buffer, which limits the length of the crossfade to the amount of memory in the machine. CD Architect has no such limitations.

The one thing that caused me confusion initially was having both a Playlist and PQ List, with many duplicated fields. This does give more versatility, since the PQ list can contain many more entries if you insert additional track indexes part way through a single audio region, but, until you work through the supplied tutorial, it can be confusing. The thing to remember is that the Playlist is associated with the waveforms, and the PQ List with the markers. I mostly worked direct with the Track View, using

the Playlist for changing the track order, and the PQ list for adding extra Track indexes.

CD BURNING

Once you have your audio data assembled, with the appropriate inter-track gaps or crossfades, burning the CD follows the same path as in most other packages. There are test modes to verify compliance with the Red Book standard, which also allow a 'dummy run' before the actual write: then, as long as your PC is powerful enough, CD Architect will write data directly from your hard drive to the CD. at the same time as calculating all the volume envelopes, crossfades and mixes in real time. Sonic Foundry recommend a Pentium and a minimum of 8Mb RAM, but are no more specific than that. If you already use your PC for hard disk recording, you should have no problems with real-time CD burning; even with a less powerful machine, you still have the option of creating an image file (if you have about 600Mb spare on your hard disk) which will incorporate these real-time operations, so that the final burn can still be carried out.

SUMMARY

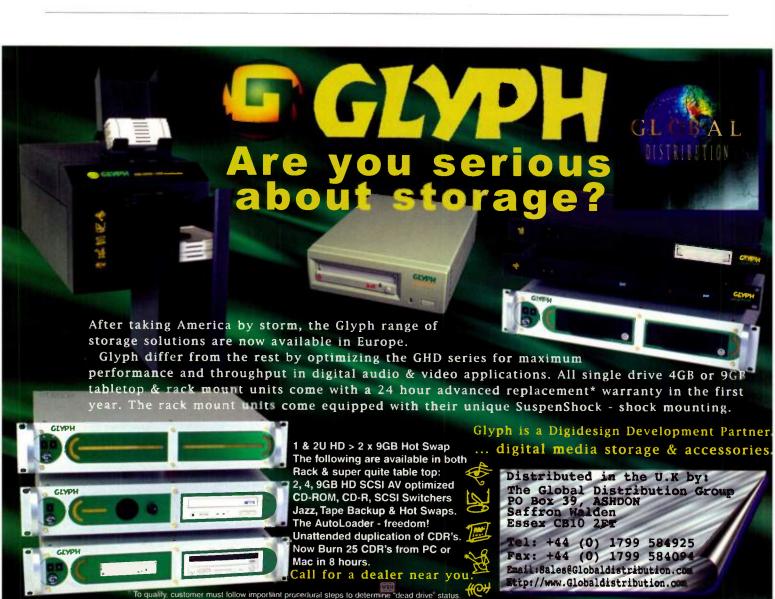
This is a lovely package. Once you have either read the manual, or followed one of the supplied

tutorials, most operations are fairly intuitive. At £259 for a stand-alone application, this is far and away the cheapest 'professional' audio-CD-writing package on the market. WaveLab 1.6 is currently £399, and Red Roaster is £500 in its 16-bit version, and £700 in the full 24-bit version. I can't help feeling, though, that existing Sound Forge 4 owners would have preferred a cheaper 'plug-in only' version.

The graphics of *CD Architect* are a lot more integrated than *WaveLab 1.6*'s, which the 'click and drag' brigade will prefer, but both packages are an all-in-one solution, rather than the two-stage process of *Red Roaster*. However, if you want easy fades and crossfades, and prefer to leave your tracks unedited so that they can be recompiled for other projects, the real-time nature of *CD Architect* takes some beating.









Masterport v2.4 provides a true pro-standard recording and editing environment.

> to that used by the more expensive Creamware TripleDAT system; the board can be thought of as two audio cards in one: stereo digital and analogue signals can be input and output discretely in parallel, to give 4-channel operation, with the digital S/PDIF connectors switchable between optical and co-axial. The analogue signal chain is exceptionally quiet and sweet-sounding, with high-quality, goldplated RCA phono connectors used rather than the more usual mini-jacks - full marks to Creamware here! The Triple board consumes only minimal PC resources and requires only a single interrupt setting (IRQ) and a single

CREAMWARE MASTERPORT v2.4 HARD DISK RECORDING & EDITING SYSTEM

The Masterport system consists of dedicated multitrack software and a high-quality card, allowing you to avoid the compatibility problems that can arise when software and hardware from different manufacturers are run together. JANET HARNIMAN COOK thinks it's the cream of the crop.

> reamware Masterport v2.4 is an integrated multitrack audio recording and editing system for Windows 95 PCs, consisting of the Masterport software and the excellent Triple audio card. Because the Masterport hardware and software are specifically designed to run together, not only are the compatibility problems that sometimes arise when you're using soundcards and software from different manufacturers avoided, but also a higher level of functional integration is possible than can be provided by the basic Windows MME specification. Masterport 2.4 is capable of simultaneous 16-bit 4-channel recording and playback on up to 16 mono or stereo virtual tracks, and sampling frequencies of 32kHz, 44.1kHz and 48kHz are supported, although all samples within a Masterport project must share a common rate.

The Triple board used by Masterport is identical

memory address for all of its MIDI and audio activities - and as it is MME-compatible it can be used with any Windows audio application. Audio can exported as Windows WAV files from Masterport, and WAV files may be imported, but are converted to the Masterport proprietary format with a full duplicate of the sound data. The positive consequence of this is that on-line editing in Masterport is non-destructive; the downside is that you need lots of hard disk space if you wish to retain the original audio file, and in practice it's a good idea to have a hard disk devoted to Masterport (a fast 2.6Gb EIDE drive should do the trick.)

THE PACKAGE

The Masterport package contains the application setup files on two floppy disks; the Triple board; a co-axial audio and MIDI I/O interface cable; an infra-red DAT remote sensor cable; the User Guide; and the Masterport registration documents. The User Guide is a bulky, 300-page, loose-leaf binder written in a readable, often humorous style, and includes installation instructions, a troubleshooting chapter, an index, and tutorials, together with a wealth of fascinating information covering every aspect of Masterport, along with useful advice on mastering and dialogue editing for broadcast and AV work. Further assistance is available in the form of comprehensive on-line Windows help, or via the Creamware web site and the technical support line of the UK distributors, System Solutions.

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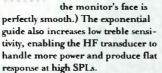
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Like biamped

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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





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ducer cone and reach your ears. The typical problem of small-monitor midrange "boxiness" is eliminated.

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The Mackie HR824 Active Monitor. ±1.5dB 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.

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The HR824's front board has "radiused" edges to further eliminate diffraction; an "H" brace bisects the enclosure for extra



Fig. D: HR824 alloy dome's accurate pistoni 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.

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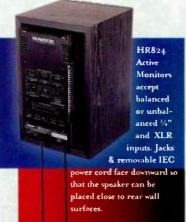
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Creamware Masterport v2.4

pros & cons CREAMWARE MASTERPORT v2.4 £599 pros · Easy to use. · Great value for money. . Outstanding audio quality. • Integrated hardware and software avoid compatibility problems • Excellent optional real-time DSP effects and audio renovation plug-ins. Limited onboard DSP effects. . Demanding on RAM and hard disk space. . Needs more shortcuts and DirectX not supported. • Needs multiple Edit Undo. summary Masterport v2.4 offers an excellent, lowcost, integrated Windows multitrack recording and editing solution that can be recommended for both smaller studios and AV/multimedia production facilities. SOUND ON SOUND ▶ review period Masterport proved stable and performed well. It will take new users a little time to become familiar with the Masterport way of doing things, but once the initially steep — but mercifully brief — learning curve has been overcome, working becomes fast and enjoyable. The cherry on the top is that copy protection is avoided, as the Masterport software only operates with the Triple board.

USER INTERFACE

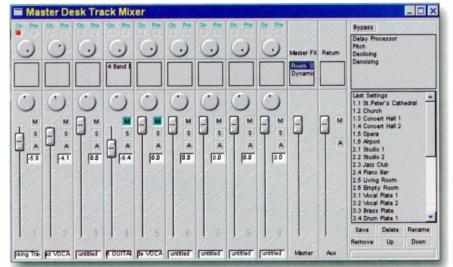
Most activity in Masterport takes place in two main windows: the Arranger, as its name suggests, is where the audio segments, known as Samples, are assembled in linear sequence across the 16 tracks; sample-accurate editing takes place in the Cutter window. Masterport windows and dialogue boxes are generally clearly laid out and functional, but initially appear rather grey. This is due to the limited use of colour, although more adventurous users can customise colours by editing the arg.ini text file found in the Masterport folder file, but beware: this is a cumbersome tweak and requires prior calculation of the RGB values!

Masterport 2.4 is intensively mouse driven, with frequent use of right mouse button-activated pop-up option menus — the golden rule in Masterport is 'if in doubt, click the right mouse button'. There are relatively fewer keyboard shortcuts in Masterport than are typically found in other Windows audio applications, nor does Masterport always follow conventional Windows shortcut conventions (such as fast save with Control + S). Being a bit of a keyboard fan myself, I was initially apprehensive about being able to get up to speed, but the shortcuts that have been implemented are well chosen, and despite all the 'mousing about', getting around became quick and easy once I gained familiarity with Masterport routines. One point to note is that Masterport dialogues should always be closed using the confirmation button — changes will not be saved if the dialogue title bar X button is used.

GLOBAL CONTROL

At the top of the Masterport workspace are the Drive Control transport panel; the Control Panel

The Masterport Track Mixer displays the playback status and effects routing for each track.



PC REQUIREMENTS

Creamware recommend a minimum DX 2-66MHz processor with of 16Mb RAM and a fast EIDE PCI (or SCSI) hard drive, but significantly better performance will be obtained with a Pentium 100 or better and 32Mb of RAM. The reference PC is an Intel Pentium 200 with VX motherboard, 256K pipeline burst cache, 48Mb of RAM and a 2Mb Trio+ PCI graphics running 1024 x 768 pixels in 64K colour mode on a 17-inch monitor. The MIDI interface used is a Mark of the Unicorn MIDI Express external unit connected to the PC parallel port.

Windows 95 Build B implements 32-bit FAT to accommodate hard drives of over 2Gb and although this saves hard disk space by using a smaller cluster size, the disadvantage is that the hard disk has to work significantly harder and may slow down, causing performance loss in some HDR applications. To minimise this, go to

Computer/Properties/Performance, and reset File system/Hard Disk read-ahead optimisation and Graphics/Hardware Acceleration to None.

containing shortcuts for file, synchronisation and snap functions; VU meters; Time display; DSP usage indicator; and the very impressive real-time global pitch-shift control, which allows up to plus or minus 50% speed adjustment and may be used in the same way as the varispeed function on conventional tape recorders. Below are the Markers bar, and the Ruler, which can display Meter, Time, Data blocks or SMPTE frames.

Magnification functions can be accessed from the Zoom icons, from the numeric pad + and - keys; or by dragging on the scrollbars — the horizontal scrollbar re-scales the time axis and the vertical scrollbar controls amplitude magnification. Navigation would be even quicker if Masterport could store screens as snapshots, as is possible in Steinberg WaveLab and Sonic Foundry Sound Forge, but fortunately Masterport has a powerful and versatile marker system which can be used to identify or select audio sections and to recall edit points these markers may even be used to sequence your DAT player — full marks for this level of studio integration! Markers can be entered easily during playback, by pressing Keyboard M, and repositioned by dragging. Double-clicking on the marker head opens the dialogue box which enables you to rename, lock, fine-position and associate remote control commands for your DAT machine. The Track Mixer is where the playback status for each track is defined, with settings for effects routing, mute, solo, group assignment, pan and level offset. Masterport v2.4 is unusual amongst dedicated audio editors as it provides a metronome function — the tempo can be set from the Control panel and can be assigned to play through the PC speaker or via a MIDI device, although in a multiple-PC MIDI port setup only the base MIDI port can be used. Additionally, Masterport can also import and play a MIDI file — but, again, only single-port playback is possible.

THE ARRANGER

Audio files appear on the Arranger window tracks as rectangular Sample blocks containing a graphical waveform display. Samples can be selected individually or as a group for editing, and









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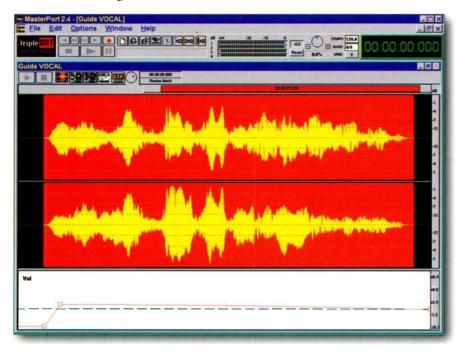




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Creamware Masterport v2.4



The Cutter window is the Masterport sample editor and features sample-accurate editing, audio scrub, and volume curve mapping.

locked to prevent accidental repositioning — Masterport terms this 'freezing', and the cursor icon changes into a very cute little snowman as it passes over a frozen sample! The selection can also be defined by time and appears as a red block on the markers line above the ruler. Samples may be fast-edited in a variety of ways: dragging the centre of the vertical borders of the Sample edits its length; dragging the upper corners of a Sample creates fades: crossfades are automatically created when two samples in the same track overlap, and double-clicking on the crossfade area opens a dialogue box which gives a choice of five fade envelope types. Track output, offset, mute and name can be quickly defined from the track information panel to the left of the pane, and multiple samples, even if placed on different tracks, can be merged (mixed down) to form a new Sample or exported as a WAV file. The Arranger window has its own Toolbar, which can be repositioned anywhere on screen, and contains icons for the Loop, Shears (Sample cut tool), Remove Sample, Loop, Freeze and Zoom tools, plus shortcuts to the Track Mixer and to the Sample Manager (which is where the audio files that are in use by Masterport are listed).

TRIPLE BOARD BRIEF SPEC

- PC ISA card
- 4 channels in/4 channels out, configured as two discrete analogue and digital stereo pairs.
- Sampling Frequencies: 48kHz; 44.1kHz; 32kHz.
- Analogue input/output: unbalanced stereo linein/line-out on RCA phono jacks.
- Digital input/output: optical S/PDIF (TOSlink)/co-axial S/PDIF, unbalanced 75Ω RCA phono jacks/optional AES/EBU, transformer-balanced 110Ω XLR.
- MIDI Interface: In/Out
- Time Code Input/Output: MTC or MIDI Clock.

- Analogue-to-Digital Converter: 18-bit, 128x oversampling.
- Digital-to-Analogue Converter: 18-bit, 128x oversampling.

The Triple board is also used by Creamware's
TripleDAT system (£1249 including VAT; £1395 with
AES/EBU option), which is functionally identical to
Masterport but has the following additional features:
Red Book CD writing; 256 virtual tracks; real-time
DSP effects processing including Warp Mode (live
throughput); Pan curves; Spectrum Analyser;
Correlation Metering; Time Stretch and
DAT-streaming archive/backup software.

RECORDING

Recording is straightforward, and Masterport is well suited to live recording, with excellent, easy-to-use multi-take and overdubbing routines. Although all audio files used in a Masterport project must share a common sample rate, most projects will, in practice, be 44.1kHz, and when recording from a 48kHz source such as consumer DAT, Masterport helpfully provides automatic sample rate conversion. Once you enter record standby the incoming signal is displayed on the output VU meters, but as Masterport has no analogue input level attenuation you must adjust the output level of your source device (your mixer, tape deck or keyboard). When placed in the Arranger window, the newly recorded sample retains its timing relative to the rest of the tracks, and there is no need to name the Sample prior to recording, as Masterport does this for you automatically, and you can rename the Sample later from Sample Settings.

THE CUTTER

The Cutter window is the Masterport sample editor, and features sample-accurate editing, audio scrub, and volume-curve mapping. Areas of selected audio can be processed; defined as a Region (cut file) and added to the Arranger; or exported as a WAV. Oddly, the Cutter window lacks a time ruler and it can occasionally be difficult to recognise individual sections of audio without recourse to the scrub function, even though markers are carried through from the Arranger window and can be added in the Cutter.

Situated beneath the Cutter waveform display is the Volume Envelope pane: complex level envelopes can be constructed by creating a series of gain-change points, or curve nodes; these may be one of six types (logarithmic, linear, or polynomial 1-4). Entering the Cutter during multitrack playback allows you to adjust the Volume Envelope in real time, and with multiple Cutter windows open it is even possible to edit the levels of several tracks on the fly. The Cut List stores up to 256 selection blocks and enables you to undo edit changes by recalling previous settings, but I found the Cut list rather unwieldy, and similarly I missed the simplicity of editing using conventional Windows cut and paste routines. I was also puzzled by the absence of a Snap To Zero-Crossing function, even though Masterport has an automatic cut de-glitcher in the Audio Settings/Smooth Cuts function.

EFFECTS PROCESSING

Masterport ships with five WaveWalkers DSP effects modules: delay; dynamics (compressor, gate, expander, limiter and de-esser); pitch-shift; room simulator and a 4-band parametric EQ. The equaliser operates in real time, allowing you hear the changes in parameter settings as you make them. The other modules are off-line processors — the effect parameters are determined, processing is applied to the soundfile, and the results can be heard during playback. The lack of an audition function for the off-line modules makes processing a bit hit and

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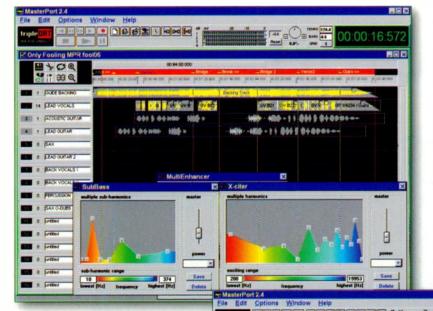
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Creamware Masterport v2.4



to MIDI Clock or MTC (MIDI Time Code). Masterport will act as the master clock source and transmit timing information for the control of slaved devices; alternatively, it can act as the slave and respond to an external clock source. I set up Cubase to slave to Masterport via MIDI Clock and it worked — well, like clockwork, with rock-solid lock-up throughout. Synchronising to SMPTE via MTC was similarly hassle-free, and timecode played back from a VTR audio track required only minor SMPTE offset adjustment in the Masterport Synchronisation dialogue.

CONCLUSION

In use, Creamware's Masterport v2.4 proved a stable, competent performer, and such reservations as I might have are relatively minor. Its recent

> Rock solid: **Cubase Audio** XT slaving to

Masterport.

Above: Masterport v2.4 in 16-track mode running the real-time enhancement modules from the optional Osiris plug-in suite.



Above: Masterport provides a wide range of playback and synchronisation options.

3RTime 2V In 5R2 Tim 6V2 7>>

> that can be safely recommended. £ Creamware Masterport 2.4 £599; with AES/EBU option £749; Osiris audio restoration plug-in suite £395; FireWalkers real-time

miss, until you get to know the WaveWalkers' characteristics, but to help out you can save your tweaks as presets. Although the audio processing of the on-board modules is of a consistently high quality, unfortunately Microsoft's DirectX audio plug-in architecture is not yet supported, and it is consequently not possible to use third-party plug-ins; however, all is not lost, as Creamware's own excellent optional real-time plug-ins can be used to augment Masterport DSP editing muscle: the Firewalkers DSP suite contains an 8-band EQ. Chorus, Flanger, Pan Modulation, Dynamic Pitch Shifting/Transposition and a remarkable set of professional audio measurement and analysis tools: and the Osiris audio restoration suite is a superb collection of top-quality audio renovation tools that includes real-time noise reduction, de-clicker, decrackler, sub-bass enhancer, harmonic enhancer and spectrum analyser.

SYNCHRONISATION

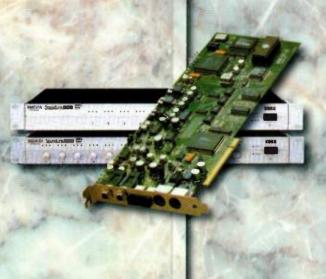
Although not supporting Windows AVI playback, Masterport v2.4 provides two-way synchronisation

re-launch and revised pricing structure mean that Masterport represents excellent value for money. The synergy created by the very fine Masterport software and the Triple board — one of the best audio cards currently on the market — provides a true pro-standard recording and editing environment 505



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WITH YOUR PC MARTIN WALKER dons his white lab coat and explains the advantages of knowing a little more about DOS

efore you turn the page to avoid being accused of being a closet anorak, spare a few moments to find out why having a basic knowledge of DOS commands could help you. Many people buying PCs nowadays are almost unaware of DOS (the Disk Operating System), since it is normally bypassed when loading Windows 95. However, it's still there underneath, and knowing how to find your way around in the murky world of the Command Line Interface (CLI) may one day enable you to launch a disk fixer program if you ever get problems with your hard drive, or manually put right some tricky problem that prevents Windows 95 from appearing on your screen.

and the Command Line Interface.

Windows 95 has largely removed the need to do anything but 'point and click'. You could think of Windows as like using the lift in a large office building — you decide where you want to go, press the appropriate buttons, and then the 'behind the scenes' machinery whirs into action. Normally, when Windows 95 is up and running, you also use the lift, since pressing a single button will get you where you want to go. However, if the lift breaks down the only solution is to use the stairs, and take things a step at a time. Each step is the equivalent of a single DOS command.

2 Microsoft Windows 95 Resource Kit Help Lopics Back Options Command-Line Commands Summary Native Windows 95 Commands attrib2 Displays or changes file attributes Sets or clears extended CTRL+C checking break cdı Displays the name of the current directory or changes the current directory Displays the number of the active character set (code page). You can also use this command to change the active character set for all devices that support character-set switching. chcpi chdire See the cd command Checks the status of a disk and displays a status report. Can also fix disk errors. However, Windows ScanDisk (scandskw) chkdska is the recommended command for repairing disks command₂ Starts a new instance of the command interpreter соруг Copies one or more files to the location you specify Changes the terminal device used to control the computer ctty date Displays the date and prompts you to change the date, if Compresses hard disk drives or floppy disks, and configures

Figure 1: The Windows 95 CD-ROM includes full details of every available DOS command for reference. You can find these in the Appendices section of the file E:\ADMIN\RESKIT\HELPFILE\WIN95RK.HLP

IN COMMAND

Anyone who has ever seen a computer terminal as used in a feature film will know at once what to expect from DOS — close-ups of frantic tapping on the keyboard, followed by pressing the Return key. In the world of Hollywood, this always results in wonderful screens full of text and numbers scrolling into view, while everyone looks on with suitably enigmatic expressions and pretends to understand what's going on. Still, it's a fairly accurate representation of DOS.

When in DOS mode, you still have full control of all basic functions, such as the launching of programs, and all aspects of file management. However, instead of the point and click interface that we now take for granted (more accurately

"DOS was first introduced way back in 1981, when few personal computers possessed hard disks, and floppy disks were really floppy and of the 5.25-inch variety."

known as the GUI, or Graphic User Interface), DOS uses a Command Line Interface (CLI). This is so named because each command is entered as a single line of text, after which you press the Return key (an abbreviation of Line Return, much like the carriage return of a typewriter) to carry it out.

The core of available commands is contained in a single file named COMMAND.COM, which you will still find on every PC today, and this is loaded into memory during the boot-up process. The reason why DOS can carry on when Windows is

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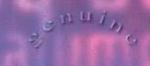
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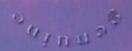
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"Even absolute beginners will find it difficult to get a bad sound out of the MX30.

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Paul White sound

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USING DOS COMMANDS WITH YOUR PC

▶ falling about your ears is that once the PC has finished booting up to the CLI, the contents of this single file, and the code inside the BIOS chip, are all that is needed for the majority of simple commands. There are no conflicts with the hundreds of additional files which get involved when Windows is running. Sometimes, when there are conflicts within Windows which prevent it from booting up properly, going into DOS to run a utility or carry out some basic maintenance work is the only way to sort out the problem.

SAFETY NET PROVIDED

If you run the 'MS-DOS Prompt' from the desktop or Start Menu, you're actually running DOS in a separate window, and Windows 95 is still lurking in the background, like some over-zealous nanny. If you need to get back to Windows 95 from inside a DOS window, the command to do this is EXIT (type 'EXIT', and then press the Return key). If you want to switch from being in a window to full-screen immersion, press and hold the Alt key, and then use Return to switch between the two screen modes. This may

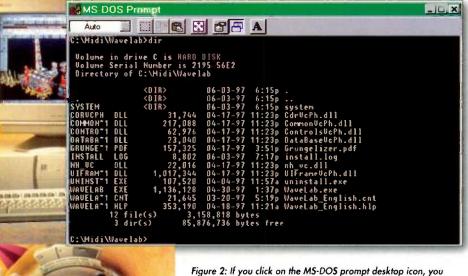


Figure 2: If you click on the MS-DOS prompt desktop icon, you enter a DOS session supervised by Windows 95. Here I have typed DIR (the Directory command), which shows the contents of the current directory. Note that the contents appear alphabetically sorted (see main text to find out how this is done), and that the C: prompt also shows which directory you're in (C:\Midi\Wavelab>), which makes it far easier to see where you are in the hierarchy of the hard disk structure.

take a few seconds if you have a multisync monitor. However, even if the DOS window is maximised in this way, the rest of the Windows 95 graphical interface is still there, beneath the surface.

To enter the unfettered world of stand-alone DOS, press the F8 key when booting your PC (when you see the 'Starting Windows 95' message), and choose the 'Command Prompt only' option. You could also choose 'Restart Computer in MS-DOS Mode' from the menu that appears when you're about to shut down Windows before switching your PC off. Both these actions will cause Windows support to be entirely removed. If you're in stand-alone MS-DOS mode, and not yet running Windows at all, you can type WIN to start it up.

A FILE WITH A VIEW

Before we go any further, one potential source of confusion needs to be explained. Although Windows refers to files being placed in 'folders' (to extend the visual analogy for its graphical interface), DOS refers to these as 'directories' (as in Directory Enquiries). These two terms are synonymous. It should now be more obvious why the DOS command to show the contents of the current part of the drive is DIR (Directory). If you can't wait to try something, nip into a DOS window by clicking on the MS-DOS Prompt option on the Start menu, and type 'DIR', then press the Return key. Easy, isn't it? (note that, with all the DOS commands I'm about to cover, you don't have to type in the single quote marks you see on the page here. They're just to differentiate the commands from the rest of the text.)

If you're in a large directory, screens full of data will flash by. That's what Hollywood thinks computers should do, but it doesn't make it very easy to find a particular file. If you're very quick, you can use the Pause key (above the cursor keys) or Ctrl+S (hold the Ctrl key and then press S) at exactly the desired moment, to stop the screen from scrolling any more, and then press any other key to resume. If you want to escape from a vast scrolling morass of files, use Ctrl+C, or Ctrl+Break.

Most DOS commands have a help feature. which you can access by typing the command, followed by ' /?'. For instance, to see all the options available for viewing the contents of the current directory, type 'DIR /?' (with a space between the two parts). Although the resulting page looks complex, there are two options that I often use. The '/O' option sorts the files into alphabetical order before displaying them, which makes finding a particular one far easier, and the '/P' option pauses after each screen full of entries, to give you time to read them (pressing any key continues to the next screen). So typing 'DIR /O/P' will give you neatly ordered screens full of files much easier. Later on, we will see how you can automate this by modifying a batch file.

If you're trying to locate a particular file, which, for instance, starts with the letters MSD, typing 'DIR /S MSD*' will not only look in the current directory for all files starting with these letters, but will also (because of the /S) look in all subdirectories (inside the current one). The 'star' symbol (above the '8' key) is known as a wild card, since it ignores anything after the fixed filename that precedes it — so it will find files such as MSDRAW.EXE and MSDOS.SYS, as well as the desired MSD.EXE. The same system applies to Windows 95 programs like 'Find'.

POTTERING ABOUT

Now that we know how to view the contents of a directory, we need to be able to move from one to another. This is done using the CHDIR (Change Directory) command, or the more usual shortened form 'CD'. CD followed by a name will





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USING DOS COMMANDS WITH YOUR PC

▶ take you to a particular directory, so 'CD WINDOWS', for example, would move you to the WINDOWS directory. To move up to the next directory in the hierarchy, type 'CD...' (two dots), and to move up two directories in the chain, type 'CD...' (three dots). To move right back to the root directory (so that you are no longer inside any sub-directories), type 'CD \text{V} (the backslash symbol is on the key immediately to the left of the Z key). If you want to search the entire hard drive for particular files, first get to the root directory using

distinguishes different types of file, such as .MID for MIDI files, and .TXT for text files. Although Windows 95 allows much longer filenames to be used, these will be truncated to eight letters or digits when you are in DOS, so that, for instance, the 'Program Files' folder of Win 95 will appear in DOS as PROGRA~1. This does make moving around a bit harder, because if you want to get inside this directory you have to type the truncated name as DOS shows it, rather than the full name you know and love. However, DOS is impervious to whether you type in upper or lower case, which does save a bit of time.

"In 1997, with Windows 95, and most people running at least 16Mb of memory and a minimum of a 1Gb hard disk, DOS is still there, and its little flashing C:> prompt is still available to those who need it."

DRIVING

Over the years, various conventions have evolved: the floppy disk drive is always A: (and this is the drive that the PC will normally attempt to boot from, before trying the hard drive); the B: device is still reserved for a second floppy drive; and the C: drive is normally your main hard drive. Any additional drives are allocated drive letters on a 'first come, first served' basis. It is perfectly possible to have up to 26 drives in total, with each being given a unique letter of the alphabet. So, if you want to see what's on a floppy disk, either type 'A:' to change to this drive, and then 'DIR' to see its contents, or type 'DIR A:' to combine both operations into a single command, which will show you the contents, but still leave you on the original drive. Using these basic commands, you can look for files in any directory on any drive, which you might well need to do to find and start a DOS program when Windows is proving troublesome.

The PATH command will show you which directories are automatically searched if you want to start another program. When you want to start a program or use a command, you can simply type in its name and press Return, but unless DOS finds it in any of the directories included in the current PATH, you will get a 'Bad Command or Filename' error message. Normally, the directories included are WINDOWS, and WINDOWS\COMMAND. If you need to start a program that is not in either of these directories, you must either use 'CD' to first move to the directory in which the program is stored, or change the PATH so that this additional directory is included in the search path.

'CD \', and then use the DIR command with the /S option, as previously mentioned. So, for instance, to find every single MIDI file on your drive, you type 'DIR /S *.MID'.

Finally, to change to another drive altogether, type the drive letter followed by a colon. If your CD-ROM drive is normally drive 'D', you would type 'D:', whereupon the prompt would change to indicate that you were viewing the contents of this new drive. Remember that, if all else fails, once you have CD-ROM support you can completely re-install Windows 95 from DOS by moving to the CD-ROM drive, and then typing SETUP, if you can't get Windows to run normally.

Incidentally, only Windows 95 allows filenames longer than the '8 + 3' standard. Both DOS and Windows 3.1 stick to a standard layout for filenames: an initial name up to eight letters or digits long, followed by a dot, and then an 'extender' of up to three letters or digits, which

SPEED WRITING

Until a few years ago, specialist applications were still manageable enough to be written by a single programmer, which minimised potential problems that can arise when different people have to get their code working together. For DOS applications, program code was often written in Assembly language (which is a low-level language in which actions are carried out on Individual bytes of memory). This resulted in faster performance, since everything could be carried out directly by the program at a much lower level, rather than ferrying data between the many program modules used by most of today's much larger applications. This is also the reason why so many games stayed as DOS-

only versions for so long, since it is far easier to 'take over' the hardware directly, giving faster performance, without having to abide by the additional protocol involved in Windows programming.

Nowadays, dozens of people have to be employed on every project, each individual or team working on a specific area, and this allows much more complex products to be written within a reasonable time-span. Nobody has to re-invent the wheel, since every application can use the core of standard components already available in Windows for carrying out basic operations. This team approach does involve a lot of planning, and very tightly specified code, so that each section neatly integrates into the whole. However, occasionally, critical core parts of code are still written

'by hand' using Assembly language, just like in the old days of DOS. This can provide a boost to performance, especially with pieces of code that are being carried out thousands of times a second (such as WAV file manipulation), since every tiny bit of time that can be 'shaved' off each operation can give appreciable improvements in overall performance, allowing more real-time operations, or more simultaneous tracks. The excellent SAW hard disk recording package has always been renowned for its speed and number of available tracks, and this is because it used large chunks of Assembly language programming from the outset. As the Microsoft DirectX drivers have also shown, lower-level programming brings more performance benefits.

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USING DOS COMMANDS WITH YOUR PC

BACK IN THE MISTS OF TIME — MIDI IMPLEMENTATION

In essence, DOS (or more properly MS-DOS, since this operating system is what launched the Microsoft empire into an unsuspecting world) is what we all used to control our PCs before Windows came along. DOS was first introduced way back in 1981, when few personal computers possessed hard disks, and floppy disks were really floppy and of the 5.25-inch variety. Each floppy disk provided the huge storage capacity of 360K (don't laugh, even in 1990, when I got my first PC, 1Mb was still considered more than enough RAM for anybodyl). After the PC finished booting up into DOS, all you saw was the C: prompt, followed by a flashing cursor. To start any application you typed its filename, and then pressed the Return key. When you progressed to the dizzy heights of having your first hard drive (20Mb in my case), negotiating the hard disk was a matter of issuing a command to move to each different directory (or folder). If you

wanted to move a file from one place to another, you had to type 'MOVE', followed by the source and destination filenames — no click-and-drag niceties!

For some years after Windows 3.0 and then 3.1 was released, die-hard enthusiasts stayed with their chosen DOS operating system, because it was much faster than Windows (and still is, simply because of the extra overhead that provides the glossy point and click interface). Also, programmers writing for DOS were often still writing the whole package, rather than being able to rely on the host of ready-built routines provided by Windows. Although this made their job much more involved, it removed some of the possibilities for 'bugs', simply because the DOS product was self-contained, and did not have to work with a raft of other people's routines. Cakewalk (whose latest Pro Audio 6 incamation was reviewed in the August SOS) started life as a DOS-only program.

RUNNING

There are two types of DOS files you can run from the CLI, and which contain programs. Files ending in .COM are commands. COMMAND.COM contains many of the simpler commands in a single file, but there are many others, such as FORMAT.COM, which carry out one specific function. Those files ending in .EXE are executable files (explaining the difference would involve a long discussion of the limitations of running files in a single 64K memory segment, so don't ask). To start any DOS program, simply type the name of the program without the extender (the bit after the '.'). So to start the Microsoft Diagnostics Program (MSD.EXE) you type MSD followed by Return (you will probably need to do a 'CD\WINDOWS\SYSTEM' to get into the correct directory first).

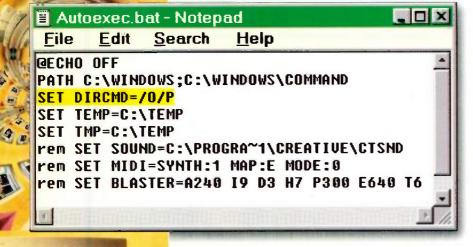
Although I have so far only mentioned text commands, it is perfectly possible for a DOS program to use graphics, and indeed there are

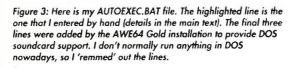
DOS programs available that mimic the Windows 95 'look' so perfectly that many people may be totally unaware that they are not actually running a Windows 95 program. Partition Magic is one such program (see Figure 5). Since it enables you to create and change the size of partitions on your hard disk (see review in April 97 issue) it has to be run from DOS, since the Windows 95 files will probably themselves need moving. The huge advantage of a DOS program is that it is totally self-contained, and does not need an arsenal of .DLL and other Windows System files to function properly. Since DOS programs nowadays are mostly run in times of crisis, the cosmetic graphics are normally the first to go, so that the program remains small enough to fit on a floppy disk. However, even programs such as Microsoft's Diagnostics, which use a blocky style of graphics that take only a tiny amount of memory, can still provide mouse support, and this certainly makes life easier for electronic rodent enthusiasts.

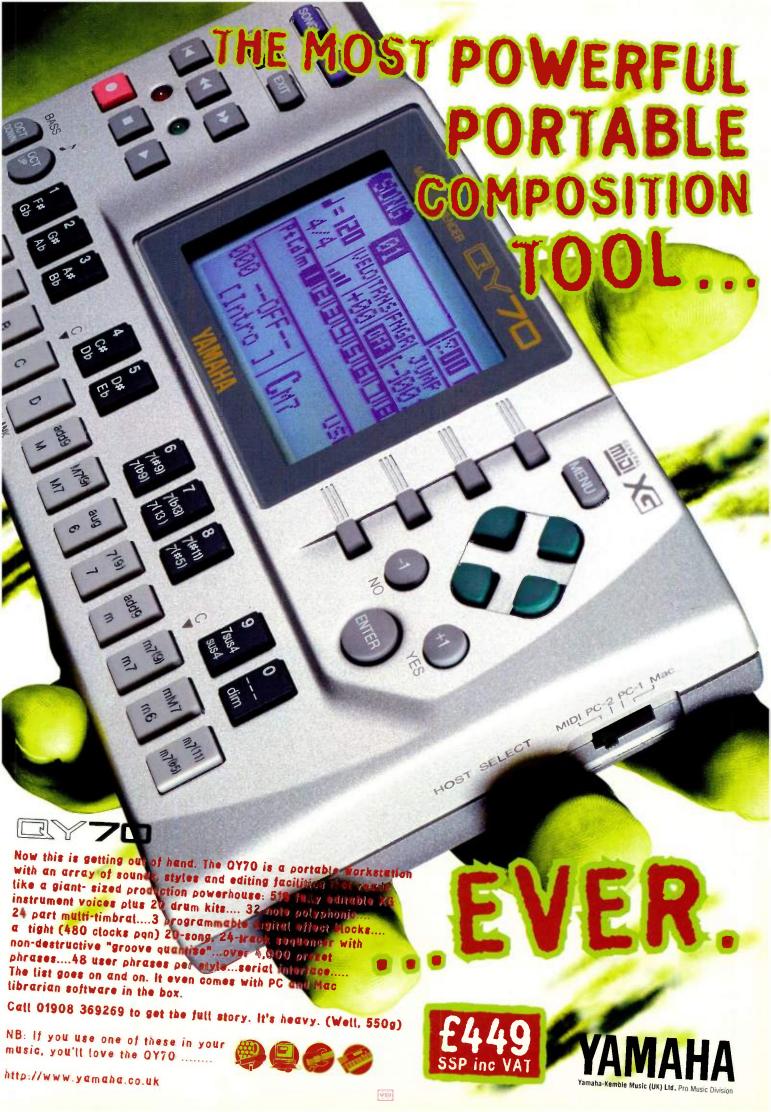
AUTOMATING

Batch files are simply small lists of DOS commands which are carried out one after the other, and whose filenames end in '.BAT'. Their main use was (and still is) to automate frequently used series of commands, which saves lots of typing. Before Windows came along, nearly all setup and install programs were batch files. Once the sequence of individual commands has been typed into a simple text editor program (such as Notepad in Windows 95), the resulting file is saved as NAME.BAT, where NAME is any meaningful eight-letter or eightnumber filename. Then, to carry out the commands, you simply type 'NAME' and press the return key. Since each line in these files is a single command, you can often achieve the same result by typing each line manually in turn and then pressing the Return key. There are, however, a few special commands that can only be used in batch files, and not through the CLI (all are documented in the Windows 95 file shown in Figure 1).

During the PC boot-up procedure, two such files are processed: AUTOEXEC.BAT, and a special file called CONFIG.SYS (a system file) which also acts in a similar way (who said Microsoft can't change its own rules?). Anyone who has been following my contributions to the PC Musician section of this magazine will have come across these files several times before, as they can be a vital part of your setup. Although CONFIG.SYS is not always needed by Windows 95, there are two main reasons for its presence: to provide drivers (small programs that are the glue between hardware and operating system) for any rare device that has no Windows 95 driver, and to supply drivers that may be needed when running DOS by itself, without the safety net of Windows 95. As we saw last month when installing a new hard drive, you may not be able to access your CD-ROM when outside Windows — this is a prime reason for a DOS driver to be loaded using the CONFIG.SYS file.







USING DOS COMMANDS WITH YOUR PC

BRIEF COMMAND DESCRIPTIONS

In all cases below details of the syntax (the order in which the command and elements that follow it) can be easily found while in DOS. To obtain more information about any command, type in the command name, as shown below, followed by '/' and text detailing all possible options will appear.

- CD (or CHDIR) changes the current directory, or displays the current directory name.
- CLS clears the screen, leaving the cursor at the top.
- COPY copies the files specified to the specified destination directory.
- DATE displays the system date and lets you amend it.
- DEL deletes the filenames you specify.
- DIR displays the contents of the current directory. However, unlike with Windows 95, there is no way to view 'hidden' files, which will not show up in a DOS session at all.
- DISKCOPY is useful for copying the contents of one floppy disk to another.
- EXIT returns to Windows, if this was running before the DOS session was started, or otherwise does nothing.
- MD makes a new directory with the filename you specify.
- MOVE is used in exactly the same way as COPY, but with an obvious difference!
- PATH shows the current paths that are searched automatically (see the 'Driving' section in the main text).
- RD removes (deletes) a specified directory.
- REM enables you to include comments (remarks) in a batch program, which either explain the function of another line within the file, or are added to temporarily prevent another command line from running.
- REN (or RENAME) renames the file or directory you specify.
- TIME displays the system time and lets you amend it.
- TYPE allows you to view the contents of a text file, and this can be extremely useful when browsing around in DOS.
- WIN starts the Windows operating system.



Figure 4: Here is a simple DOS application, in this case a utility for setting up an old soundcard, running inside a window under Windows 95. The blocky graphics may look primitive, but the entire screen display will only take up 1000 bytes of memory when running in its native full-screen DOS mode!

It's likely that the only time you will need to alter the contents of these two small files is when trying to solve hardware problems, especially after installing new hardware that insists on adding all sorts of extra lines to these files 'behind your back', during the installation. One of the main reasons why you might need to modify such a file is to add or remove a reference to a driver or other program (often related to soundcard operation). Sometimes when you're updating drivers, or installing new hardware, a text file will pop up to give details of any such manual changes required, although most installation procedures nowadays are completely automatic.

In the case of a piece of problem hardware, you may need to temporarily stop a driver from being loaded, to check that it is not the cause of the problem. If a README file that came with an application suggests temporarily disabling a driver to see if it is the cause of a problem, the easiest way to do this is to type in a 'Remark' command at the beginning of the appropriate line in the file. The abbreviation for this is 'REM', and adding these three letters will turn the entire line into a remark (often used in the old days to add a comment explaining what the hell the following set of commands were supposed to do!). The act

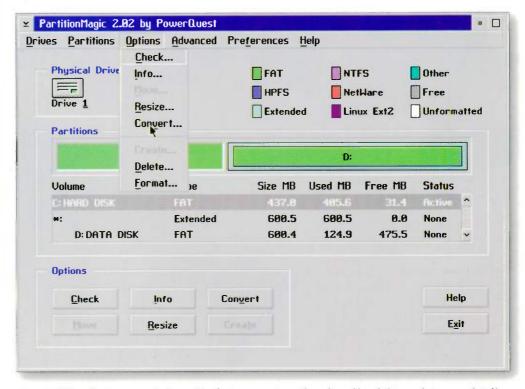


Figure 5: DOS applications are perfectly capable of using more advanced graphics, although this greatly increases their file size. Here is a version of Partition Magic, with all the usual niceties preserved, such as drop-down menus and mouse control.



"Sometimes, when there are conflicts within Windows which prevent it booting up properly, going into DOS to run a utility or carry out some basic maintenance work is the only way to sort out the problem."

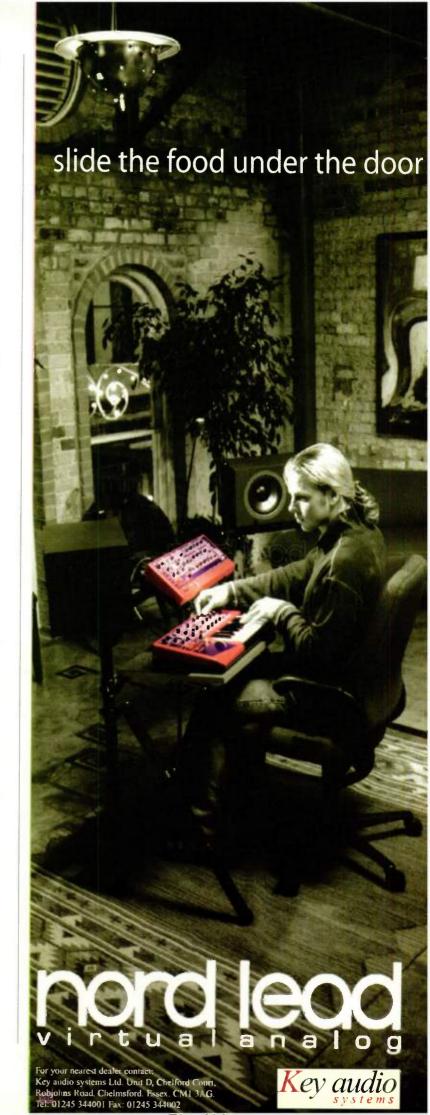
of adding this command became commonly known as 'remming', so that to stop the command line being processed you simply 'remmed' it out. Batch files can also be customised by removing lines, or adding extra ones, to set things up exactly as you like them. If you look at Figure 3 you will see a highlighted line, 'SET DIRCMD=/O/P', and I have added this in my AUTOEXEC.BAT file, so that whenever I go into DOS, all directory listings are alphabetically sorted and presented in neat screenfuls.

Many of the entries in these two setup files are now largely redundant if you have Windows 95 installed on your PC, since there are more sensible default settings, and few people use DOS by itself. It is perfectly possible to bypass these files altogether in many cases, if you don't run any DOS-only programs such as games. You can try this by temporarily renaming the two files to something like AUTOEXEC.BA\$ and CONFIG.SY\$, and then re-booting. If no problems arise from this, you will have saved a little booting time on a permanent basis. Their main use (to me anyway) is when they appear on the floppy startup disk, and load DOS drivers, for CD-ROM drives, for example (see last month's feature on installing a new hard drive). If anything untoward happens, simply rename them and re-boot once more.

THE HOME STRAIGHT

If you need to do some simple editing from DOS, there's a nice little program called *EDIT* (EDIT.COM, normally found in the WINDOWS\COMMAND directory) that's fine for basic tweaks. It also features full mouse support and Windows-like dropdown menus, and has its own DOS-style help file. Any amendments to your startup files can easily be carried out from here. Even if you have no intention of doing any editing, it's also a useful way to look at the contents of any drive, since its File Open dialogue box acts very much like the typical Windows equivalent, allowing you to whizz around the drive without typing anything in at all.

In 1997, with Windows 95, and most people running at least 16Mb of memory and a minimum of a 1Gb hard disk, DOS is still there, and its little flashing C:> prompt is still available to those who need it. I don't think that anyone, except a few die-hard 'back to basics' types, would like to go back to the days of DOS-only programs, although there is a certain elegance in a well-written DOS program, since without the bells and whistles we expect today it has the stripped-down speed of a greyhound. It might look primitive, but it's still a lot faster than Windows 95 when carrying out simple tasks.





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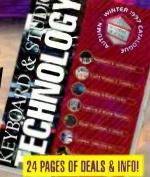
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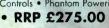
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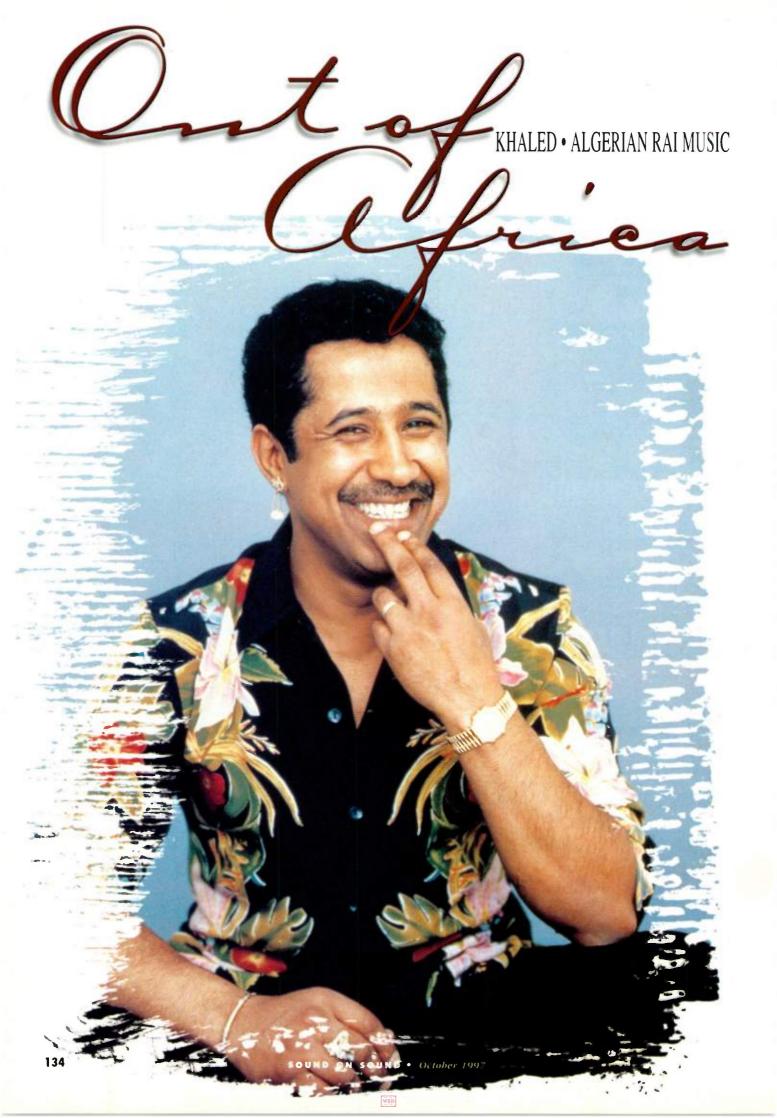
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For millions of people worldwide, rai musician Khaled is not just an artist, he's a phenomenon. PAUL TINGEN catches up with the elusive Algerian, and two of his many producers, to get the full story.

hough he's not too well known in the UK, rai musician Khaled (pronounce the 'kh' as 'ch' in the Scottish 'loch') is a phenomenon in the Arabic world, with a popularity that has reached almost surreal proportions. In 1992 his monster hit single 'Didi' sold over a million copies in European, Arabic and Asian countries, and made him more popular than Michael Jackson in India. This year he was also elevated to the status of nationwide celebrity and ambassador for the Arab minority in France, when his first French-language single, 'Aicha', put his brand of rai, a blend of traditional Algerian music and more Western styles such as soul, reggae and rock, at the top of the French charts for months, and sold 700,000 copies in France alone.

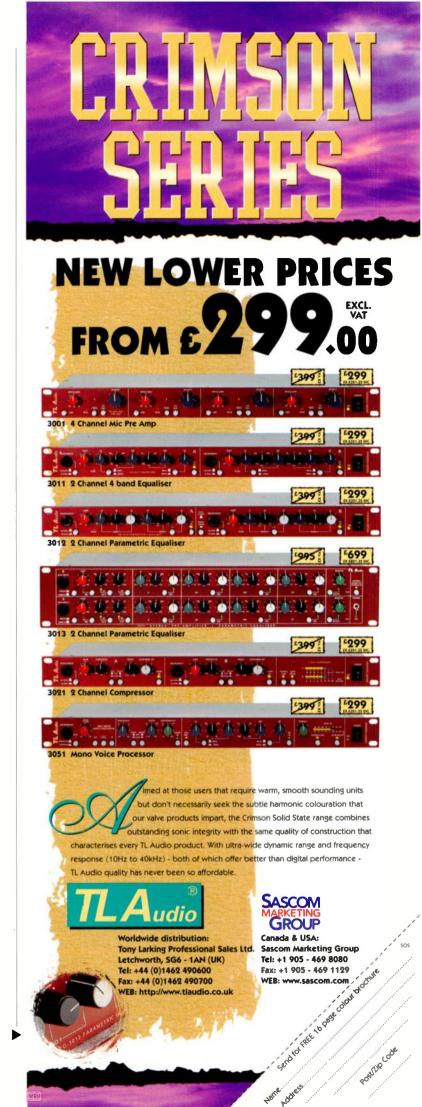
Time Out reviewer Peter Paphides, not usually given to using superlatives, called Khaled's most recent album, Sahra (1996), a work of 'celestial brilliance', and was bewildered that most Britons have never heard of the man, let alone his music. And the various people I interviewed for this article were all palpably thrilled to be given a chance to talk about their work with Khaled, clearly considering it one of the most unusual experiences of their lives. Don Was, the legendary American producer who produced 'Didi', described on the cover of Khaled's 1993 album N'ssi N'ssi how he appeared live with Khaled on the American late-night TV show Tonight in 1992. At least five of his friends called him the next morning, because they "found this quarter-tone funk so unlike anything they had ever heard before, that they were uncertain as to whether the entire show had occurred in their dreams."

ECSTATIC RESPONSE

Last May I had a chance to speak with Khaled, in the basement of his record company's offices in London. Khaled Hadj Brahim was born on February 29th, 1960, in Oran, an Algerian port, and made his first recording as a child prodigy atthe tender age of 14. Despite strong disapproval from his parents he had started to sing at weddings and cabaret evenings, and had begun to appropriate the rai, originally traditional Algerian music sung by women, and mix it with Western music and Western music technology. He continued to develop this new, electric rai under the name Cheb Khaled (Cheb means 'young'), and helped to start a whole new musical movement.

During the late '70s and early '80s rai music became the voice for Algerian youth rebellion, just as rock 'n roll was the voice of youth rebellion '60s and '70s. Rai is Arabic for 'opinion', and in it the singer presents his opinions on life, the universe and everything, though in the case of rai and Khaled, the universe rarely stretches much beyond love, women and alcohol. Despite this, Khaled created a song that became an anthem for womens' liberation, and continuously spearheaded calls for religious and cultural tolerance. It's easy to see why the religious fundamentalists took offence, and during the '80s and '90s rai singers have been assassinated with chilling regularity, most recently, and most famously, Cheb Hasni, who was killed in Oran in 1994.

Khaled, meanwhile, had been crowned the King of rai during the '80s, releasing his music in a fashion that was typical for African and Mediterranean countries during that time: on compact cassettes. Because Algeria used to be a French colony, strong ties remain between the two countries, and when Khaled made his European live debut in France in 1986 he got an ecstatic response. Becoming more and more nervous about political developments



KHALED • ALGERIAN RAI MUSIC

Khaled's eponymous album

(1992), the first album recorded with Don Was.

in Algeria — he feared for his life — and seeing new creative and commercial opportunities looming in France, he decided to relocate to Paris.

His cassettes had been odd, hi-tech, low-fi affairs, full of idiosyncratically applied synthesizers and drum machines. It was therefore not surprising that his major label debut, *Kutche* (1987, with Safy Boutella, released on Stern's African in the UK) was a hi-tech, hi-fi affair, and a wholly original and exhilarating mixture of traditional Arabic music

and instruments with state-of-the-art Western technology, including the Linn 9000 and the Fairlight CMI sampler.

Khaled: "My cassettes were very much home-made, DIY affairs, produced by Algerian producers. My work with Boutella was the first time I worked with a foreign producer. It was my first venture into true professionalism." Boutella was trained as a jazz musician at a music college in Boston, and this oddest of culture clashes created something so unique that, according to Khaled's A&R man, Barclay's Pierre Paparemborde, *Kutche* has become one of the most popular CDs to lift samples off for many Western dance and rap

music acts. However, *Kutche* gained little recognition with a larger audience, and Khaled decided to sign with the French label Barclay. Indicating that he felt he'd grown up, he dropped the 'Cheb' from his name, and set his sights as high as he could. Having acquired a taste for working with Western producers, nothing short of the world's top producers would now do.

CHEMISTRY

The first step was the album Khaled (1992), half of which was produced by Michael Brook, a producer with an excellent reputation for top world music albums with artists such as Youssou N'Dour and Nusrat Fateh Ali Kahn. With the exception of the scorching flamenco-influenced track 'Wahrane Wahrane', and the lascivious 'Liah Liah', which gave musical form to Khaled's reputation as "a man constantly on heat", Brook's production was little more than competent. The real breakthrough happened with the five tracks produced by Don Was, the American producer extraordinaire famous for his work with Bob Dylan, The Rolling Stones, Bonnie Raitt, Stevie Nicks, and his own bands Was (Not Was), and most recently Orquestra Was. Amongst these five tracks is the stunning and bizarre 'Didi', which was a hit in 49 countries and sold over a million copies worldwide. Khaled takes the story from the beginning: "I said to Barclay that I wanted to work with a top American producer, so they gave me a list. When I saw Don Was's name I wanted him, because I remembered the music of Was (Not Was), and he'd worked with Bob Dylan, who I also like a lot. Dylan is a romantic and poet who sings about love. So I went to see Don in Los Angeles, brought him the demos that I'd done with my keyboard player Mustapha Kada in my home studio, and played them for him. The demos were very good, better than Kutche, and Don said to me: 'What do you want me to do? These demos are excellent, I have nothing to add.' I said: 'No, no, no, I want you to create a different, more American sound, and I want you to play bass on it, because you're a great bass player.' So he said: 'Alright then, but it's going to cost you.'" [laughs uproariously].

Via transatlantic telephone from his home in LA, Was gives his version of their first meeting, and some other reflections: "First of all, I'd like to say that I've been a fan of Khaled for a long time. I'd bought some of his cassettes when Was (Not Was) was touring Europe in '86-87, and it immediately struck me that he was a very soulful singer, who could really penetrate your emotional skin. I also thought that he'd come up with a really bizarre way of working with drum machines and synthesizers, and combining them with traditional percussion and all this quarter-tone stuff. It was something I'd never heard before, and it was radical and extreme. He'd managed to use all this technology without losing any of the original identity of the music. So when I was approached to produce him, I was thrilled to even meet the guy. But what I liked about his stuff was that it was different, and when he asked me to incorporate American R&B — to Americanise the music — I must say that that was the least appealing thing about it for me [laughs]. But in the end I thought: 'OK, let's do it, and at least try to create some music that no-one has ever heard before.' I felt that there were a couple of really important political points that we could make, by attempting to make an irresistible record that everybody in Europe was going to want to play and dance to, and that was sung in Arabic. At the time, playing a record sung in Arabic on French radio was still almost a criminal offence. And secondly, I'm an American Jew, and I work a lot with American black



Producer extraordinaire and Khaled fan, Don Was.

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musicians. The nature of world history is that Jews, blacks and Arabs have been pitted against each other as a decoy, so that the powers that be can make money, and I thought that it was a really strong statement to show that when you put these three groups together, they can conquer anything."

Despite the fact that Don Was, like Khaled, was also aiming to conquer the world with the music the partnership would make, the success of 'Didi' still caught him by surprise. One of the keys to its success was the way in which Was put together the disparate ingredients that went into the

record. One such ingredient was music technology, and one of the big decisions. Don Was had to make was how to work with it, since it had formed an essential part of Khaled's Algerian DIY cassettes, *Kutche*, and also of the demos he'd made for the music Was was working on. Khaled: "There were many machines playing on *Kutche*, and although it was a very good album, when I went to the USA Don told me that I should have more live musicians, and that one shouldn't become the slave of the machines.

We nevertheless used drum loops made on a computer as the foundation

for the tracks Don and I made. I overdubbed drums played from a keyboard, and Mohsein [Chentouf, Khaled's percussionist] played live percussion." Was adds: "Synths and drum machines were the foundation of Khaled's music when he came to me, so it was important to use technology in the right way, and not suddenly go for a completely live sound. I think the combination of live playing and technology is the most interesting, unless you go for the emotional tension of completely mechanised playing, like Kraftwerk. Their coldness is a very strong emotional statement. I can't quite remember exactly what I did with

Khaled, but I have a Linn 9000, on which I program most of my drums, and we used a Macintosh, just sampled a bunch of shit, usually from my own programming and records, and looped it up.

"Using loops is very much a matter of working till you find something new that's made of something old. It's not so much the idea of taking someone else's drums that's appealing, it's more the texture that you get from re-generating your samples two or three times and losing overtones, and the hypnotic repetition that's evocative. And that works well with live playing. So I got this band together, a lot of guys from Was (Not Was), and together with Khaled, his keyboard player Kada and his percussion player Mohsein Chentouf, we set up in this tiny little MIDI room, which also had one overdub room. I was sitting behind the console playing bass, Khaled was out in the live room singing, his percussionist in the corner, and so on. It was really informal, with people listening to each other and to the loops, and for some inexplicable reason everyone locked. There was no reason to believe that there would be any chemistry there, but there was not only a great vibe, we set each other off, and worked really quickly. It was pretty wild music. I felt really great about it, and felt we'd managed to create something that had never been heard before, and that becomes increasingly hard to do these days." More than a million people worldwide agreed, though oddly the British and Americans are virtually the only people who are still largely unaware of this new sound.

BREAKING NEW GROUND

Just one year later, in 1993, the next album, *N'ssi N'ssi*, arrived. Don Was produced four tracks, French producer Laurent Gueneau and British producer Richard Evans produced a track each, and French composer, arranger and producer Philippe Eidel (see box below), produced and arranged the



1993's N'ssi N'ssi.

PHILIPPE EIDEL

Philippe Eidel is a guitarist, keyboardist, composer, arranger and producer who has built up a reputation in France and beyond for his work in the field of world music. Eidel was born on Madagascar, of French parents, and raised in Marseille, which probably accounts for his interest in world, and especially Mediterranean, music. He shot to fame with his record Balkan (1989), which featured Bulgarian voices and received a nomination for a Grammy Award. He also produced The Mahabharata (1990), for Peter Brook's film of the same name, a recording of which was released on Real World Records. Eidel's two most recent releases under his own name are the delightful Mammas, featuring four Mediterranean and music written by

him in a traditional style; and the stirring *Imuhar*, which, again, features music based around a film, and written by him in a traditional style together with people from Niger, a country located in the South Sahara. Eidel has also written the music for several other French feature films.

He works in his home studio,
Zombie, in central Paris, with a setup
based around a Yamaha 02R desk and
a Macintosh Quadra 950 computer,
with Logic Audio software (which he
also uses for score printouts), and
Digidesign's Pro Tools. "I'm finished
with tape recorders," he remarks. "I
stopped working with my Fostex B16
two years ago. Hard disk gives me
everything I want. With 12 tracks I
have enough to make something
happen, to be able to work on the
format of a song and quickly try new
things. I can experiment very easily

with hard disk, cut and copy things and so on. I have no problems with digital sound quality. Analogue is only good when you maintain your equipment very well, every day, so I prefer digital for that reason as well. My aim with my home studio is to have equipment that's good enough to enable me to take what I do here to commercial studios, without having to re-record it. So I always travel with my hard disk. I'm not that interested in having good reverbs or good effects. I'm not an engineer who can get great sounds. I'm just interested in getting things down on tape properly, and so I have a very good mic preamp with EQ and compressor, the JPL, a French valve

Interestingly, given the acoustic nature of much of Eidel's current work, he started out as a great fan of Brian Eno and Krafwerk, and developed a keen interest in synthesizers during the early '80s. "I like the idea of 'what you compose is what you live', like Eno's Music For Airports, and Kraftwerk's urban, industrial music, which was written in an urban, industrial context. So I still have and use an old Oberheim. the yellow one with the four modules, a Roland JP8, Minimoog, and so on. I also have a Fender Rhodes, Roland U220, Emu Vintage Keys, Roland MKS80 and Akai S3000XL sampler. I make my own percussion loops with the Akai, but I lack the patience for real drum programming. I'm not too much into sampling and programming anyway. When I work with world music, I try to respect what people do and work in their style. I'm not into the way Deep Forest work, sampling some bits and pieces and making world music with that. What is exciting for me is when things happen between people."

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ideas, and for this album he kept telling me: 'Philippe, go as far as you can go. Make things happen as much as you can, and I'll follow you.' Just as you have certain types of blues or folk songs, much of Khaled's music is based on traditional Arabic songs; these songs were very important to him, and he wanted to create very strong and definitive versions."

When writing new material, or playing around with traditional Arab material, Khaled usually works with Mustapha Kada in his home studio, where he has a "little mixing desk with 16 channels, a small tape recorder, a Yamaha drum machine, and two synths, one with Arabic quarter-tone tuning." Since Khaled professes to be completely non-technical, and always uses engineers and/or producers to work the technology, he couldn't remember more details. In this studio Khaled and Kada create demo tapes that are then re-worked by the foreign producers the singer chooses to work with, but in the case of Sahra, Eidel and Khaled worked together to create or rearrange material from scratch. Eidel elaborates on how he works with the singers for whom he writes and arranges music: "I wrote the music for the title song, 'Sahra', though Khaled changed the melody a little bit, as usual. He's very good at taking a basic melody and making it more melodic and making interesting changes, because he's such a good singer. The same happened with my Mammas and Imuhar projects (see 'Philippe Eidel' box), when I wrote music for traditional singers. I always leave some space for singers to change things. It's not like with pop music, where you have an exact melody in which you don't change a note. The other thing with singers is that I don't like doing composite vocals very much. It's boring, the vocal sound changes and it's a waste of time. Khaled hates doing more than three or four takes anyway. When you have a good singer it's much better to choose a good moment, and to give him or her good energy and confidence, so that you know he or she will be in good form and will only have to sing two or three takes. And even if there may be a phrase or word better in another take, I prefer to just leave it, because this is music, this is the way the song is, and it's OK."

For the Don Was tracks, Khaled and Kada had delivered him demos made in the singer's home studio on DAT, but sadly, because of logistical problems, Khaled couldn't make it to LA, so Kada travelled there alone, to help Was with the cutting of the three tracks that he was given to work with. Was: "Kada was Khaled's ambassador here. They had put Khaled's vocals on one track and the backing on another track, so I lived with the songs for a while, and changed the chords and structure around and made some new drum loops for them. I do that on the Linn 9000, and generally don't bother sync'ing it to tape. It's just a pain in the neck. I prefer to just play straight from the machine to tape. Then I took what I did to Ocean Way Studios, where I'd assembled a whole band. Percussion player Lenny Castro played to the rhythms, and everyone else played to Lenny and Khaled's voice. We recorded everything on 24-track analogue, and in the end I made a submix on DA88, sent a cassette to Khaled, he overdubbed his voice to it in Paris, and we then flew the DA88 tape back and mixed the whole thing in LA. So there was a sense of interaction, but it was also a bit of virtual reality experiment. We talked on the phone a lot about the direction we were taking, but it is true that Khaled has this spirit, and when he's in the room things light up. It's possible that we missed some spark from that. But then this new album isn't about adventure, it's his pop record, and for someone like

Philippe Eidel:

"I don't like doing composite vocals. It's a waste of time. Khaled hates doing more than three or four takes anyway."

him, a rai singer from Algeria, making a pop record is as wild as Ornette Coleman doing his atonal things. And yet I think there is still a lot of musical ground to cover for Khaled, and I hope to do some of that with him in the future."

Meanwhile, the object of all this interest and admiration was still lighting up the room at the Mango Records offices in London. Echoing Don Was's point about the political implications of 'Didi', and his observation that Khaled has similar leadership qualities and a similar role to perform for his people as Bob Marley, the singer argued that the integration of the enormous diversity of styles that can be found on Sahra is a political statement. The choice to give the album a slightly more commercial flavour just serves to further the message: "With my music I show that there is no racism in music. You can make music with a black or a brown or a white person, it doesn't matter. Jean-Jacques Goldman is a Jew, and by making a hit record together, we have demonstrated that Arabs and Jews can work together and do beautiful things together, rather than make war. The people who have protested against me doing this are living in Cro-Magnon time! I had a number one hit in Israel with 'Didi'. That breaks many barriers. It shows that music is from all places and all times and all people. The Arabic world, especially Arabic youth, has now declared me an ambassador for them, but I don't feel an ambassador. I feel more like someone who gives the Algerians, who can be found a little bit everywhere, pride. They have pride because I show the Algerian culture to the world. There has been no Arab music that has touched the world like rai music has. When they see that someone has travelled as far as I have, they have pride in that they have a king who has done something, who has given the world a beautiful image of Arabia." (0)





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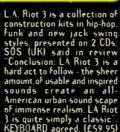
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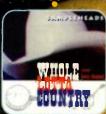
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Multi **MULTI-EFFECTS EXPLAINED**

PART 4: PAUL WHITE looks at how MIDI can be used to turn static effects into dynamic ones.

ast month, I examined the ways in which the various effects blocks found in a modern multi-effects processor can be connected to produce different results. and I also touched upon the idea of effects being modulated by envelopes or LFOs (Low Frequency Oscillators). This month I'd like to expand further on the modulation theme, and see what sort of effects can be achieved using MIDI control.

There's a tendency to think of effects as being pretty static - you plug them in, and straight away you have delay, chorus or reverb that you can add to your sounds. However, modern devices offer much more scope: the modulation and/or

Lexicon's MPX1 offers considerable scope for MIDI-controllable

MIDI control facilities built into some of the more sophisticated units enable effects to be altered in real time, either under the control of MIDI or an LFO, or in response to the dynamics of the input signal. In many ways, there's a close analogy between how this type of modulation works and how analogue synths produce their sounds, so if you have some experience in synth programming, effects boxes should hold few mysteries.

Just as a synth can have its filter opened or closed according to an envelope, a digital effects unit might be able to produce a chorus effect that slows down as the input signal level decays, or perhaps the chorus might also get deeper as it gets slower. A lot depends on the number of modulation sources and destinations a machine provides, and how many may be used at one time, but even with a little imagination and a fairly basic effects unit, it's quite possible to produce morphing-style effects, where you hear one type of effect when the input is loud, and this then changes into a quite different effect as the input level decays. Such effects are probably best suited to use with instruments such as guitars or other natural sounds — with synths, we're so used to hearing impossible things that even an effect of world-shattering proportions could go completely unnoticed! However, effects units are now starting to include resonant filters as standard, and by linking these to a MIDI triggered envelope, or by making them track the input signal's envelope, you can add synth-like filter sweeps to instruments that have no filters of their own.

It may also be possible to use an external volume pedal to control some effects parameters in real time, and though the most obvious things to control are wah-wah and volume effects, you can produce some fairly sophisticated results by making the pedal change several parameters at once. There is an important point to make about modulation, though: it's not usually desirable to

"Just because a parameter can be varied in real time, this doesn't mean that it will sound OK."

make a parameter shift over its complete range in response to your control stimulus. More often than not, you'll want to be able to set upper and lower limits between which the parameter will change in response to the full travel of a pedal, or to the sweep of an input-tracking envelope follower. Fortunately, any effects unit with worthwhile modulation facilities will include a facility to let you define your own limits.

The majority of effects units, other than the very cheapest models, come with some form of MIDI control, but you'll have to check your manual to see exactly what that allows you to do. At the very least, you should be able to change patches or mute the effects output via MIDI, but you can usually do a lot more. Some effects units will have a full set of MIDI in, Out and Thru connectors, whereas others may have a combined Out and Thru. Most machines will let you do a SysEx (System Exclusive) dump of individual or global patch data, and this is easily saved on a sequencer, so it's a good idea to back up any of your own



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MULTI-EFFECTS EXPLAINED



Another modern effects unit that allows MIDI control of most of its parameters — Digitech's Studio Quad V2.

▶ patches in this way, just in case the unit fails or the internal memory battery dies on you. You can also transfer patches directly to another effects unit of the same type via SysEx, providing both machines are set to the same SysEx ID number.

Another common feature is the patch map or allocation table, which allows you to decide which patches will be called up by which MIDI Program Changes, rather than patch 1 always being tied to Program 1 and so on. The idea behind this is that for live use you can team your effects unit with a MIDI keyboard, then create a table so that whenever you call up a new patch on the synth, an appropriate effects patch is loaded to complement it. If you're working from a sequencer this isn't so important, as you can specify effects patches in the same way as you set up synth patches. I have to say that I've never yet had the need to set up a Program Map, but at least you know it's there now!

Things start to get more interesting when you begin to control effects parameters themselves over MIDI. Depending on the effects unit you're using, this may be done using SysEx or MIDI controllers, the latter being by far the easiest to manage, as you can set up a page of controller faders in your sequencer, or use a keyboard controller such as a joystick or wheel. The number of controllable parameters available depends entirely on how the effects unit is designed — some budget units may give you only a couple of MIDI-variable parameters per patch, whereas some of the more sophisticated boxes let you access virtually any user-adjustable parameter over MIDI. Whether MIDI control of all of these makes

machines you have to go into a MIDI setup page and switch on SysEx transmission.

Because SysEx messages can get quite complicated, there's a limit to how many parameters you can control at the same time before the data stream gets clogged up, in which case the result will become pretty jerky. Two or three simultaneous changes is probably as good as it gets using SysEx, whereas MIDI Controllers are less greedy. However, you may be able to map several parameters to change in response to a single controller, and that doesn't take any more MIDI data.

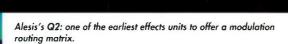
When using controller data, it can sometimes be tedious to map the required controller to the parameter you want to change. Some units have a so-called MIDI learn mode, which makes this job a lot simpler. All you do is choose the parameter you want to change, then move the physical controller you want to use to control it, and the effects device will recognise the controller and assign it for you. The exact procedure varies from machine to machine, but it doesn't get much more complicated than that.

Because MIDI controllers can leave your parameters set to non-standard values, most sensibly designed effects units respond to the MIDI command 'Reset all Controllers', enabling you to set any patch to neutral after having made changes to it via MIDI. Parameters will also be reset when you change to a new patch.

In addition to using MIDI to make continuous parameter changes, you may also find that you can use MIDI Clock to synchronise time-related functions such as LFOs, delay times, and so on. This is a very useful feature to have, as you can create stock effects that will always work in time with a track, no matter what the tempo is. It also means that you can include tempo changes in your songs and the effects will stay in sync. Typical sync effects would include tremolo, vibrato, panning and delays.

MAKING CHANGES

If you've ever tried to switch to a new effects patch during a mix, you'll almost certainly have noticed that most units don't switch patches very smoothly, but leave you with a rather clumsy gap at the changeover point. If you have a suitable gap in the track, that's the best place to change patches, but in some instances it's possible to use MIDI parameter changes to make the current effect change into a suitable new effect without having to switch patches, and without glitching. For example, if your effects unit lets you create patches using two parallel effects blocks, you could use MIDI to control the level of each block. To create a change from delay to chorus, you'd set up chorus in one block and delay in the other, then use MIDI to turn down one block at the same time as turning up the



sense is another matter, but at least you won't find your way barred by a limited operating system!

If your machine uses only SysEx to control effects parameters, don't panic, because there's a fair chance that if you can adjust the desired parameter using a data wheel on the front of the unit, you'll also get real-time SysEx transmission via the MIDI Out socket at the same time. In other words, you make the changes on the effects unit front panel and record the changes directly to your sequencer via MIDI. Note that with most

other. This could be done quickly or as a smooth crossfade. You may also find it useful to use the MIDI master volume facility in your effects unit to automate effects level from your sequencer.

SUMMARY

The concept of using modulators or real-time MIDI control to add dynamic automation to effects is reasonably straightforward, but to get the most out of some of the more sophisticated effects boxes, you'll have to spend as long learning to use them properly as you would a synth. When creating a brand-new effect, it helps to draw it out in block diagram form on paper, then see if you can create a routing within your effects processor that will let you do the same thing. You may also have to verify that your unit can run all the blocks you need at the same time, because a great many devices use shared processing resources to generate the individual effects. If you happen to use a couple of processor-intensive effects in your patch, there may not be enough processing capacity left to help you achieve your aim. Sometimes you can compromise by using a less elaborate reverb, or if you need delay and pitch-shift at the same time, you may find there's enough delay available within the pitch-shifting algorithm to do the job without you

ZIPPER NOISE

Just because a parameter can be varied in real time, this doesn't mean that it will sound OK.

There's a phenomenon known as 'zipper noise' that occurs to a greater or lesser extent in all digital systems where real-time parameter change is involved, and it comes about because, unlike analogue equipment, digital devices can't produce perfectly smooth changes — everything happens in a series of small steps. If the steps are small enough, the change sounds smooth enough to fool the ear, but if the steps are large, you can hear them change with a kind of rasping or ticking sound

— hence the term zipper noise. To change some parameters requires the processor to calculate a lot of data in order to work out what to do, so you may find that trying to change chorus depth very rapidly produces audible and unpleasant side effects. This is because the time needed for calculation means the steps can't be as close together as perhaps we'd like them to be. Usually the processor's manual will warn you which parameters are most susceptible to side-effects, and you may also find that there's a lot of difference between different models of machine due to the different algorithms used, and whether or not they include something called interpolation, to smooth out the steps.

having to use a separate delay block at all.

If you're going to get into effects programming in a big way (or synth programming, for that matter). I'd recommend you consider using a computer editing system if one is available for your machine. Even if you can't get a dedicated editor (or universal editor module) for your specific effects unit, you might find that you can go part of the way by creating a MIDI controller map in your sequencer to provide access to the main parameters. All you need to do is create one patch with the desired MIDI controller assignments, then use that patch as your starting point when making edits. Some tasks, such as assigning effects blocks and changing routing, may still have to be done from the front panel, but you should still be able to use controllers to fine-tune the effects.

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the effect effect ART EFFECTS NETWORK

£300 is becoming a crowded price point for well-specified effects units, but ART nevertheless hope to stand out with their new Effects Network. MARTIN WALKER decides whether it has what it takes to muscle in on the competition.

Pros & cons

ART EFFECTS
NETWORK £299

Pros

• Excellent reverb sounds for the price.
• Low-noise operation.
• No wall wart.

Cons
• Overloads fairly easily.
• No global override setting for mix levels.

Summary

A good all-rounder with a clean, natural sound at a bargain price.

bet most of us have been guilty of tying up a multi-effects unit solely for reverb use - I know I have! ART have decided that enough is enough: if you want reverb, why not devote the whole of the processor power to this single effect? And if you want delay or effects, why not divert that same processor power to those? The result is the Effects Network, a low-cost unit that, according to its manual, is "a combination of powerful processing and ease of use". Most of its algorithms are single effects that fall into one of three groups: reverbs (eight algorithms), delays (six algorithms), and effects (17 algorithms, including chorus, flanging and other pitch-related effects, plus a dozen or so 2-part combination effects). It features stereo inputs and outputs, 100 editable presets and better than 86dB dynamic range — and all for £299. Is your mouth watering? Let's enter the virtual world of sonic manipulation...

ON TONIGHT'S PANEL

First impressions are always important, and the Network has a nicely understated front-panel

design that makes it look expensive. No go-faster stripes here, just a tasteful, uncluttered layout in black and grey — a model of clarity and restraint. It comes in an all-steel 1U case and, to save you nipping to the 'Cons' box at the end of this review, no, it doesn't have a wall wart; the power supply is built in. From left to right on the front panel, tnere's a push-button power switch (another good point if you don't switch on all your rack equipment globally), and then the main LCD display area. The text information appears in a 16-character x 2-line window, which is a fairly standard display device used in many other units. To the right of this are the signal and clip LEDs, and then a large 2-digit display showing the preset number. The free-wheeling rotary encoder is the main editing tool, along with two buttons labelled Param and Value, each with an associated LED. One click on the Param button illuminates its LED, and changes the main LCD display from the preset name to a single parameter (such as mix level or delay time). The rotary wheel now scrolls through all the parameters available for that preset. Once you find the one that needs tweaking, you press the Value button (lighting up its LED); now the wheel alters the value of the parameter.

The next batch of buttons is just as easy to use. The top row of three (reverb, delay, and effects) all have associated LEDs, and whenever you scroll through the presets, the appropriate LED lights up to show which class of effect is



being used. This saves a lot of time when you're searching for a suitable effect in a particular category. If you want to create a new preset from scratch, pressing the appropriate button from these three starts the LED flashing, and the LCD window now displays 'Pick a type' so that you can scroll through the available algorithms in that category. Once you find the one you want, press either the Param or the Value button

"The Effects
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studios."

to select it, and you can carry on editing the individual parameters in the normal way.

Beneath these buttons are two more. The first press of Save allows you to edit the preset name (using the wheel to select letters and numbers and Param to move along the name), and a second press stores your new preset. The final button, Bypass, has a red LED next to it that flashes when the unit is in Bypass mode. Finally, on the right-hand end of the front panel, there are input and output level controls. Round the back, all inputs and outputs are on quarter-inch jacks — left and

right inputs, left and right outputs, and a socket for a footswitch, which can provide control of bypass, Repeat Hold, and tapped Time. The final two sockets are MIDI In and a combined MIDI Out and Thru.

AND NOW FOR A DEMONSTRATION

I did initially find level-setting a bit tricky on the Effects Network when I wired it up. The Clip indicator seems to be analogue rather than digital: it doesn't suddenly switch on brightly beyond a preset level, but slowly increases in brightness. However, the Effects Network seems sensitive to overload, and the slightest dim glimmer of clip LED was accompanied by a nasty edge to the sound. The manual recommends setting levels so that the signal LED is on most of the time and the clip LED flashes briefly on transients, but I found it safer to make sure that clip never came on at all. Also, although simplicity is the Effects Network's middle name, it would have been useful to have markings around the level control knobs to return to previous settings more easily.

Normal operation is simplicity itself—twirl the wheel about until you find a suitable preset, and if you need to do any editing, press Param, scroll until you find the appropriate parameter, then press Value and alter it with the wheel. All the buttons have a positive click action, and after a few seconds the editing technique becomes second nature. This part of the design has achieved its objectives—it's very intuitive and easy to use, and removes the need to constantly press cursor left and right keys to reach a particular parameter from several on a larger screen.

As to the sounds — well, I normally go straight to the reverbs when sounding out a new effects unit, and there's nothing to disappoint here. Lush, warm and natural were the words that immediately sprang to



ART Effects Network

mind. Although there are only a few parameters available for tweaking (in the Hall algorithm, apart from mix level there are just decay time, pre-delay time, EQ and damping), the single EQ control does more than you might expect. From its central Thru position, it acts as a variable LPF to the left (attenuating high frequencies above the cutoff point with a fixed rolloff), and a variable HPF to the right (attenuating low frequencies below its cutoff point with a fixed rolloff). This allows you to create a wide range of EQ effects which wouldn't be easily duplicated with a typical mixer's EQ.

The reverb algorithms available are Room, Hall, Plate, Chamber, Gated, Reverse, Dual Room and Dual Plate, the last two being two separate mono effects in parallel. There are between four and six parameters per algorithm, which allow most basic settings to be altered, but no exotic options such as the Density, Diffusion, and Swirl adjustments allowed on some competitors' models. This is not, therefore, an ideal unit for wild excesses, but is more useful for natural-sounding treatments. I'm sure that many people would also agree that, on some budget effects units, the basic sounds often need a lot of frills to disguise the underlying algorithm sounds. Those from ART need no camouflage — they sound great just as they are. They also pass the big test for a reverb: turn the effect level right up, and if the sound just floats further away, it's a good 'un. (If it becomes chorus (two-stage or four-stage) is rich and full; the flange offers normal or inverted settings for that full cancellation effect; the pitch-shifting is good for the price point... What more can I say? Each combination effect uses only part of the processor power, so these effects don't come up to the same standard as the dedicated effects, but the extra versatility of the combined sound could be just what you need at the time. Unlike the reverbs, both the delay and effects sections give you up to a dozen parameters to control.

There are 100 presets, which run from 1 through 99 to 00. Unfortunately, the numbers don't wrap round, but you can still get from one

"Normal operation is simplicity itself."

end to the other in two big twists of the wheel. The factory sounds can be restored either singly or globally. All of them are eminently usable, and adjusting them for a particular application requires a quick tweak, rather than major surgery. The MIDI side is fairly standard, although you can control up to four parameters from MIDI controllers in a single preset for real-time adjustments. Program changes are made via a MIDI program table, and SysEx dumps are catered for in both directions, to load and save presets.

CONCLUSIONS

This unit gave me several surprises. When I first opened the packaging, I thought it looked like a £400-500 device. Once I'd connected it up and had a twiddle of the knobs. I realised, from the limited number of parameters, that this was a budget unit. However, once I'd spent some time actually auditioning the sounds, I was impressed especially at this price. The ART Effects Network has very natural sound algorithms, and could quite easily become a workhorse in small or large studios. The reverbs are very usable, particularly if you use a lot of acoustic sources rather than electronic ones. The Network might not be quite as versatile as some other units, but ART specifically intended it to do a single job well, and it has achieved that aim nicely. If you want a good-sounding effects unit that will be mainly used for a single treatment, rather than a sound-mangling chain of them, this could be just the job. 505

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COMPETITION TIME

If you compare the Effects Network with a couple of similarly priced models, one of its closest competitors is probably the Alesis Midiverb 4, which has a similar range of algorithms. As I had one of these to hand, I tried some side-by-side comparisons. I must admit that I initially found the Midiverb 4 more 'impressive' in an obvious sort of way, especially with up to a dozen reverb parameters, as opposed to the Effects Network's four, and the Alesis custom LCD, which features built-in level meters. However, just listening to the sounds and ignoring the boxes, I noticed some subtle metallic colorations at the end of the longer Midiverb decays. By comparison, I feel that the ART unit gives a warmer and more natural

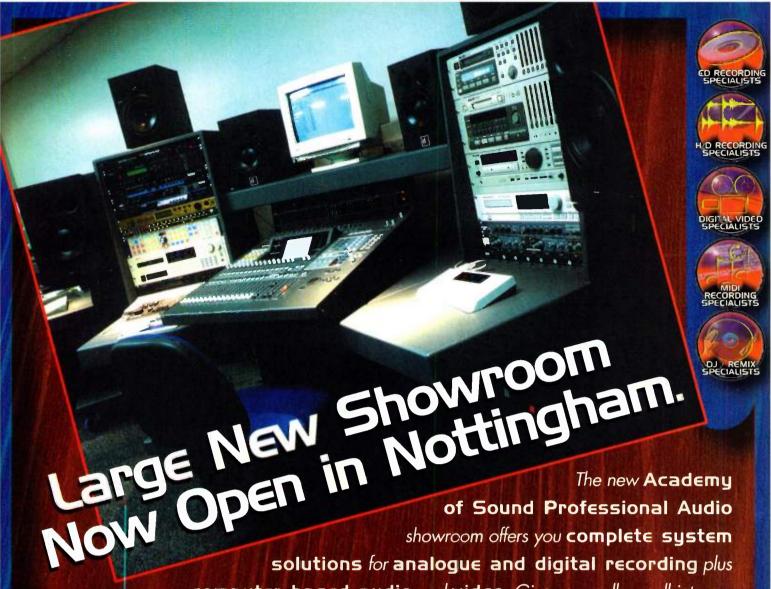
sound, with the result that you can hear 'further' into the room. Both units have similarly low noise levels at typical working settings.

Lexicon have always been renowned for their algorithms, and their Alex is also about the same price on the street, but has a very spartan approach compared with both the ART and the Alesis. Again, I think that the Effects Network's algorithms compare very favourably; the ART also seems rather quieter noise-wise than the Alex.

Of the three, the Effects Network and Alex both seem ideal for basic natural sounds, with the Network winning on lower noise levels; the Midiverb 4 gives a wider range of sounds, and its noise levels are nearly as low as the Effects Network's, but again the ART has the edge on basic reverb sounds.

muddy and cluttered, it's back to the drawing board.)

Delays have always been one of ART's strengths. There's a good range here — Mono, Dual, Offset (an initial delay, followed at each repeat by a separate left- or right-delayed repeat), Mono Tapped, Dual Tapped, and Multi-Tap SPFX (which let the taps speed up or slow down, for more dramatic effects). Up to 22 taps are available for all but the Dual Tapped type, which can have a maximum of nine for each channel. The third category of effects includes stereo treatments for Chorus, Flange, Pitch-shift, Tremolo, and Panner. There's also a further selection of a dozen combinations, such as Flange plus Reverb and Chorus plus Delay, which sum the L and R inputs before sending them through the two effects in series, after which they emerge in stereo. The



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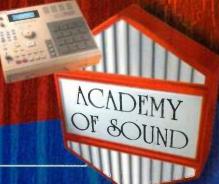
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serious

With their new 606 delay, Symetrix have attempted to combine today's technology with the user interface of yesteryear. PAUL WHITE finds out how well they've succeeded.



SYMETRIX 606 DUAL-CHANNEL DELAY



o matter how sophisticated effects units become, it seems that everyone still has a soft spot for the old manually adjustable digital delay boxes with no program memories and lots of control knobs. A user interface makes a world of difference to how well you can operate a machine, so it made perfect sense when Symetrix announced their intention to build a programmable delay machine with a knobdriven interface that would deliver pristine sound quality and include a few added features to bring it up to date. Indeed, the two-channel 606 is far more than just a delay effect — it can also produce the full range of modulated delay effects, from delay and slapback to chorus, flanging and phasing, both in dual mono and stereo mode. This isn't so unusual, but the designers have also added variable Q, multi-mode filtering, room simulation, delay diffusion and a few other twists.

Despite this extra sophistication, the user interface remains relatively straightforward, thanks to the 10 rotary knob encoders used to select and change the effect parameters (although, as we shall see later, the interface isn't perfect).

A conventional volume pot sets the input level, and each channel has its own 4-stage input metering, though a few practical tests indicated that the meters aren't equipped to warn of internal overload caused by setting ludicrous feedback values. I know this because I am the man who set those ludicrous feedback values, and the result sounded like a tortoise in a blender with a little top boost added! Most of the parameters, the titles of which are printed above and below the knobs, have familiar names, but there are a couple of less obvious ones that I'll explain when I get to them.

THE PACKAGE

The 606 is powered directly from the mains and is packaged in a tough, dark blue rack case. Both the inputs and outputs are on balanced jacks rather than XLRs, which makes connection to a patchbay easier,

and there are also MIDI in and Out/Thru connectors as well as a footswitch jack for accessing a tap tempo facility. SysEx patch dumps are catered for, both bulk and single. Each channel also includes a LED that flashes at the rate of the currently set delay time.

Unusually, the 606 still relies on a basic 3-digit, 7-sector LED indicator window for displaying patch numbers and therefore resorts to displaying either cryptic abbreviations or straight numbers for the parameter names when editing. Turning any knob by one detent click will cause the display to show the current parameter without changing it — subsequent clicks then increase or decrease the displayed value. A similar system is used for the Preset knob — one click brings up the current preset, then you can dial in any preset of your choice. Once the preset has been changed, the display flashes until you load in a preset with (perhaps unsurprisingly) the Load button. Hitting Load twice bypasses the currently loaded preset.

Patches 1 to 99 are user memory locations, and patches 100 to 110 are filled by non-volatile factory building block 'template' programs (which can't be overwritten); these may be used as the basis for user patches. These factory patches are also copied into the first nine user memories. The rest are filled with examples of what the machine can do, though you can of course replace or alter these. If you press the Store button, the current effect will be stored in the location shown in the display window, providing it's a user patch location. There's a memory protect function in the global menu to prevent accidental erasure or modification of the user patches.

The 606 may be configured as two separate mono units, or the two channels can be coupled to work together to create stereo effects. This is determined using the Mode switch, though the coupled mode can only be selected if the current effect includes links between the two channels. For example, there may be a feedback path that crosses from one channel to the other.

Though there are 10 control knobs in the

pros & cons SYMETRIX 606 DELAY £599 pros • Excellent sound quality . Huge range of high-class delay, filter and early reflections effects. · Comprehensive modulation and editing · Separate knobs provide direct access to the most important effect parameters. . In-depth editing hampered by parameter numbering system • Display shows only patch numbers, not summary This is a wonderfully flexible, nice sounding effects unit that offers something a little out of the ordinary. Used at a fairly basic level, the front-panel knobs make

effect editing very easy, but in-depth editing is more complicated than it needs to be,

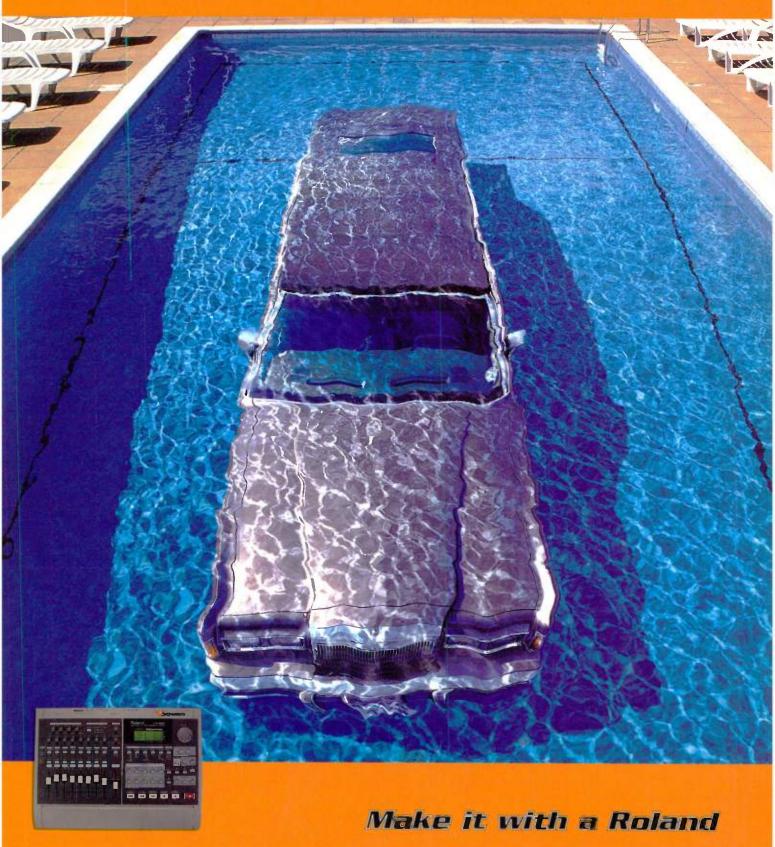
due to the lack of a multi-character display.

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Symetrix 606 dual-channel delay

programming section, there are rather more available parameters than this, so Symetrix have added a Select button that scrolls around three possible sets of editable parameters, printed above and below the knobs. The lower line accesses Mix, Time. Feedback and Modulation for the two delay lines, while the next row up addresses Filter Frequency, Filter Q, Diffusion Amount and MIDI Clock Sync, again for both delay lines. The top line of parameters gets you into Mod Select, Mode Source, Mod Destination, Mod Level, Oscillator Rate, Diffusion 1 Model, Diffusion 2 Model and Room Size (of which more in a moment). At the end of the row is the Parameter Select/Parameter Adjust/Output Level knob, and further sub-parameters may be called up by number (or occasionally by abbreviation) and then adjusted. For example, the filters offer eight different high-pass, band-pass and low-pass modes, and these are all denoted by a two- or three-letter abbreviation. The Select button is used to flip between parameter select and parameter adjust modes, and the operation is very simple, but it helps enormously to keep the included A3-size plastic sheet, which has the block diagram printed on it, close by, as this shows all the parameter numbers at a glance.

The basic rate/depth/shape modulation parameters should be familiar enough and are used to create chorus, flanging, vibrato, phasing and so on, but what are Diffusion and Room Size parameters doing in a delay box? The 606 has an early reflections mode that may be explored by loading the ERL preset. In this mode, the inputs are summed to mono, then fed into a virtual room, the dimensions of which may be changed. This is quite a complex

piece of processing and the various reflections are generated by ray tracing, rather like the graphics programs used to render complex 3D images. Various other parameters may also be adjusted, such as position within the room, the reflective properties of the walls, the distance from the source, and even the space between the listener's ears. The manual recommends that, for most effective results using the Room Simulator, the dry/wet balance should be set up in the 606 rather than using the 606 in the effects loop, as you might normally expect.

Diffusion is a separate block that comes directly after the filter block, but no specific description of this function is included in the manual. As far as I can tell from listening while tweaking, the intent is to create a natural 'smearing' effect by adding early reflection-type multiple delays to the main delay. The delay feedback may then be taken from the output of the Diffusion module, from the filter or from the delay's untreated output.

The Filter section is rather like that of a synth with various high-pass, low-pass, bandpass and notch options, as well as a Q control that can take the filter right into self-resonance. Each channel comprises an identical chain of identical processing blocks, apart from the room simulator — you only get one of those.

FLEXIBLE FRIEND

If you think the 606 sounds a bit more complex than a delay line with knobs on, you're probably right, but the idea of the design is that you can keep things simple if you want to, or move firmly into anorak-land by designing your own effects with complex modulation sources and MIDI control. To see just how comprehensive the system is, take a look at Figure 1, which shows a considerably simplified version of the block diagram on the printed plastic sheet that comes with the 606. The card also includes (on its other side) a list of the editable parameter numbers, along with a description of what each does.

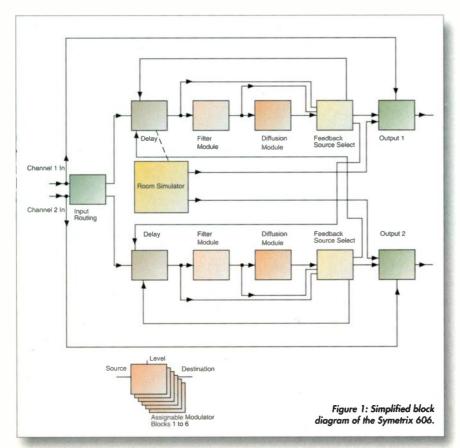
THE EFFECTS

The subjective quality of the effects is very clean; there's a maximum mono delay time of 2740ms and a stereo delay time of up to 1350ms. Conversion is 20-bit delta-sigma, producing a dynamic range in excess of 90dB, and with a frequency response of 20Hz to 20kHz within 1dB. With a maximum input level of +25dBu, there's also plenty of headroom.

A brief skip through the factory patches gives a good idea of what the 606 is all about. Because there is a filter section after the delay block, it is possible to emulate vintage tape echo units where the delays get progressively duller, and resonance can be added to create more synth-like sounds. A panning option also adds movement to stereo effects. The room simulator early reflections may be combined with the delay-based effects, and crossfeeding delays from one channel to the other allows interesting stereo effects to be set up. I was particularly impressed by the depth and transparency of the flanging and phasing effects, and bringing the filters into play means that some radical sonic transformations can be invoked.

MODULATION

In true analogue synth fashion, the 606 has a choice of six modulation sources which may be used to vary parameters in real time. These are arranged as six blocks where each has a user-selectable source, destination and level. In addition to the usual triangle and sawtooth LFOs, there are random mod sources, sources that track the input signal level and MIDI controllers, which allow the use of mod wheels, breath controllers and footswitches, as well as control over MIDI Volume and keyboard position. There are 18 possible modulation destinations with a total of eight MIDI controller options - virtually every relevant parameter within the 606 may be controlled via MIDI. Delay effects may be synchronised using the tap tempo function, and it is also possible to sync delays to MIDI Clock.





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Symetrix 606 dual-channel delay

I was also pleasantly surprised by the room simulator, which is very convincing in the early reflections department. It doesn't have the density or smoothness of decay of a top-end reverb unit, but for adding space and texture to sounds such as vocals, flutes and synths, it's excellent.

SUMMARY

Sonically, this is an excellent unit capable of some very nice delay-based effects indeed, and those wanting a super-quality, modern delay line with old-fashioned controls will find they can use it quite happily on that level. However, those prepared to delve a little deeper into its operating possibilities will be rewarded by a much broader spectrum of effects than you'd expect to get from a regular delay/modulator device. However, I do feel it's fair to say that the lack of a proper LCD display with full parameter names doesn't do the unit any favours when you get into serious editing. Indeed, if you don't have the manual or the plastic flowchart sheet, it's quite impossible to figure out what some of the parameters are, as they're only referred to by number. I suspect this

"...you can keep things simple if you want to, or you can move firmly into anorak-land, designing your own effects with complex modulation sources and MIDI control."

> decision was made to keep the price of the unit down, and I have to admit I was expecting the price to be rather higher than it turned out to be, but it still seems to fly in the face of the original ethos of returning to a simple control interface.

It's a little tricky to pigeon-hole the 606, because it's not a multi-effects unit in the traditional sense of the word. At the same time, it's much more than a simple delay box, and with such a comprehensive modulation system, room simulator and resonant filters, the more adventurous programmer should really have it jumping through hoops in no time. It's only when you play with a box like this that you realise how versatile delay-based effects can be, and when you take the excellent sound quality into consideration, the 606 is - despite its flawed user interface — excellent value. 505





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Band aid

NTI NIGHTPRO FQ3D DUAI-CHANNEL EQUALISER

High-quality equalisers have the magical property of allowing you to tweak tonal content, while themselves remaining practically invisible to the ear. HUGH ROBJOHNS checks out a contender from an American company new to the UK market.

he NTI Nightpro EQ3D is an equaliser — a dual-channel, 6-band equaliser. Those few words might appear dull enough to encourage you to turn the page in search of something with lots of flashing lights, pages of set-up menus or a MIDI port, but in this case, that would definitely be your loss!

The EQ3D is not just an ordinary equaliser; it offers something a little unusual in the way of equalisation: sheer musicality. This EQ manages something that few others achieve, intended to serve as a mastering equaliser, allowing gentle 'sound tailoring' to breathe some top-end life back into a tired mix, or give a gentle bloom and weight to the low end. What it won't do is cure a honking PA system, or notch out the hum from a guitar amp.

It has often been said that a really good equaliser cannot be heard. I'm not sure I completely support that point of view, but certainly it's possible to apply extraordinarily large amounts of EQ with the EQ3D before it becomes obvious. The inclusion of Nightpro's 'AirBand' high-frequency shelf section also produces far better results than cheap enhancers when it comes to putting the brilliance back into a recording.



The EQ3D is housed in a 1U rackmounting box which is a slim 195mm deep. The top and bottom panels can be removed (after releasing a multitude of screws) to provide access to the internal circuitry and a couple of configuration jumpers.

The rear panel is extremely simple: just a pair of male XLRs for the outputs, a pair of female XLRs for the inputs, and an IEC socket for the mains electricity. The EQ3D features a switched-mode power supply which can accommodate both 110V mains or the UK 240V rating.

The unit is shipped with the audio connections configured for unbalanced operation, but it's a simple matter to move a couple of jumpers inside to provide full electronic balancing of inputs and/or outputs, as necessary. The majority of my testing was carried out with the unit in balanced mode, but there was virtually no practical difference between the two formats in terms of audio performance.

Internal construction is to a very high standard, with components mounted on three circuit boards: one for each audio channel, and a third for the switched-mode power supply. Components are of good quality, and the active audio electronics appear to be made up entirely of the industry-standard NE5532 operational amplifiers. The supplied specifications claim an overall bandwidth of 5Hz-330kHz (-3dB points), a signal-to-noise ratio of 90dB, and total harmonic distortion of 0.005% — all of which is very respectable indeed.

The front panel is painted a very attractive electric blue colour, with silver labelling and graphics. A rocker-style power switch is placed at the extreme right-hand side, and there are two complete sets of colour-coded controls (one set for each channel), with independent bypass buttons in the centre of the unit. There's no provision for





accurate stereo linking between channels, and I would not recommend the EQ3D be used on stereo material. I found it hard to match settings between channels (especially with more extreme settings) and the inevitable result of this is blurring and instability in the stereo image.

SPINDLES WITH KNOBS ON

Each channel boasts five independent EQ bands (all offering up to 15dB of boost or cut), plus the AirBand, which is boost only. Each section has a low Q-factor (to minimise phase shifts — a key part of the sound quality of the EQ3D), resulting in a broad bandwidth of about 2.5 octaves. This wide bandwidth of each section, combined with their frequency spacing, ensures that they overlap each other nicely, and will interact smoothly to produce many different and musical tonal variations.

The leftmost control for each channel is the 'sub-band', which is centred on 10Hz and has a black knob. The adjacent bands (with blue, green, and red knobs respectively) are centred on 40Hz, 160Hz, and 650Hz, and these all have bell-shaped symmetrical responses. The next band is centred on 2.5kHz, with an orange control knob, and this has a high-frequency shelf response (ie. everything about the turnover point is lifted or reduced).

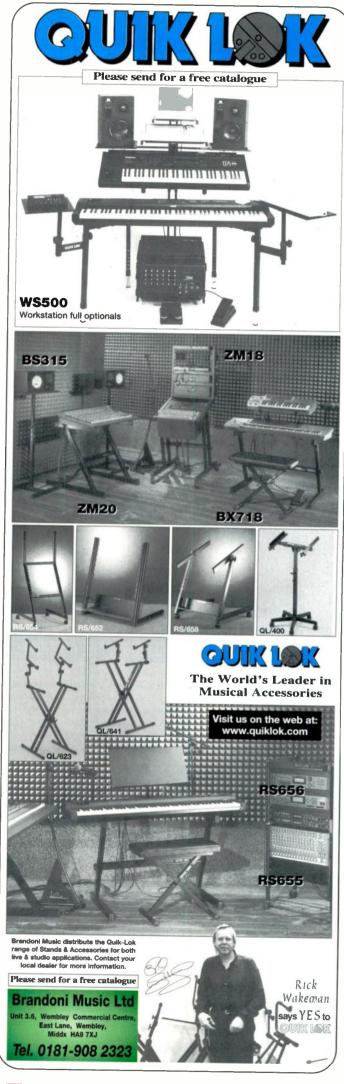
Unfortunately, none of these controls has a centre detent to define its unity gain position, although the scale around each knob is clearly marked from 5 to zero and back to 5 — zero being the unity gain position. However, the manual points out that because only very small amounts of boost or cut are normally needed, a centre detent on the knobs would be a hindrance rather than a help. After using the machine, I think I would agree with this philosophy.

Just to the right of the 2.5kHz control is a red peak overload LED which illuminates when the circuitry runs out of steam! In practice, you have to abuse the unit pretty severely to warrant illuminating it, and the EQ3D seemed to have more than enough headroom for realistic settings.

The last band is the AirBand, which also has a high-frequency shelf response. Its yellow boost control is marked 0 to 10 (although it still only provides a maximum of 15dB boost), and the adjacent blue switch determines the turnover frequency. This last switch control is called VariAir and has six positions, which offer turnover frequencies of 2.5, 5, 10, 20 and 40kHz (plus an off position).

PLACES TO PLAY

The EQ3D is a useful tool which brings benefits in a variety of applications. The most obvious one is in recording and tracking, where the unit can be patched between the microphone preamp (or inserted into the mixing desk's signal path) and the recorder. The manual also recommends using the EQ3D in mastering, broadcast, post-production, live sound and home listening systems. I have a few reservations with these last



NTI NIGHTPRO EQ3D Equaliser

applications — not because the unit wouldn't enhance the sound quality, because it almost certainly would have a beneficial effect — but because there is no stereo linking facility on the controls, as mentioned earlier.

I found the EQ3D worked best at the mastering stage, where I could tweak the overall sound character of a mix in a very subtle but surprisingly effective way. In cases where I would normally have plugged in a multi-band compressor to thicken a mix up a little, I found the EQ3D could be used to produce similar results, but with a more open and transparent, and a less artificial, feel.

Using the EQ3D during mixing is a rewarding experience too. With careful setting up, the box really does help to open up the sound, and seems to capture a lot more 'life' than is normally possible with run-of-the-mill microphones and preamps. With top-end mics processed through the best mic preamps, I didn't feel the need to use the EQ3D during recording or mixing, but with more modest equipment the EQ3D was a real help and probably added about 50% to the apparent cost of the front-end!

My favourite controls were those at the extremes of the frequency ranges — the 10Hz and the AirBand set to either 20kHz or 40kHz — but you need to be very careful, especially if you're recording onto DAT or a hard disk recorder (anything digital, in fact). The point to bear in mind when tweaking the frequency extremes is that you need to be able to hear what you are doing, and monitoring on limited bandwidth nearfield speakers can be very misleading.

Pulling up the bottom octave with the 10Hz

signals into the recorder. This breaks the Nyquist rule prohibiting audio above half the sampling rate, and the result is anharmonic distortion of the most unpleasant kind. I found an old first-generation Sony DTC 1000 machine suffered the most from this phenomena, but a Sony R500 was very good in an identical situation. Modern A/D converters use a form of oversampling technology and accurate digital filtering to produce much more efficient anti-alias filtering, and the R500 proved just how much better it is!

The moral is that you should be extremely cautious with the frequency extremes. Use only very modest amounts of boost at the low end, and if your monitors don't cover the full frequency range, err towards too little! Clues to look for are meter indications that seem too loud or don't appear to relate directly to the audible programme, and loudspeaker amplifiers that get surprisingly hot or run out of steam earlier than they should. As far as the top end is concerned, the same rules apply; monitoring through your digital recorder will reveal any aliasing problems:

The four middle frequency controls initially appear to be grouped at the bottom of the spectrum, but this is actually where the bulk of the audio energy lives and, in practice, the controls are very well chosen indeed. The range of subtle tonal variation that can be achieved is marvellous and always completely musical, apparently always working in harmony with the instruments. The bands work well together, and careful manipulation of adjacent bands makes an enormous range of control possible, allowing the desirable qualities and characteristics of most instruments to be drawn out.

SUMMING UP

This is without doubt a very useful tool which would inhabit the 'polishing and shining' drawer rather than the 'big hammers' drawer of the sound engineer's tool bench. It works best on material which has been very carefully and cleanly recorded, bringing out the very best qualities and making the whole mix sparkle and shine in a very pleasant manner. It will not make a lousy recording great, but it might make it less objectionable! Being something of an anarchist when it comes to sophisticated signal processing, I would much rather use the EQ3D to sweeten a mix than resort to enhancers and heavy multi-band compression, and I think the end results would be better too. You will have to make up your own mind, of course, but I would thoroughly recommend you try it out.

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INVISIBLE MENDING: THE AIRBAND

It may be unusual to see an EQ knob calibrated to 40kHz, but because the EQ3D uses bands which are 2.5 octaves wide, setting the AlrBand to the 40kHz position with a lot of boost or cut will still affect

audio components as low as 15kHz or so, and will therefore have an audible effect. If you subscribe to the theory that we can perceive frequencies above the nominal 20kHz that our ears are said to respond to.

you'll love being able to experiment with the AirBand. If you don't subscribe to this theory, let's just say that you might want to re-consider your views — I found it an interesting experience anyway!

control can add a beautiful warmth and weight on the right material, but can also produce speaker-destroying rumbles on poorly recorded sources. A mix which initially sounded OK on a pair of nearfields shook my living room apart when auditioned on a pair of big transmission-line speakers!

Excessive boost at the top end, particularly with the AirBand set to 20 or 40kHz, can cause all sorts of horrific problems with digital recorders — especially the earlier ones with baseband analogue anti-alias filtering. Tracks which sounded bright, crisp and full of life on the monitors during the mix often sounded absolutely terrible on replaying the DAT, because of aliasing distortions. This was caused by relatively inefficient anti-alias filtering letting a small amount of the high-level HF

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Learning

WHERE TO USE PROCESSORS AND WHY

PAUL WHITE offers a little practical advice on the application of signal processing during recording and mixing.

> ver the years, SOS has covered the workings of just about every type of signal processor imaginable, and new ones are coming along all the time. But it's not always easy to decide when these devices should be used and when they're best left switched off. If you've just spent the best part of a grand on a new compressor designed to make everything sound warm and cuddly, there's a great temptation to use it on everything — but this isn't a good idea. Processors are basically tools designed to do a job; if the job doesn't need doing, there's no point in using the tool. The idea of this article is to look at the more common types of signal processor used in the studio and to see where and how they might best be employed.

COMPRESSORS

Compressors remain one of the least understood, most abused processors in the recordist's armoury. The main job of a compressor is to reduce the dynamic range of a signal — low-level signals can be brought up and high-level signals brought down — but under what circumstances is this a good idea, and what, if any, are the trade-offs?

One of the side effects of compression is that the sound being processed changes: at the very least, its envelope is modified as the compressor goes through its attack and release phases. Perhaps the most benign side effect is that of added 'warmth', but go too far and you can introduce audible pumping, which doesn't usually sound that great unless you need it as an effect.

Most vocalists need compression to keep their levels even; bringing down the peaks means that you can make the average signal level higher, and this results in a tighter, more confident sound that sits well in a mix. However, don't just rush in and apply maximum compression — listen to the singer run through the song, watch the record level meters, and try to decide for yourself whether the voice needs a lot of control or simply a light touch. In any event, it's better to under-compress during recording, because you can always apply more compression when you come to mix, whereas over-compression is virtually impossible to reverse.

It's when you're processing vocals that the subtle differences between compressors come to light. Some models, such as the Focusrite Green I tried recently, manage to even up the level without making the process in any way obvious — it just sounds as though you have a beautifully controlled vocalist — whereas Joemeek units, for example, introduce a deliberate 'character' to the sound, which makes the vocal sound slightly larger than life. I can't say which is best, because different jobs need a different approach: the ideal situation would be to have at least one fairly transparent model and one 'warm' compressor in your rack. Some units attempt to do both, but few are entirely successful.

As a rule, if you want to make a transparent compressor produce more of an obvious effect. you can increase the ratio and at the same time shorten the release time. The shorter the release, the more obvious the gain pumping effect of the compressor. As you make these adjustments, watch the gain reduction meter and adjust the threshold control to get the amount of gain reduction you need. When you're recording, 5 or 6dB of gain reduction may be enough; if you're compressing a track that's been recorded dry, you might want to use as much as 12dB of gain reduction, or even more if you're after a strong effect. A tip here — if you're not too sure about adjusting the compressor attack and release times, use a model with an Auto setting. If you don't have one, set the attack to its fastest, and the release time to between 300ms and half a second. Soft-knee compression usually provides the smoothest compression, but



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WHERE TO USE PROCESSORS AND WHY

 hard-knee models give tighter control and may be better for creating hard compression effects.

Before moving onto other areas of application for compressors, I need to mention noise. Compressors are not inherently noisy devices, but because they reduce the dynamic range of the signal being treated, some make-up gain is needed to bring the peak signal level back to where it originally was. In other words, although compressors really just turn down loud sounds, once you've adjusted the make-up gain control, the loud sounds are back where they were and the quieter sounds are much



Pre Sonus' Blue Max compressor.

"Acoustic guitars sound smoother and have better sustain when compressed."

louder. The quietest of quiet sounds is noise, so if you're compressing to achieve 10dB of noise reduction, any noise that happens to be part of the signal will also be increased by 10dB for all input levels that are below the threshold. Periods of silence between words or phrases are most vulnerable, as it's here that the compressor gain is highest. As well as starting off with the cleanest signal you can, it might be wise to gate the signal immediately before it enters the compressor. Some compressors have built-in expander gates for this purpose: used properly, they really can make a difference.

Other sound sources you might want to compress include acoustic guitar, clean electric guitar, and bass guitar. Bass in particular tends to fluctuate in level by a considerable amount, so don't be afraid to hit it hard with the compressor. As well as keeping those peaks from clipping your recorder, compression will fatten up the tone and save weakly played notes from getting completely lost. Acoustic guitars sound smoother and have better sustain when compressed; with clean electric guitars, you

can increase the compressor attack time slightly to get a nice 'ping' at the start of each note.

Compression can give mildly distorted guitars more sustain, but I've never seen much benefit from compressing heavily distorted guitars — the mechanism of an overdriven amp or pedal essentially produces a limited output level anyway. All that will happen is that, during any pauses, the background hum and hiss will rise even further than usual.

Acoustic instruments tend to reveal compressor artifacts more obviously than electronic instruments, so for 'invisible' gain control, use your most transparent compressor, set to soft-knee if there's a choice, and a fairly low ratio —probably 4:1 or even less. Set the threshold to give you just as much gain reduction as you really need, and if there's any sign of pumping, increase the release time until it stops. A fast attack time will retain the natural attack of an instrument or voice; if you need a more defined attack for a percussive instrument, though, the compressor attack time can be slowed slightly.

When it comes to electronic sound sources, you can compress these in exactly the same way as you would their acoustic counterparts, but be aware that many of the sounds used in drum machines and synths are heavily compressed already. By all means experiment by adding more compression, but don't be surprised if you can't add much more punch to a sound.

Compressors should be switched to stereo link mode when they're treating stereo material, and I know some engineers and producers who like to compress all their finished stereo mixes, to push the average energy level even higher. Whether this is a good thing to do is almost entirely a matter of taste, but I strongly suggest that if you plan to compress your entire mix, you actually monitor the compressor output while mixing, rather than simply creating a stereo DAT tape then compressing it later. The reason for this is that compressors can change the way the balance of the mix sounds, and vocal levels in particular can seem to vary after global compression. If you compress as you mix, and monitor post-compression, at least you'll know exactly what you're getting.



Gates are relatively simple devices, and they can't perform miracles, but they can be a great help in the fight against noise, particularly at the mixing stage. Gates and expanders can only silence noise in the absence of a wanted signal — they can't 'skim off' the noise from an existing sound. Think of them as

a switch that turns off when the signal level falls below a threshold, and you have the right idea. Because a badly setup gate can fail to open in the presence of quiet sounds, or close too quickly, chopping off the tail end of a steadily decaying sound, gating while recording is risky. You might get it right — but on the other hand, you could ruin the only good performance of the day. Far better to gate when mixing, as you then



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because if you

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EQ it can be

hard or even

impossible to

compensate

for it later."

have the opportunity to run through the track as often as you like when setting up the gate. Furthermore, any noise added to the track during the recording process will also be gated

There are three main gate parameters, controlling attack, release and threshold. A fast attack means you won't miss any sharp transients, such as drums, but on a more slowly attacking sound you might hear a click as the gate opens. For this reason, try to match the gate attack time to the attack characteristics of the sound you're dealing with. Similarly, the gate decay sets how quickly the signal level fades away when the gate closes; if this is set too fast, a long decay, such as a reverb tail, might get cut short. On the other hand, if you use a long release time with a drum beat, you'll hear the noise that follows the drum beat fade gradually rather than quickly. Again, match signal release and gate release times for the best result. A useful tip is to always gate a signal before adding reverb or other time-delay effects, if you can. Not only will this prevent the reverb decay being clipped by the gate, it'll also help disguise any gating artifacts that might affect the dry signal.

If you're mixing a number of separate audio tracks, and maybe a few virtual MIDI driven tracks as well, noise can soon build up. Even if the individual sounds are fairly quiet, the added noise from 16 tracks of tape plus a rack of synths can be significant. Ideally, any instrument or voice that isn't playing all the time should be gated, so that when it's resting, the track really is completely silent. Sadly, this means a lot of gates patched into your console insert points — you can't just use a single gate and connect it to your aux send. Fortunately, you can usually get by without gating every track, simply by subgrouping the sounds that tend to play together, then gating the subgroups. Stereo subgroups will require a pair of gates set to stereo link mode. You can also put individual gates on problem tracks, such as that noisy electric guitar or hissy synth module. Having a couple of quad gates to hand is very useful, even if they're fairly simple. It's nice to have key filters, external keying, attenuation controls and so on, but, for most routine jobs, you just need a simple gate.

Some people try to gate a whole stereo mix, then wonder why it doesn't get any quieter. As I said earlier, when a gate is passing signal, it can't do anything about the noise, and most mixes have something going on all the time, even if it's just the reverb at the end of a drum fill. In most cases, the gate will open at the start of the song and stay

open until the end. In this respect, a gate can be useful for cleaning up a noisy song start, and for ensuring that the mix fades into true silence at the end, but that's about all it can do.

EQUALISERS

EQ is basically just a jargon term for tone control, which essentially allows you to turn the level of selected sections of the audio spectrum up and down. The subject of EQ is a controversial one, but I'd like to simplify it as much as possible. Firstly, natural sounds invariably sound most natural if they're well recorded and then subjected to as little EQ as possible. Change the mic, change the mic position, even change the player, but don't turn on the EQ until you really need it. Secondly, gentle EQ rolloffs at either end of the spectrum sound fairly benign, and you can also make fairly deep cuts over a narrow region without it sounding odd, but significant EQ boost over narrow regions normally sticks out like a sore thumb, especially with cheap equalisers. From this you can extract the general rule that boost should, where possible, be wider and less pronounced than cuts, which can be almost as tight and deep as you like. It also makes good sense to leave adding EQ to the mixing stage wherever possible, because if you add the wrong EQ it can be hard or even impossible to compensate for it later.

The other universal rule is that the people who could really use decent EQ don't have the access to it. You might think that those knobs on your mixer labelled EQ are up to the job, but in my experience even the better mid-price console EQ falls a long way short of what you get from a quality outboard equaliser. If you use a really nice EQ, you'll find you can add more boost without messing the sound up, and, more importantly, the sound seems to stay natural, rather than becoming honky, boomy, nasal, or any of those other adjectives commonly used to describe what you hear when you've tried to do any major equalising using the EQ on a home recording mixer.

If you're planning on using a lot of EQ — and sometimes heavy-handed EQ is the only way to get a result — treat yourself to at least one really good outboard EQ box. That way, you can use your console EQ for rolling off excessive low end, or for fine-tuning sounds, and your good EQ for occasions when a sound needs to be completely reshaped.

Next month I'll be moving on to effects, to see where they are of benefit, and where they can cause more harm than good.



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A ROUGH GUIDE TO SONG CONSTRUCTION AND ARRANGEMENT

PART 1: Great songs are 1% inspiration and 99% perspiration. BIG GEORGE mops his brow and takes it to the bridge...

ver the next couple of months we'll be looking into the most scant-regarded and often-ignored element of music: arrangement. It's a massive subject which has umpteen rules, all of which can be bent, broken and rewritten. For the purpose of this series of articles we will not be looking into how a guitar/bass/drum group get their live set together (for a detailed look at those aspects of arrangement and general musical preparation, I suggest you take a peek at SOS's sister magazine Sound On Stage).

So just how do you go about arranging a tune? The answer to that question has as many connotations as the age-old conundrum: how long is a piece of string? On the assumption that the string is two metres in length and seven strands thick, I intend to look at the long and short of arrangement for any sound that calls itself modern popular music.

WHAT IT'S NOT

Let's start by looking at what arrangement isn't:

- It's not finding a chord sequence for a song (although it often is changing the pattern of a chord sequence to make a more sympathetic harmonic bed).
- It's not writing the lyrics to a song (although it can be working out exactly what the backing singers will be doing with themselves).
- It's not deciding what the rhythm to a track is (although, in truth, it sometimes is).

Actually, the line between composing or producing a tune and arranging it is a very thin one. If you're either the producer or the composer, arrangement goes with the territory, whereas if you're being brought in by a composer or producer specifically as an arranger, it's usually to arrange the strings or the horns or the backing vocals (we'll examine those particular aspects and what the job pays later in the series). For now, we'll look at the basics of how to get the best out of a song you've written.

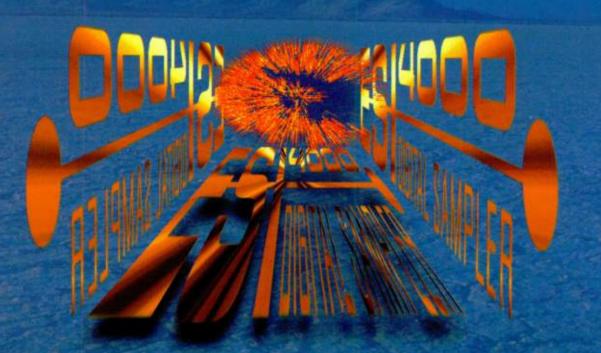
The first thing you must do is make sure that there's a reason for every part to be there — that goes for any piece of music you write. The amount of times people include four bars of nothing between sections (because it's always been there) is equal to the amount of songs that never have a hope of getting anywhere. If you're writing a piece of art that you hope will turn on millions of people, make sure that every part has a reason and nothing is missing. That's the art of writing, arranging and producing hits. Everyone knows what ingredients can be used — it's all down to the stirring, I guess. Aprons on: let's cook!

THE INGREDIENTS

THE VERSE: We all know that a verse is the part of the song which tells the story. Most songs have no more than four verses, which would include repeating the first verse at the end. Bob Dylan has written songs with dozens of verses, but none of those ever became hits. Of course, you can get away with only one verse repeated over and over again, if you want. The Red Hot Chilli Peppers, with 'Roller Coaster of Love', and Nirvana, with 'Something in the Way', are two that did.



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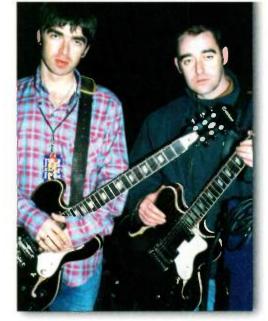
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A rough guide to song construction and arrangement

▶ THE CHORUS: The chorus is the part of the song which you want people to be singing along with by the end of the song — the first time they hear it. One easy, effective and sure-fire killer way of making a chorus lift to maximum hit-ability is to find the highest root note string sound you can and have it simply playing all the way through. It sounds corny, but just try it. It could be one of the elements that makes your track a worldwide smash hit. Ask the Pet Shop Boys what they think of this idea.

THE BRIDGE OR TAG: This is a section that links the verse and the chorus together. That music shop favourite 'Wonderwall', by the mighty Oasis, has a perfect example of a bridge, if a little long and unadventurously used ("And all the roads we have



Oasis: taking the winding road to the bridge.

ANATOMY OF A HIT: THE BEACH BOYS' 'GOOD VIBRATIONS'

THE BEACH BOYS

THE BEACH BOYS

Well-known record to see what makes it tlck. To start with, let's consider 'Good Vibrations', recently voted the greatest single of all time by the readers of Mojo magazine.

This record is more

than a mere classic, It's the Holy Grall of pop. Recording commenced mid-February 1966 at Gold Star Studios in Hollywood, towards the tall-end of sessions for The Beach Boys' most influential album Pet Sounds (although ultimately, it was not included on that album). After a shaky and uncertain start, it took six weeks of recording time, spaced out over several months, to complete the track. Moving the session between five different studios, bouncing from a 4-track machine to a stereo mix on one of the early 8-track machines, and silcing multitrack tape as he went, Brian Wilson, the Beach Boys' founder, producer and principal composer, gave 'Good Vibrations' a godlike sound.

On the finished record, 'Good Vibrations' is in the key of G flat major (six flats) and starts with the verse descending from the relative minor: E flat minor. It was probably played in the key of F (one flat) with the verse starting on the chord of D mlnor and sped up at the mixdown stage. Typical pop songs of that era (or indeed any era) usually have a basic groove running throughout the track which doesn't change a great deal from start to finish. Not so 'Good Vibrations'; this is, in Brian Wilson's words, a 'pocket symphony'. It lasts just over three and half minutes but has as many dramatic changes in mood as a piece of serious classical music lasting more than half an hour, moving from the delicate opening verse (bass, vocals, and organ only) to the soaring vocal harmony sections on the chorus and bridge, and then. In the middle of the track, dropping right down to the simplicity of a church organ pad accompanied solely by a tambourine. Of course, much of the atypical structure is due to the way the track was recorded in completely different-sounding sections, and then edited together later.

As well as the unconventional structure, the

exotic. This was a period when pop records were either guitar, bass and drum combos or traditional orchestrated arrangements for vocalists. For one thing, 'Good Vibrations' doesn't use a guitar; instead it uses a solo cello and a theremin to build the rhythm section for one section, and in another section doubles a honky-tonk piano with a Jaw's harp. The instrumentation changes radically from section to section; the bass plays in some parts but not in others, drums and vocals drop in and out, and the voices sometimes accompany fully developed backing tracks (such as in the chorus) and are in parts almost a cappella.

The beat, although the standard four-in-the bar, has a triplet feel (1 2 3 / 2 2 3 / 3 2 3 / 4 2 3) — some people call it 'threes over fours', others 'a shuffle beat'. This is the same feel as Tears For Fears' 'Everybody Wants To Rule The World' and Billy Ocean's 'When The Going Gets Tough' and many other lesser number one records. For the casual listener, the most prominent triplet figure is the part played by the cello, which saws away on the root note of the chord during the chorus.

The very first thing you hear is the angelic voice of Carl Wilson, Brian's brother, singing the word 'I' a triplet quaver before the downbeat. The first eight bars of the verse feature a heavily phased organ passed through a Leslie rotary speaker (for more on this, see the Hammond feature starting on page 40 this month). The organ plays the chords on the beat, accompanied solely by the tight bass guitar sound of Motown and Country music session giant Carole Kaye playing super-cool triplet figures. The second eight bars have a broken but rigid drum pattern played by session drummer extraordinaire Hal Blaine (alleged to have played on more hit records than any other musician ever) in tandem with a tambourine splash and a counterpoint descending French horn laid beautifully in the distance.

The 16-bar chorus was edited into the multitrack master tape at some point during the construction of the track. Like all the other edits that made up the finished record, this one is partially masked by vast reverb decays added at the mixing and sub-mixing stages. Rhythmically, the chorus is stable, but instrumentally it's wild; the throbbing cello is stretched over a straight bass and drum framework accompanied by a back-beat tambourine, and the whole arrangement is topped off by a gentleman

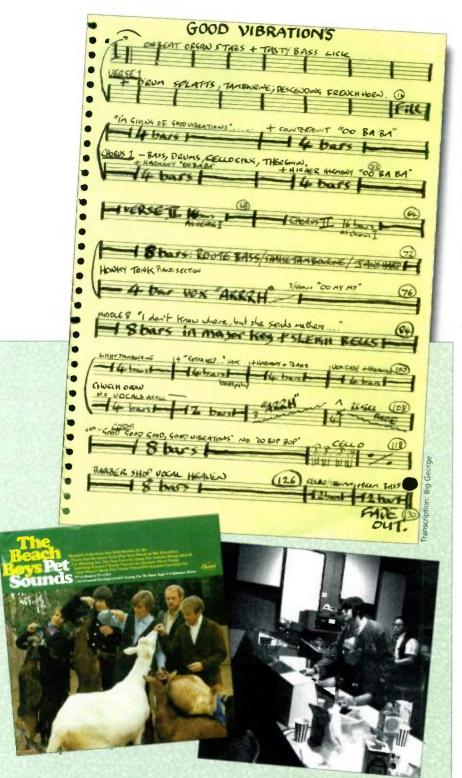
called Paul Tanner playing a theremin — most unusual for pop music of the time.

The chorus vocals are split into four 4-bar sections. The first section is the 'I'm picking up Good Vibrations' hook ilne, the second section adds an 'oo bop bop' figure (years before those Hanson boys were a twinkle in their parents eyes), the third section adds a gorgeous high harmony to the 'oo bop bop' part and the fourth section adds an even higher harmony. The structure of these vocal parts and their harmonic framework may not be the kind taught in the Royal Academy of Music, but the excitement they generate in the listener is equal to anything scratched on a piece of parchment by a long-dead composer.

A common way to develop a song arrangement is to add something to the second verse. Again, 'Good Vibrations' deviates from the norm; the second verse and chorus adhere to exactly the same patterns of instrumentation and harmony as the first time through, and the verse section is never repeated again in the song. Furthermore, the song then moves into a section that is completely out of left field; a honky-tonk plano plays with half-time feel accompanied by an on-beat bass drone, a different tambourine (shaken, not hit), a jaws harp, and more theremin low in the mix. After eight bars, there's a four-bar vocal crescendo ('aaaah'); the third and fourth bars vocally counterpointed with an angelic 'Oo my my my', which takes us into the middle eight.

Musically, the middle eight changes from the relative minor to an E flat major and instrumentally adds a sleigh bell. The vocal arrangement ('I don't know where but she sends me there...') has four separate parts which interweave so divinely the Spice Girls or Boyzone couldn't even dream them properly.

From a half-time middle eight, most people would go straight into a big splash hook-line section. Brian Wilson decided to slow the track even further, moving into a 23-bar section of church organ and tambourine by means of the most savage edit in the track. Most arrangers would steer clear of this kind of drop in pace, on the grounds that it would be chart suicide, but not Brian. This section is split into six sections of four bars (my maths is fine, just give me time to explain). The first section is vocal-less. The second section adds the line 'gotta keep those loving Good Vibrations happening with her' and at the end Carole Kaye's fat, round bass strikes up, leading into the third section which has blissful vocal harmonies and a bass line. The fourth section adds a harmonica and over the course of these four bars all the vocals



Brian Wilson (right) at work in the studio during the Pet Sounds sessions. Though 'Good Vibrations' was originally intended for this album, it was kept back for release as a stand-alone single.

fade out (again, an unconventional move). The next section is vocal-less, with just the church organ, tambourine, bass root and harmonica, as is the first two bars of the sixth and last section. On the third bar there's a crescendo vocal 'aaaah' which stops with everything else on the down beat of the last bar, decaying with delicious, distorted, uitra-analogue spring reverb to near-silence, before the next surprise: an eight-bar coda of 'Good good good, good Vibrations'. This time, there's no 'Oo bop bop' vocal accompaniment, just straight root-third and fifth block harmony, but once again, all these vocals fade out in time for the final two bars of the section, leaving the cello and bass

prominent before the final piece of singing on the track: eight bars of rapturous barber shop-type vocal harmonies. There are no words, just 'dos', 'bas' and 'oos'. As if this wasn't unexpected enough, the final playout is then heralded by two bars of just cello and very prominent theremin before the drums and bass kick in for the final two-bar fade-out with full instrumentation. The exotic instruments, the complex vocal arrangements, and the many dynamic crescendos and decrescendos all combine to set this record apart from most pop music. In short, if there's an instruction manual for writing and arranging pop songs, this one breaks every rule.

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it. (For chords with more than three

notes, see 'Posh Chords' box).

playing like Liberace before you know

that moves up and down the keyboard, never changing, try using

play are (C) (F) (G), rather than

through that new-fangled MIDI thing,

you're not a classically trained pianist or a gifted jazz lvory-tickler, and that

A rough guide to song construction and arrangement

▶ to walk are winding..."). The song also has the 'two verses at the beginning' trick (see next section).

THE MIDDLE EIGHT (or, as James Brown would shout, "Take it to the bridge") is a third melodic part, usually placed after the second chorus to break up the song pattern. It's called a middle eight because it's usually eight bars long, but there's no law saying it has to be that length or even there in the first place — whatever feels good and fits the bill. No-one has ever done a study on this but I would hazard a guess that 50% of records have a middle eight, and of those, 50% are eight bars long. Michael Jackson used this device for effect in 'Billie Jean' ("People always told me, be careful what you do..." — which, by the way, is eight bars long).

A KEY CHANGE: Why? Because it can lift a song at that difficult 'two-thirds of the way through' stage, where the listener's interest is beginning to waver. The usual key change is to move up a tone (from A to B, for example). It's advised, for maximum effect, to build into this with a huge drum break or a dramatic pause. Key changes down are seldom, if ever, used, because they give the opposite effect of uplift. And note that more than one key change per song can be more annoying than exciting. There's a classic example of a key change in the Whitney Houston hit 'I Will Always Love You'.



Listen to Elvis Costello's 'Accidents Will Happen' for a good example of an exciting coda.

THE CODA is a cool way of ending a track. It's either the chorus hook repeated continuously, or a new section used to tail off a track. One of the most exciting codas used in popular music is the end of Elvis Costello's 'Accidents Will Happen' — the bit that repeats the words "I Know", ad infinitum.

THE NASHVILLE NUMBER SYSTEM

In the last decade of the 18th Century, the centre of the music world was Salzburg, Austria. Two hundred years later there is no more productive music city on the planet than Nashville, Tennessee. Whether you like country music or think it's a pile of twanging nonsense, the fact remains that there are more studios, producers, arrangers, composers and musicians making music every day in a square mile there than anywhere else on earth.

Though this is more to do with songwriting than arranging, there's a most remarkable thing about the way that music is made there, which can be of great benefit to musicians of all tastes: instead of musical notation and chord progressions, they use something known as the number system. Numbering the notes of the scale from one to eight (the latter being an octave higher) and applying those numbers to chords means that a song is seen as a numbered pattern of chord changes, regardless of what key the song is in. It may seem an odd way of looking at music, but don't knock it until you've tried it — whatever flavour of music you

deal in. It makes learning new songs easier, changing the key to a song a doddle, and understanding what makes other great songs flow so well more straightforward. It would be completely out of order of me to suggest that looking at a number of great songs by other artists as a set of chord numbers, and picking the bits you want to use as a blueprint for your own song in your own comfortable key is a good way to start a new song. If only because this article is about arranging and not songwriting.

Anyway, every musical key is numbered in the table below. A number on its own signifies a major chord; in the key of C, a 1 is read as C major. Other "flavours" of chord are created by a simple shorthand; for example, if you want a B, minor in the key of C, a minor chord based on the flattened seventh degree of the scale, if would be written as \$7. Nashville convention implies a particular kind of chord for each step of the scale, although this is always fully notated to avoid ambiguity:

1 = major

2 = minor 7th (2-7)

3 = minor 7th (3-7)

4 = major

5 = major

6 = minor (6-)

7 = 7th (7/7th)

So while the 6 chord would normally be minor (notated as 6-), you might want it to be a major or major 7th (6 or 6/7th). And remember, changing a chord from major to minor and vice-versa could make the difference between a massive hit and just another song.

Incidentally, the 6- chord is the relative minor of the key. (In the key of C it would be A minor.) Which means that the same notes are used in the relative minor key of A minor as are used in the major key of C. This may not seem that interesting, but if you use it in the correct way it can make you as rich as Eric Clapton. (Eric Clapton has based his entire guitar playing style on exclusively using relative minor scales, and he's not the only one, by a long shot.)

1	С	C#	D	E	F	F#	G	G#	A	B,	В
2	D	D#	E	F#	G	G#	A	A#	В	С	C#
3	E	F	F#	G#	A	A#	В	С	C#	D	D#
4	F	F#	G	Α	8,	В	С	C#	D	E,	E
5	G	G#	A	В	С	C#	D	D#	E	F	F#
6	A	A#	8	C#	D	D#	E	F	F#	G	G#
7	В	С	C#	D#	E	F	F#	G	G#	A	A#
8	С	C#	D	E	F	F#	G	G#	A	В,	В

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A rough guide to song construction and arrangement

POSH CHORDS

Here's a list of every chord used in music, ever. They're only in the key of C. To find out what they are in other musical keys, either use your musical transposing skills, or the transpose button on your keyboard or sequencer. Try them out — you'll sound like a musical genius.

- = MINOR \(\Delta = MAJOR 7th \)
+ = AUGMENTED \(\text{o} = DIMINISHED \)

C6 = CEGA C6/9 = C E G D A C+9 = C E G D CA = CEGB CA(13) = C E G B A Cmi9 = C E G B D Cmi13 = C E G B D A C7 = C E G B C9 = C E G B D C13 = C E G B, D A C-6 = C E G A C-6/9 = C E, G A D C-+9 = C B G D C-7 = C E, G B, C-7+11 = C E, G B, F C-7+13 = C E, G B, A C-9 = C E, G B, D C-11 = C E, G B, D F

C-9.5 = C E, F# B, D C-11,5 = C E, F# B, D F Co = C E, F# Co7 = C E, F# A Co7+ Δ = C E, F# A B

C-13 = C E, G B, D F A

C-1 = C E. G B

C-9A = C E, G B D

C-7,5 = C E, F# B

C+ = C E G#

C7sus = C F G B
C9sus = C F G B D

C13sus = C F G B, D A

CA#5 = C E G# B CA#11 = C E G B F#

Cmj9#11 = C E G B D F# Cmj13#11 = C E G B D F# A C7 5 = C E F# B_b

C9 5 = C E F# B_b D C7#5 = C E G# B

C9#5 = C E G# B, D C7,9 = C E G B, C#

C7#9 = C E G B Eb C7.5.9 = C E F# B C#

C7#5#9 = C E A, B, E,

C7#5,9 = C E G# B, C# C7#11 = C E G B F#

C9#11 = C E G B, D F# C7,9#11 = C E G B, C# F#

C7#9#11 = C E G B E, F# C13 5 = C E F# B, D A

C13.9 = C E G B, C# A

C13#11= C E G B, D F# A C7sus 9 = C F G B, C#

C7sus 9 = C F G B, C# C13sus 9 = C F G B, C# A

C∆sus 5 = C F F# B



 Of course, 'Bohemian Rhapsody' doesn't fit the patterns explained here, but all but a handful of the tens of thousands of top ten hit records before and since have.

PIECING IT TOGETHER

Let's assume that your song has the following conventional structure:

Verse 1 Chorus Verse 2 Chorus Verse 3 Chorus Verse 4 Double chorus

How do you make it more interesting?

- The first thing to add is an intro. It could simply be a vamp of the opening couple of bars of the verse or the final four or eight bars of the chorus.
 Then again, four bars of drums at the beginning of a song never goes down badly either.
- Try getting rid of the first chorus by sticking verse 1 and verse 2 together.
- Then, after verse three, double up the chorus, drop the last verse down a gear and make it a middle eight. Halving the rhythm track or changing the fourth chord to a minor second chord is a good way of going about this.
- A middle eight section is a great way to set up the final chorus onslaught (see 'The Nashville Number System' box).

TEMPO

Beats per minute (BPM) first became a science in the mid '70s, when various producers using early sequencers to make dance music worked out that 137bpm was the optimum speed to excite the human heart rate whilst dancing (137—the disco heaven). Since then sequencers have become an awful lot more sophisticated, as has the BPM awareness of the music makers. These days there are more pigeonholes in which to place music than ever before: house and garage tracks tend to fall betwen 130-145bpm, jungle in the 165-170bpm bracket, and happy hardcore between 170 and 175bpm, but all boms are subject to change on the whim of a single track, which could be yours. There are some styles of modern dance music which have very eclectic tempo constraints: techno can go from an industrially moody 80bpm to a brain-smashingly bizarre 500bpm. If you're thinking about trying something in a new style for you, do some homework first. Dance music is an exact

business, and close scrutiny of the current market leaders is essential to understanding the form and arrangement. A visit to your friendly local specialist record shop with £20 in your pocket will give you the best overview of what is the current norm. And in dance music, being current is everything.

Even if you're not a dance music expert and have no intention of dipping your toe in that particular beat pool, tempo is still an issue. A couple of tricks that are seldom used these days, but were common practice up until the Linn drum came onto the scene, involved speeding up the track, both gradually and as a whole.

Tracks would speed up naturally during the recording of the backing track, which is something that doesn't happen these days. If you use a sequencer but don't use loops, try notching up the BPM of your track every verse and chorus. Starting at 120bpm and ending the track at 125bpm can give a sense of urgency without the listener having the faintest clue what's going on.

The other way of speeding up a track which used to be used on a very regular basis was to slow down the mastering tape machine by a factor of 8.5% at the final mix stage. When played back at normal speed, the finished master would be slightly over a semitone higher in pitch. The reason for this was that it made the playing sound a bit tighter, particularly the drums, and gave the overall sound a bit of a toppy edge. On the downside, it made working out songs from the record difficult, because they were often slightly out of tune.

CODA

It may seem that some of the aspects we've covered have strayed into production or composing, but as I mentioned at the beginning, the line is a fine one. Next month we'll look at instrumental arranging, including adding horn and string parts, both sampled and real, basslines, rhythm structures, and fancy arrangement tips.

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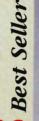
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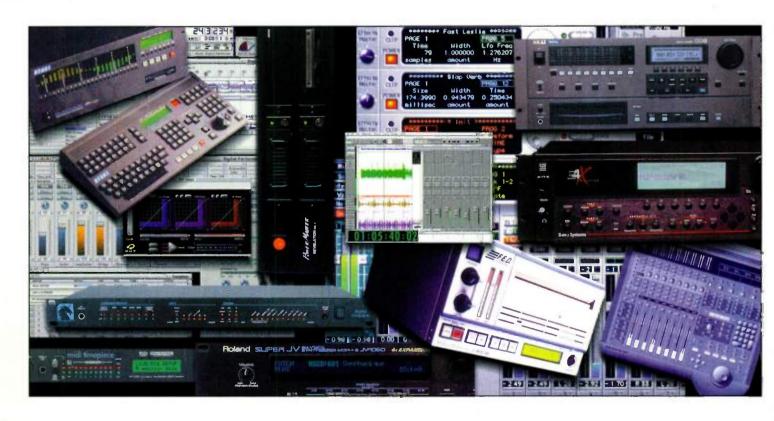
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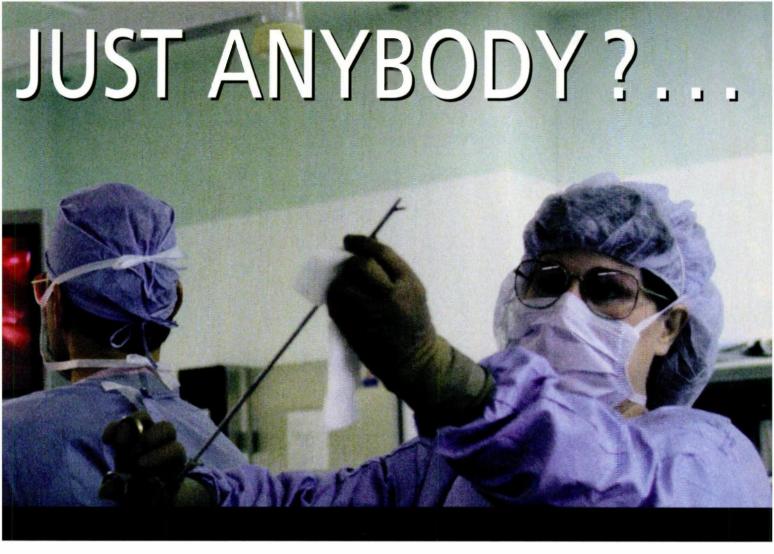
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COLDCUT . NINJA TUNE

Innovative musicians, DJs, entrepreneurs, technology intellectuals, artists...Jonathan More and Matt Black mix up more than just records to make Coldcut. DEREK JOHNSON & DEBBIE POYSER meet up with the Ninjas to talk zentertainment and audiosyncrasies...

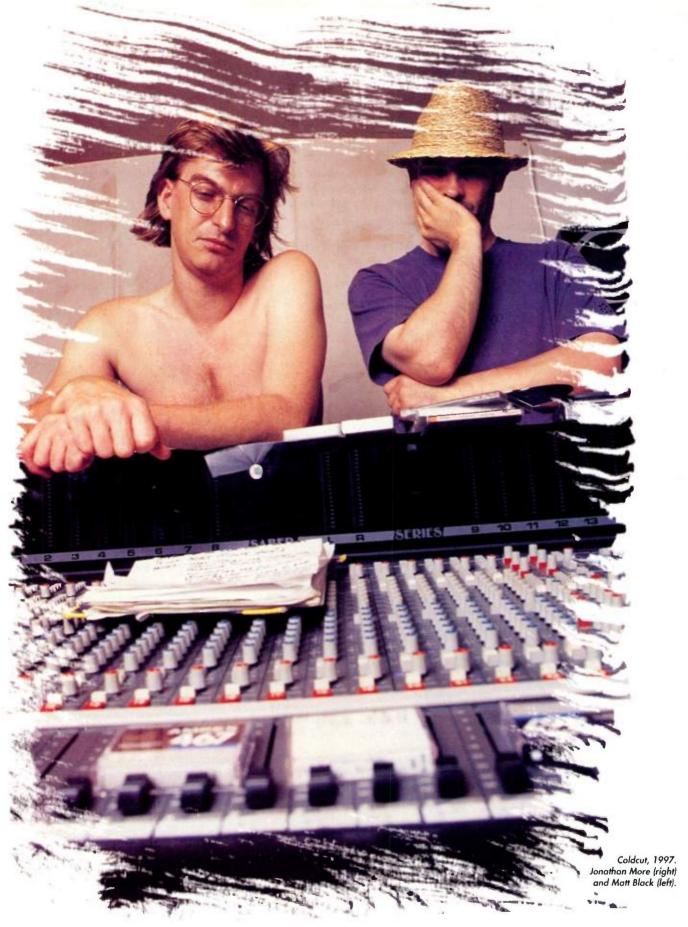
t's the middle of a sweltering afternoon in the hottest August in living memory as we wait for our appointment with two of the coolest figures in the recent history of popular music. Matt Black and Jonathan More, collectively Coldcut, are only slightly late for the 3pm SOS interview, having just completed a telephone interview with an overseas magazine. We slouch on the funky skip-salvaged furniture of their sunny London warehouse premises, while they stretch out on the scruffy wooden floor in front of a pair of loading doors, opened wide to encourage the sluggish air to circulate.

Elsewhere in the informal suite of rooms, staff are administering the record label and zentertainment empire which is Coldcut's Ninja Tune, an outlet not only for Coldcut but for other artists they've signed to the label. We're here to talk about the release of two new Coldcut records, Let Us Play and More Beats & Pieces, the latter marking the 10th anniversary of Coldcut's seminal cut-up single Beats & Pieces. For the More Beats & Pieces project, Coldcut pressed up 30 copies of a vinyl album containing audio material sourced by themselves, and distributed them amongst fellow musicians/DJs,

to do with more or less as they wished. The raw material, says Matt Black, was "influenced by the stuff that we had on the initial *Beats & Pieces*, so most of the drum breaks were evolved from the original loop, which was a sped-up 'When the Levee Breaks' by Led Zeppelin. But I've always felt that break could be a lot heavier, and with [drummer] Paul Brook, the guy we work with, we sorted it; by amplifying certain beats of it and cutting it up, we made it a lot heavier. We recycled it."

The musicians chosen to contribute to the album were, according to Jonathan More, "people we were into; like Tortoise, we've been into their shit, met them in Chicago; Kid Koala, we've signed him to the label, met him in Canada when we were DJ'ing over there; Strictly Kev, DJ Food and Ollie the Herbaliser." Matt: "We go for people we respect, not people liable to sell a lot of records for us. Big record companies just use remixes as a marketing tool, and they just get in whoever's tart of the week to do it. You could say that we're no different, except that our level of assessing who's cool at the moment is much more rarified, and we actually know these guys. It's a different issue, really, because with remixes as a marketing tool, an artist on a major label just has their stuff given away to whatever old tart is in town, and the artist pays for the privilege... there's no choice. It's happened to us - we were mugged by the Dirty Rotten Scoundrels and it's not very funny. But if it's the artist choosing it, saying 'here's some stuff of mine, I just want you to do an interpretation...' The term remix is awful anyway; version is better."

The revisiting of *Beats & Pieces*, in the shape of *MB&P*, is much more than a marketing exercise. It's more like Coldcut's way of celebrating the vinyl cutup techniques that went into producing the original release — and starting to bid a fond farewell to them. Matt Black: "With *More Beats & Pieces*, the sound is what you get with direct vinyl manipulation. That kind of chopped, extremely aggressive, analogue manipulation is something that you can't actually get



by any other means. We love vinyl, and we love scratching, but vinyl isn't actually going to make it. Sad as it is, we're going to have to wave goodbye to that, and it's going to become increasingly a specialist preserve. To stay alive, we've got to move beyond that or die out like some prehistoric animal. It's like yin and yang: analogue/digital, scratching/hard disk recording... It's by balancing those things that you'll

achieve longevity, I think. Shops aren't going to stock vinyl any more, though it's lasted a lot longer than a lot of people thought, mainly due to the dance market. But I think I'll be on a fairly safe bet if I say that in 100 years time there won't be any 12-inches produced! We're celebrating where we've actually got to — not just us, but the DJ fraternity — in terms of what can be done with fucking around with sound using



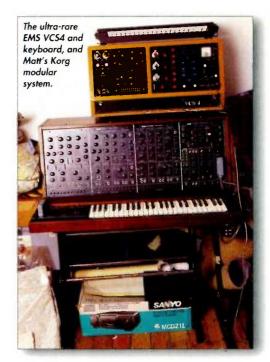
COLDCUT • NINJA TUNE

decks, but at the same time we're sort of starting to say farewell to that, looking to the future and seeing if our skills can be kept alive and evolved using other technology. We think they can, and that's the idea of the Digital Jockey... A DJ plays with recorded sound; a Digital Jockey is the same, except with recorded data, which can be sound, or anything else."

THAT'S ZENTERTAINMENT

Talk of the Digital Jockey brings us neatly to Let Us Play, the other new release we're here to discuss. Even the title hints at the Coldcut philosophy: let's play — but let's play seriously; let's put something in and get something out. They call it 'zentertainment'. So what is it? Matt: "Zentertainment... it's another new word when we'd promised not to make up any more words". Jonathan: "Entertainment is a major market: is that all it is? Is it just a commodity? Or is it possible to mix it with other things, because we like mixing things up. If you mixed it up with ideas of interactivity, and DIY culture and information, and call it zentertainment..."

The excellent Mac and PC CD-ROM given away with Let Us Play encapsulates the zentertainment idea (and gives an A-Z of other words Coldcut have made up...): the music is there, but mixed in with it is the innovative use of video and visuals that's been such a large part of Coldcut's fruitful partnership with Hex multimedia, plus a Ninja Knowledge quiz and some fun interactive software tools. These include My Little Funkit, a "DIY DJ toy" whose three banks of loops can be used to remix Coldcut, and Playtime, a "beat-based algorithmic music generator." The CD-ROM also features an



information archive called Infobone, in which the pair enlarge on the philosophy they seem to live by. Which is? As far as you might make it out: stay independent, be active, make music, provide a catalyst for new forms of expression, bring people together, be political, develop new musical tools. "work to live, not to eat, experiment with new structures. Consider an example of an alternative mentality to organisation. Navigate a path on the scenic route."

Anyone taking a peek at Infobone will also discern the traces of Coldcut's own bad times within the record industry ("near-death experiences with Big Life and Arista"), following their pop success with such artists as Lisa Stansfield and Yazz. For anyone not familiar with this period, Jonathan More enlarges. a little reluctantly: "I don't want to spend all day lunching out on this because we've lunched out on it a lot. Basically, they [Big Life] were an independent label, we got signed to them, they're hardcore businesspeople, know how to make money very well, and proceeded with that course. We were fuel that lit the fire. Once our candle was used up as far as they was concerned they weren't interested in our new special extremely lovely fuel. They were sorted out... bosh. That happens to loads of people. You're a commodity. They were then bought by Polygram, and then the whole major label syndrome started kicking in, then we were bought out by Arista, and they continued with the same sort of stupid arrangement. They're monolith dinosaur creatures that don't know how to react, a lot of them, and they're not very cool." Lots of musicians don't survive this kind of situation, but Coldcut did, demonstrating the streak of determination that's brought them to where they are now. Jonathan: "It was a psychic fight. and a lot of the reason Coldcut were quiet for quite a long time. But I'm a stubborn bastard, and I wasn't gonna let it stop us."

"We could just say that we had a period of pop success where we could make some money, which fuelled us to start Ninja Tune, but it was a lot more messy than that", adds Matt. "We nearly

FAST FOOD

What do two pioneering, seriously creative samplists such as More and Black think of the trend for basing tracks completely around a repetitive sampled hook from a previous hit record, just topped off with a rap, or the vaguest attempt at a new song?

Jonathan: "I don't let it worry me, in the same way as I don't worry about eating a McDonalds burger. Or about any of the other associated pieces of fodder..."

Matt: "It's an available ecological niche, which is being eaten out to extinction pretty rapidly, along with a lot of other resources."

Jonathan: "It's like buying a T-shirt with the Mona Lisa on it. Or, you had Picasso who defined that beautiful thing that was his take, and then you had the ashtray with a kind of squiggly pattern, a bit like Picasso, on it. It's like buying the ashtray, really."

Matt: "One shouldn't neglect also the sense of kitsch, and not take any of this too seriously. The whole scene is hugely amusing. It's like parodies of parodies."

Jonathan: "Some of them work a treat."
Isn't it all a bit too easy, though?

Matt: "That's Jon's point: it is easy, and it's easy to get a burger at McDonalds. So a lot of people do that, so there will be a market to fill that need. But

so what?"

Jonathan: "Who's the best griller at McDonalds this week?"

Matt: "We could have the awards this week for who's best griller at McDonalds, and pretend that's news. Meanwhile, we've gone to have a picnic somewhere else."

What about commercial sample CDs?

Jonathan: "Yeah, they're all right. If you want a Botswanan nose flute — not a lot of people are using them these days — you're bound to find one on a CD!"

Matt: "We'd settle for a good cardboard tube! I think we under-use sample libraries, because, yeah, other people are using the same samples, but other people are using the same records. The fact is that if you give 10 producers the same 20 samples, they should all come up with something completely different. Once you start layering and processing and chopping and recycling, I don't think you'd even recognise the shit. We work with Paul Brook, and he's the Real Drum Company. Drum breaks are our greatest delight and need, so we're pretty well catered for in that department, and for the other mad shit, we've got our record collection."

Jonathan: "I like those sample CDs that have weird percussion; you can sample it, time-stretch it and treat it and stuff."

Matt: "There's a lot of cheese about, obviously."

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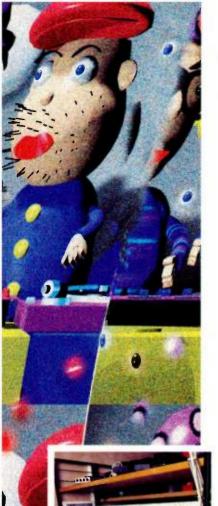
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lost it. A lot of other people don't make it; they come up innocent, full of love and ideas, and just get trommelled, never heard of again."

"It's a polishing machine, the industry", comments Jonathan. "You put all the stones in, and some of them look wicked when you pick them up off the beach because they're all rough, but they've got a texture that's really beautiful. Stick them all in the polishing machine and those aren't necessarily the ones that come out looking the best... some people don't like the rough edges taken off, and that's us, to a certain extent."

Which all explains Infobone's exhortation to "help render redundant the feeble, cash-bloated efforts of the grey face con majors." And elsewhere: "With increasing speed THEY seem able to zero in on new underground hybrids, capitalise, sterilise, and yet there is a way to kill these muthafuckers, because as fast as they suck, new forms spring up. Speed that up. Stop buying stuff and start making it - yourselves - with love - with fun. Overwhelm the Con with quantities of the qualities they don't understand. Let the people create. Let us Play." It's a stirring message, but begs the question of whether it isn't just human nature to see a new trend and to want to copy it. Matt: "It's possibly an unfortunate tendency, but maybe that's the way things are. In every flock of 100 sheep, there's one black sheep that's gonna go in the opposite direction. And it's those black sheep that are gonna - let's mix the metaphor! - lay the seeds of the next interestingshaped plant. If more people were playing with the music rather than just playing the music, that would be progress. It does seem that certain people want to play with the music, because of the large number of DJs there are..." Jonathan joins in: "That's why we've done those two things on the CD ROM - Playtime and My Little FunKit. The immediacy of My Little FunKit is very attractive to a lot of people right away, because it's very

easy to use, and easy to get results, which is something that Matt and I wanted, because we're into things that do that. *Playtime* is quite a lot deeper; you don't really know whether you're having an effect or not, but it does make some of the most outrageous patterns that you're likely to be able to get out of anything at the moment.

"We'd like people to take those and do things with them, and if they send them to us and they're brilliant, we'll put them out. In a way, it's a development of DJ Food and the breakbeat DJ culture of providing pieces for people to do their own thing, and it is a hip-hop attitude. Hip-hop has had a thing about being educational, edutainment; it's supposed to have that sort of vibe... the *real* hip-hop, I'm talking about, not the R&B sell-out."

THE PLAY'S THE THING

Musically, Let Us Play is an absorbing listen. beautifully crafted and with lounge-flavoured melodic interest. More than a few tracks were derived from jam sessions set up by Coldcut between themselves and selected 'real' musicians, and the watermark of this sophisticated method is audible throughout the album. Jonathan: "With the whole album we wanted to get away from one bloke or bird at a computer sequencer, with a load of people standing around going "yeah, that's nice" or "why don't you make the snare a bit louder?". When you work with your computer, it's very easy to become insular, and that leads to a lot of linear music. Club music is about linearity in a way, but it's also about light and shade and variety." Matt: "In a way, it was an attempt to escape from the sampler/sequencer dead end, which we've been doing for quite a few years now, as have a lot of other people. It's fantastic to be able to do a whole orchestration on a sequencer with one person. But if you're more than one person working, it can be very frustrating, and you tend to find that you work in four-bar sections,

LIVE TALKING

Though Opcode's Studio Vision is now Matt and Jonathan's software of choice for sequencing and some audio recording, custom Coldcut software Is also in the offing. At the time of our interview, the two are running somewhat late on planning for a secret gig due to take place the following weekend, and they've been giving some thought to how Digital Jockeys could present themselves in a live situation. Matt: "We're going to have laptops running our custom software, which enables you to sequence and sample at the same time, based on the toys on the CD-ROM. That might be a future direction... We'll develop the software and sell it, as a performance and composition tool. It's like [Steinberg's] ReBirth... wicked. We're thinking of new types of software to be as compact, mobile and flexible as possible. There's a few approaches to live dance music. Get a band of session musicians - if you're pretty successful, you can afford to hire top session musicians - and get them to recreate the music you've created on your computer. That's the M People solution. The humans play pretty much the

same thing every night, but I feel it's a bit of a waste of human potential..."

"There's the sax solo, though!" interjects
Jonathan ironically. Matt continues: "You get the sax
solo, and all the audience applauds, because they're
conditioned like Pavlov's dogs to do that when the
guy gets his sax out. Then you can take all your gear
out on stage, the Orbital-type approach, and hope it'll
work. It's a pretty humongous task..."

"It can be brilliant when it works... or it can be shite", offers Jonathan.

"...And there's the DJ solution, where you basically take your records out, mix up the records, and get billed as a DJ — not as being 'live'. The studio solution includes taking a DAT on stage and pretending; have the usual amount of gear around you so you've got a few knobs to play with. But none of those things is particularly satisfactory. So we're considering a kind of hybrid, effectively: the session musicians are us, we are actually performing, and the studio is contained in a laptop, and the DJ element is contained by the fact that the tunes that you've

made exist as samples in the laptop, which you can rearrange and mix in various ways in real time. A lot of people just use an ADAT or whatever, which is OK, but it would be nice if the audience knew what they were getting. The whole term 'live' should be abolished. All these situations are live to a certain extent." Jonathan: "You can use turntables as well on top, to kind of add further depth." "Analogue backup", agrees Matt. "It might not be appropriate to have long vocal samples sampled up in the laptop, so perhaps we might cut a record with a capellas on, and we can actually scratch that up, running it live from the decks."

It's a pretty radical approach, using little conventional stage or studio equipment. "Not guitars, or drums, or bass. Maybe synths?" queries Jonathan. "Probably not synths and samplers either. It's not necessary", responds Matt positively. The pair are clearly creating on the fly, throwing ideas back and forth. "If we want to have a keyboard player to come and jam with us, then we can do that — that's no problem. We're not cutting ourselves off from that. The basic idea is to take what a DJ does, but do it with laptops, with enormously greater flexibility."



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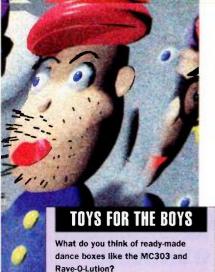


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Jonathan: "It's understandable when a TB303 is a grand now, and a bastard to program.'

How do you feel about the auto accompaniment aspect of this kind of

Jonathan: "Excellent! I love shit like that. Some of the stuff we've done, we take a Yamaha PSS780 £200 keyboard [with built-in autoacompaniment and pads for triggering patterns and sounds], take the MIDI out of that and hook it up to a sampler, see what happens and sample it back."

Matt: "With the over-use of breakbeats, something like that starts to sound refreshing."



soul; if you see the video, it's just pure raw real experience." The track, which you can check out with accompanying video on the Let Us Play CD-ROM, has a very palpable atmosphere, contributed partly by the intriguing snatches of speech, some of which, in particular an anguished female vocal snippet, have been tailored to complement the backing track perfectly. Jonathan comments: "We tuned her in places. You get a phrase, and it takes a bit of work to sit in the track." Matt: "A lot is tuning... It's great, that feeling of whacking a sample in there and finding it works, but invention is 99 per cent perspiration, so it's worth giving it that extra time sometimes. It's amazing how much your head puts into stuff. It's funny how much a sample sounds good, and you can move it, and it can sound equally as good on another beat, because your head starts hearing the two things and drawing conclusions."

The pair have obviously put "that extra time" into Let Us Play, whose disparate elements sound as though they were born to be together. Jonathan: "With some of the tracks, like 'Return to Margin', there was so much going on that it needed to be carefully 'tamped down' as I put it... It just takes a lot of time." Matt: "Let's face it, there was a pretty anal approach to polishing and burnishing and getting it right on this album; it's taken quite a while." Jonathan: "We don't use a lot of reverbs, the tracks are quite dry. We tend to write a lot of the tracks mono, flat, then when we go to a studio that's got a lot of ability to patch things up, that's when we start kind of stretching it. I don't like loads of reverb, because it can tend to make sample-based music, or music that's got reverb in the sounds already, sound shit. A lot of outboard gear comes with reverbs in it, and people just don't switch them off, which is why it sounds all the same. If you switch it off and use something else, you can get an entirely different sound. Switch your reverb off and try some other things, and you might find some interesting results."

NATURE OF SOUND

For two such seasoned sample gatherers as More and Black, the nature of sound is obviously very important perhaps more important than the melodic content of a track? Jonathan demurs: "No, I like melodic shit, but I don't like to overstate it; it's pretty easy to ram it into peoples' faces. I like melodies, they come out of weird shit. Like on 'Return to Margin', there was a loop of electronic blips which we cut up and looped, and I could hear this melody. Eventually we worked it out, and that became the vibes melody. It was in the loop, possibly just in my head, because nobody else could hear it." Matt: "That's an example of the sort of interference effect that you get if you've got two things playing: the two waves start interfering with each other, and they actually generate from that some kind of offspring vibrations, which might actually be quite subjective in the way that you perceive them, but are there.

"I think the main difference between the kind of music we're talking about and 'rock' is that we're more interested in sounds. I was watching Glastonbury, checking out the endless succession of blokes with guitars, and the kind of droning insistence of what they were doing didn't touch me at all. After a while it occurred to me that it was because the sound isn't interesting --- it doesn't change. If you've got incredible dynamics in a vocal or an incredible performer or incredible lyrics, that can compensate to a certain extent, but when it's the guitar, the bass and the drums just grinding on... Yeah, it's a wall of sound, but it's a pretty fucking..." "boring, whitewashed breezeblock kind of vibe ... " adds Jonathan. Matt continues: "Yeah, it's not inspiring you to look over the other side of it. Our music, dance music and all these abstract musics - which should be called digital because it's all made with MIDI they're much more about interesting sounds and level of sounds and textures, and using voices as textures. That's the main difference, and it's why I think rock isn't doing it."

NINJA GEAR

Alongside the sprawling Ninja Tune office is a small studio where Black and More record their Kiss FM radio show and do some of their album work. It's recently undergone some changes, becoming rather more complex and certainly more up to date. Matt: "We're actually - shouldn't admit this, really - in the quite sad position that our studio is so complicated that Jon or I cannot actually turn it on and guarantee it will work and know how to fix it if it's not working. So we have an engineer, who's very knowledgeable, to sort those things out."

One of the most significant changes has been a move away from the Atari ST running C-Lab's venerable Creator, though both insist that they still like the Atari/C-Lab setup and find it very fast to use. Nevertheless, times change. Matt: "We abandoned



Black and More by one of their racks at the Ninja Tune studio, containing (top to bottom): Korg Stage Echo, Eventide H3000 UltraHarmonizer, Boss SE50, Yamaha SPX90 MkII, Maxim delay, Drawmer LX20, Akai S3000, Zip and Syquest drives. Waldorf Microwave, Behringer Composer, Emu Morpheus, Oberheim Matrix 1000, TC Electronic 1128 graphic EQ, Roland MKS50, Ibanez AD230, Cheetah MS6, Opcode Studio 4, and EMO power amp.



The Let Us Play CD-ROM has a neat VCR-style user interface.

that near the beginning of the album, and moved to [Opcode's] Studio Vision on the Mac." Jonathan: "Still trying to learn how to use it... We made a decision before we started the album to go a bit further with the gear. Up until that point, we pretty much had some outboard, Akai S3000 and the Atari running Creator. We'd also got some old Syquest drive for samples, which is pretty clumsy, and we built up this enormous shelf of Syquests, which was getting ludicrous. Now you've got Zips for no money down and about eight times the capacity of our ancient device, and very quick, so we moved onto that. We did that at the same time as trying to do the album, so it has been a bit of a nightmare trying to cross over. We've gone from a position of quite ignorant gear that was dead easy to control, to a position of lots more ability to do things but a lot more ability to get it wrong, badly..."

Matt: "We're sorting our library out at the moment: we've got about 14,000 samples on about 4Gb of hard disk, which we're trying to arrange into categories. How does one arrange 800 phrases, some of which are just one word, some of which are lengthy rants? We've come up with categories. The guys who don't want to be labelled are trying to label their sample collection... It'll pay off in the end, because we're going to cut it back onto CD and make it accessible to the Mac and the Akai."

The aforementioned Akai is a 32Mb S3000 (Jonathan: "still pretty decent for a lot of things"), which is still undertaking sampling duties, though the audio side of Vision also provides extra recording capacity, as does "a Newmark DJ mixer which has got a little four-second sampler on it." Synths don't figure large in the Coldcut scheme of things; when asked if there are any synths he wouldn't like to do without, Jonathan responds that "I could do without them, I suppose. We used a Korg Wavestation — not ours — on the album. It's got some quite nice sounds, and it has the wave sequencing function, which we used for 'Music For No Musicians', but I'd be quite happy to live without it. I haven't rushed out and bought one. We've got a Waldorf MicroWave, plus programmer jobby. It's alright, got some good basses, but, funnily enough, we hardly used it for this album. There's Matt's big Korg modular, which came in in some places, and there's the Roland JD800. Even though I'm getting pretty

bored with it, you can still surprise yourself by frigging the knobs until you get a decent sound out of it. Just get hold of it and do it. I hate things that are complicated. I just want some sounds, and I want them now."

At this point Jonathan leaps to his feet and reveals the reason for the presence in the room of a pink plastic Sindy disco which we had assumed was just part of the Ninja decor. Firmly fixed to Sindy's dancefloor is a miniature console with buttons which trigger

preposterous but interesting booming and distorted drum patterns, obviously sampled into about 3K of RAM chip at a sample rate of half a kHz. Jonathan: "I love it. I use whatever comes to hand. I like things that are straightforward like that." With childlike enthusiasm he grabs a see-through glitter plastic device and begins triggering another set of Taiwanese kiddy-grooves. Evidently, it's all there to be used...

Back in serious studio-land, the outboard rack is pretty well stocked (see the 'Gear List' box elsewhere in this article) with effects and processing units, including a Boss SE50 and "an old Maxim delay which is pretty outrageous. We're buying loads of gear at the moment. There's a TC Finaliser, which we used quite a lot on the album. We recorded vocals into *Vision* and used the Finaliser to sort out compression. We actually record vocals onto ADAT first, then into *Vision*. We do quite a lot of work with ADAT.

"We've also got a Peavey thingy that does all the MIDI data with sliders, a PC1600, which is quite a laugh. We also used that on 'Music for No Musicians'. We set all the filters and everything on the S3000 and just play the PC1600, then had another bank, which was the volumes. We did the filters and recorded all those in, then did all the volumes and put those in. We just jammed several times with that track live, as it were, back into the sequencer, and recorded loads of information, and where we didn't like it, we just dropped out and dropped back in again."

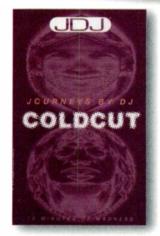
Looking around the room, we spot the distinctive 'Darth Vader's frisbee' shape of the Notron sequencer. Matt opines that it is "Totally wicked, serial number 1. We'll get some value out of it sooner or later. The couple of times I've played with it, I've had a wicked time. I'm really into alternative performance input devices."

TEA, BOYS?

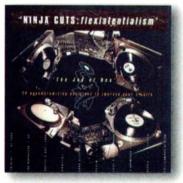
The interview winds up as the record label bosses for the millennium make it known that they're keen to get on with business. As we prepare to leave they're diving back into Ninja work mode, Matt in keen consultation in front of a video screen, and Jonathan catching up on some phone calls. Earlier, impressed to hear that they obtain sample clearance personally, we'd asked the pair if they do *everything* themselves. Matt: "We don't make our own sandwiches". Jonathan: "We sometimes make the tea."

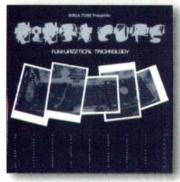
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KORG Z1 MULTI-OSCILLATOR PHYSICAL MODELLING SYNTHESIZER

Commercial physical modelling synths first appeared in 1994, but until now, nobody has produced one that offers truly multitimbral operation together with decent polyphonic performance. Korg's new Z1 does — and for well under £2000. In this, the first UK review of the finished instrument, GORDON REID laughs wildly and plays lots of chords — because he can.

f you're one of those readers who skim-reads the detail of a review, and then jumps to the conclusion and reads that in depth, please don't. Korg's latest hi-tech keyboard is the world's first multi-model, multitimbral physical modelling synth, and combines great strengths with the odd surprising weakness. It's a fascinating instrument, and it deserves some of your time. So, find somewhere comfortable where you aren't likely to be interrupted, take a deep breath, and join me for a thorough look at the Korg Z1.

THE BASICS

The Z1 is a bit of a hybrid. It lives in the case of Korg's flagship workstation, the Trinity, and incorporates a 61-note keyboard that offers eight modes of aftertouch sensitivity, plus 13 modes of velocity

sensitivity. Like the Trinity, it has effects, but as we shall see, they don't behave like the Trinity's. The heart of the Trinity's user interface, its touch-sensitive screen, has also been replaced on the Z1 by a smaller 240x64 pixel LCD, but in exchange, 23 friendly knobs have sprouted from the Z1's upper panel (including, as on the Prophecy, five assignable Performance Editor knobs below the display). The Trinity's disk drive has also disappeared, but a rectangular touch-sensitive X-Y pad makes its appearance, and this fulfils many of the functions of the Prophecy's Log controller, which the Trinity also lacked.

Round the back, there are less holes than you might expect (more on this point later), with just a stereo pair of audio outs, inputs for volume, damper and two assignable pedals, plus the usual MIDI Ia, Out and Thru sockets. There's also a slot that accepts PCMCIA Flash ROMs and Flash EPROMs. The only other connector, apart from the power socket, is the headphone output located at the front beneath the control wheels.

MODEL TYPES

Like the Prophecy, the Z1 is a physical modelling synth derived from Korg's OASYS (Open Architecture Synthesis System), designed using the Synth-Kit development system (for more on the development and architecture of the Prophecy, take a look at the original preview of the instrument in



SOS May '95, and my subsequent full review in the October issue of the same year). The simplest way to approach the Z1 is to think of it as a 12-voice polyphonic and 6-part multitimbral Prophecy. This is an analogy that survives initial inspection, although it doesn't tell the whole story.

Like a Prophecy patch, a Z1 patch uses a pair of MOSS (Multi-Oscillator Synthesis System) oscillators plus a sub-oscillator and a noise source. Depending upon the type of model you choose to work with, you can hear the conventional outputs of each of these elements, or use the first oscillator and/or the sub-oscillator and/or the noise generator to build sounds within the second oscillator (or vice-versa). However, in addition to the nine model types offered by the Prophecy (the Standard Analogue model; VPM — for which read FM; the Brass model; the Reed model; the Plucked String model; the Comb Filter model; the Sync model; the Ring Modulator model; and the Cross-Modulation model), the Z1 offers four new oscillator models, the additions being the Resonance oscillator, Organ model, Electric Piano model, and Bowed String model. Let's take a look at each of these oscillator models.

STANDARD OSCILLATOR MODEL

The Standard oscillator is the one on which many players will concentrate. This offers sawtooth and

pulse waveforms as the main oscillator outputs but, like some exotic polysynths, also allows you to add a triangle wave or sine wave, each with independent volume controls. You can apply Pulse Width Modulation to the sawtooth, pulse, and triangle waveforms. The mixed output then passes to a 'wave shaper' that further complicates the waveform to create harmonically complex, more interesting sounds.

COMB FILTER & RESONANCE OSCILLATOR MODELS

Still in analogue-emulation mode, we come to the next two oscillator types: the Comb Filter oscillator model and the Resonance oscillator model. A comb filter is so named because it introduces several tightly defined notches into any harmonically rich signal presented to its input, and its transfer function looks like the teeth of a comb. The Comb Filter Oscillator accepts seven different signals at its input (the 'other' MOSS oscillator plus noise; the sub-oscillator plus noise; filter1 plus noise; filter2 plus noise; pulse noise; and an impulse) and, depending upon the characteristics of the filter, the output can vary from simple modulated noise

THOROUGHLY MODERN PAD

As mentioned in my Z1 preview in the August issue, the Z1 has no breath controller input. OK, I recognise that many players can't get the hang of them, but it still seems a strange omission, especially when you consider how many wind instruments the Z1 is designed to emulate. Oh well... I suppose that this is why Yamaha KX5s and Anatek wind controllers exist. For the most part, too, the Z1's X-Y pad is a fine substitute for such a device (and also for the Prophecy's log).

You can assign any two of the Z1's performance parameters to the pad. When playing, you create dynamic effects by moving your finger over the pad, opening filters or performing other complex timbral changes in real time, morphing from one sound to another as the mood takes you. This makes the Z1 more expressive than it would be with just conventional wheels and pedals. You can latch the last position at which you touched the pad, allowing you to return to playing with both hands once you've reached your sonic destination.

The importance of the pad should not be under-estimated. This is because, unlike most other synths, the Z1 not only reproduces notes

with realistic timbres and modulations, but recreates the nuances and sounds that occur within, between, and during the transitions between those notes. Consequently, if you play it with a simple, organ-like technique, its brass, string and reed patches will sound as mechanical as they would on a PCM-based synth. In the absence of a breath controller, this means learning to simultaneously control the X-Y pad, the wheels, the velocity sensitivity, and the pressure sensitivity. It's not easy, but then playing a keyboard well never was.



THE Z1 STRAIGHT OUT OF THE BOX

Take it out, put it up, plug it in, turn it on, and play. It's not the most scientific of approaches, but it's one that can often give a lasting impression of an instrument — that's why manufacturers take such pains to ensure that patch A00 is always a killer sound. So, bearing in mind that many S0S readers will form their hands-on opinions of the Z1 under similar conditions — a quick tootle in a shop with no time to get into the details of editing it — how does the Z1 fare?

My first impression, regardless of the nature of the sounds I selected, was one of class... the Z1 sounded good. Flicking through the two banks of Programs, I soon found a number that turned me on. The first, and one that I later relied upon on I

occasions that I played the Z1 live, was an electric plane that did everything a Fender Rhodes could do, except make my fingers bleed. I also discovered the Clavinet patch that caused me to spout such praise elsewhere in this review.

More surprising, and no less gratifying, were some of the breathy, ethereal patches. I was always a fan of floaty sounds such as the D50's 'Glass Voices', and the sculpted noise spectrums later offered on synths such as the Korg M1 and Ensoniq VFX, so I couldn't fail to be impressed with the Z1's abilities in this area. And, while we're talking vintage digital synths (as opposed to vintage analogue), the FM pianos also leapt out as superb re-creations of the much loved, and now much

hackneyed, originals.

Less immediate (probably because these sounds need more expression and articulation in order to 'sing'), some of the brass, reed and string sounds required more time and acquaintance before I started to appreciate them.

The exceptions to this were a handful of saxophones and muted brass that, thanks to their realistic pitch-bend and response to velocity, immediately sounded more realistic than any PCM-based samploid. Oh yes, and a flute that jumped out at me as soon as I selected it.

There's no question... straight out of the box, the 21 has the sonic power to impress. But if you never delve into its editing system, you'll miss a huge opportunity to sculpt some genuinely impressive sounds of your own. The choice is your.

KORG 71

to bright and complex tonal sounds. The Resonance Oscillator is similar, except that it takes the output from the 'other' MOSS oscillator, or the sub-oscillator, or the noise generator, or filter1 or 2, and feeds them in parallel to four band-pass filters. You can tune each of these filters independently, with individual gains and Qs. Passing noise through them generates a variety of haunting 'glassy' and spectral effects, and a flick through the factory sounds shows that Korg's programmers have found such effects to be this model's greatest attraction.

RING MODULATOR, SYNC, & CROSS MODULATION OSCILLATOR MODELS

The next three models take the output (called, in these cases, the Modulator) from the 'other' MOSS oscillator, or the sub-oscillator, the noise generator, filter 1 or filter 2, and use it to modulate a Carrier generated within the model. The Carrier can itself assume four waveforms with various degrees of brightness and keyboard tracking, and the interactions between the Modulator and the Carrier provide a huge range of timbres, from smooth and melodic to screeching atonal excesses.

The Ring Modulator oscillator model is the first of this family, but it does not emulate analogue ring modulators. These output the sum and difference frequencies of two signals presented to their inputs, often resulting in clangorous, metallic-sounding timbres. In contrast, the Ring Modulation oscillator model multiplies the Modulator and Carrier signals to generate a variety of ring modulation-type effects. The Cross-Modulation oscillator model differs from the previous model only in the mathematics of the interaction between the Carrier and the Modulator. In this case, the Modulator frequency-modulates the Carrier, producing a form of 2-operator FM synthesis, albeit with more modulation options than I care to count. This model generates strong, complex sounds, and is particularly suited to aggressive timbres.

The Sync Modulation oscillator model is the simplest of the Z1's oscillator models. Here, the Modulator re-initialises the Carrier waveform each time it passes '0'. This is classic 'sync' (as found on many analogue instruments) but the effect on the Z1 is more subtle than on '70s synths, and the sounds are generally less aggressive than those obtained from the Ring Modulation and Cross-Modulation oscillator models.

VPM is Korg's implementation of FM synthesis, although in some ways it is closer to Casio's Phase Modulation (as used in their CZ-series of synths) than it is to true FM. There is only one Carrier and one Modulator per oscillator, but this Carrier may assume any one of four waveforms, and it is further 'wave-shaped' before being modulated. I love VPM. The results are recognisably FM in nature, from classic DX7 pianos to bells and DX-style basses, but they lack the background noise from which almost every FM synth suffered so badly.

ORGAN MODEL

The Organ model offers three virtual drawbars per oscillator. Each of these drawbars may assume 16 pitches (of which nine equate to the drawbar footages of a Hammond) and four waveforms: SIN1 is a pure sine wave; SIN2 and SIN3 add the 2nd and 2nd+3rd harmonics respectively, and TRI is a triangle wave. You can add single-trigger and multi-trigger percussion with controllable delay to each drawbar. In a Z1 patch with both MOSS oscillators set to 'Organ', there are sufficient parameters to emulate almost any Hammond registration, but with a more limited amount of control. In particular, there's no way to build the patch so that you can push or pull every possible combination of drawbars.

ELECTRIC PIANO MODEL

The Electric Piano model imitates a range of electric pianos by allowing you to adjust parameters relating to the shape and motion of a virtual hammer, the shape and size of a virtual tine, and the position of a virtual pickup. The results are superb, so I hope that Korg will release a 76-note 'Z1 Pro' or even an 88-note 'Z1 ProX'. If they did, the Fender Rhodes and Wurlitzer Programs would alone justify much of the Z1's price. Furthermore, you don't need two people to carry a Z1, and you don't have to tune it by soldering bits onto — or filing bits off — any tines. There's no contest.

• BRASS & REED MODELS

The Brass model is actually six models — Brass1, Brass2, Brass3, Horn1, Horn2, and ReedBrass which represent various shapes and lengths of bore. Pressure and Character parameters then emulate the action of a player's lip position and tension, the shape and resonant character of the instrument's bell, and the presence of any mutes. The Reed model incorporates no fewer than 17

I HAVE A DREAM...

Well, a couple of wishes, anyway, Firstly, as I've already mentioned in the main text of this review, I hope Korg will produce a 76-note (or even 88-note) version of the Z1, so it's possible to really get the best out of the piano and organ sounds. My second, vaguely related, wish also concerns the Z1's pianos. The best piano sounds ever produced by an electronic instrument came from Roland's SAS instruments, such as the RD1000 and the MKS20. SAS was itself a form of physical modelling, and it would be a lovely bonus if the Z1 could offer a similar equivalent... Maybe in a future upgrade?

	THE EFFECTS	
PRIMARY EFFECT	MODES	SUBSIDIARY EFFECTS
INSERT EFFECTS		
FX1 & FX2 (SIZE 1)		
Distortion	Overdrive/High Gain	4-band EQ
Compressor		2-band EQ
4-band Parametric EQ	Peaking/Shelving	
Wah	Auto-wah/Modulated	
Exciter		2-band EQ
Decimator		4-
Chorus	Clock/Ext sync	2-band EQ
Flanger	Clock/Ext sync	-
Phaser		
Rotary Speaker (1 Rotor)	-	-
Delay (Mono)		
FX1 ONLY (SIZE 2)		
Talking Modulator	A/E/I/O/U	
Multitap Delay	Normal/Cross1/Cross2/Pan1/Pan2	-
Ensemble		-
Rotary Speaker (2-rotor)		-
MASTER EFFECTS		
Stereo Delay	Stereo/Cross feedback	-
Reverb/Room		2-band EQ
Reverb/Hall		2-band EQ

THE SOFT OPTION THE 71

The Z1's editing software comes in two versions: one for 680x0-based Apple Macs and one for Power Macs (plans for a PC version are currently under consideration). The editor also acts as a librarian, allowing you to edit and store any combination of Programs, Multis, Arpeggios, and Global settings, It's obtainable free of charge from Korg's US web site (http://www.korg.com). Those with no web access should be able to obtain a copy from their dealer, but if you have any problems obtaining it this way, contact Korg themselves.

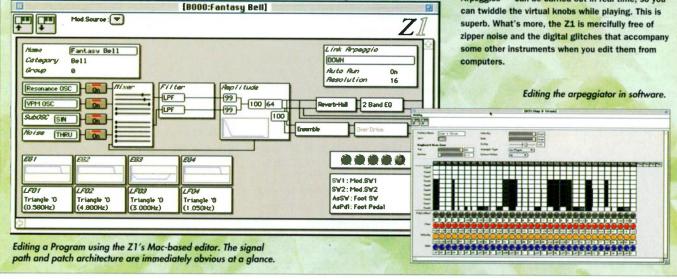
Load the editor or open a library and a window will

show the types of data held within that library. Opening this in turn displays the content of the library, and, if it's a Program dump, a user-specified selection of the programmers' names, the Program types, the user groups to which each patch belongs, the models used, and the arpeggios attached to them. Opening an individual Program or MultiSet reveals an overview of its structure, and clicking on any of the constituent parts - oscillators, filters and so on — displays all the parameters associated with that function (see the screen dumps dotted around this box). There's no more scrolling through multiple

pages of data... everything is visible at a glance. A Program has 23 of these pages, and a MultiSet has 13, but there seems to be no limit on the number that you can open and display simultaneously, which is nice.

The 'Global & MIDI' library offers a further eight subsidiary pages (the Z1 has a superb MIDI specification), but it's the Arpeggio page that wins my 'Best Bit Of Software 1997' award. The page displays every parameter associated with an arpeggio, and all the gate times and flams that can be tricky to program on the LCD become straightforward and obvious.

All editing - whether of Programs, MultiSets, or Arpeggios - can be carried out in real time, so you computers.



sub-models (the Prophecy's offered a 'mere' 13) including a select on of saxophones, double reeds, a bassoon, a clarinet, flutes, harmonicas, and a 'reed-synth'. In both models, the huge range of fundamental tones is further augmented by a noise generator, by a peaking EQ that adds overtones, and by dual pitch-bend characteristics - smooth pitch changes as obtained by varying the bore length on a trombone, or abrupt, as obtained from an instrument of fixed length. The Reed model also offers a high-pass EQ that removes low frequencies to provide a 'lighter'

PLUCKED & BOWED STRING MODELS

The final two models are the most complex. The Plucked String model simulates guitars, basses, Clavinets, harpsichords, and other, less well-known stringed instruments. Its 'plucking' parameters represent the level, attack, and noise associated with the action, and the position at which the string is struck. The strings themselves are defined by their dispersions, damping, reflection characteristics, and the positions of their harmonics. Seven further parameters determine the position and nature of the pick-up that detects the 'vibration'.

As expected, the guitars and basses are rich and authentic, but the real surprise is the even greater authenticity with which this model recreates the sounds of Hohner's classic Clavinets. Having owned and played D6s and E7s for too many years to admit, and having never found a synth that even came close, the Z1's Clavinet patches are a source of sheer delight.

Moving on, the Bowed String model emulates instruments such as violins and 'cellos, allowing

you to define the bowing speed and the pressure with which the bow is dragged across the strings. 'Rosin' increases the friction between the bow and string (enhancing the tonal differences of different speeds and pressures) and damping parameters control the tonal characteristics of virtual 'fingering'. Parameters related to string position and dispersion characteristics imitate the playing of thin or thicker strings, and reflection parameters affect the ease with which notes sound. Finally, a peaking EQ accentuates or attenuates a range of frequencies to emulate various body cavities and sizes (the instrument's, that is, not yours!).

PROGRAMS & MULTIS

So, now you've mastered the Z1? Well, no... all we've described are the models that play a major part in replacing the oscillators on a conventional synth. These are but the first step to creating a patch (which Korg has, in time-honoured fashion, called a Program).

The Z1 uses four sound sources in each Program. The modelled oscillators, OSC1 and OSC2, are the first and second of these and, except for the reed, brass, plucked and bowed string models (which require all the available DSP power for a single oscillator) you may allocate any MOSS model to either of them. The third is the sub-oscillator. This offers sawtooth, square, triangle and sine waveforms, may be freely tuned with respect to OSC1 and OSC2, and can track the keyboard independently from them. The fourth and final Program sound source is the noise generator, which is a white source filtered by a dedicated resonant filter that can assume

THE Z1 AS MONOSYNTH

You can play the Z1 monophonically by setting the key-mode to monophonic, or by allocating just one voice to a Program in a MultiSet. Furthermore, the Z1 offers singletriggering and multi-triggering, each with highest-note, lowest-note, and last-note priorities, so you can set it up to emulate the playing characteristics of any monosynth on the planet. The Z1 also has a switchable, detunable, dynamic, Unison mode that allows you to specify 1, 2, 4 or 6 voices per note, thus offering duophony if required. Alternatively, you can allocate 2-note polyphony within a MultiSet. With its 5-octave keyboard and multiple modes of aftertouch and velocity sensitivity, the Z1 is perhaps the most playable monosynth ever.

KORG Z1

EXTERNAL PATCH STORAGE

If the 256 Program memories prove to be inadequate, you can increase them by adding between two and 16 extra banks on a PCMCIA card. I can't imagine anybody with a 4Mb card (2,304 Program memories) needing any form of external storage. However, I'm a little concerned about the lack of MultiSet memories. An unexpanded Z1 holds 32, and although the largest PCMCIA card expands this number to a comfortable 288, I fear that the basic memory will be inadequate for many users.

AMMI GOVERNMENT OF THE PARTY OF

The Z1's display, with the Prophecy-like Performance Editor knobs below. One of the arpeggio editing screens is visible.

pros & cons KORG Z1 £169 · Power and flexibility coupled with surprising simplicity. · Superb analogue, electric piano, brass, and FM sounds (amongst others...). An expressive selection of controllers. • The Trinity's flagship design and keyboard. • It exudes an indefinable "play me, you know you want to ... " quality. . The limited number of outputs. • The limited effects capabilities. . No breath control input The Z1 is the first of a new breed of polyphonic synthesizers, and a tremendo breakthrough at its price. Despite some peculiar limitations, the Z1 could be the Korg M1 of its generation. OUND ON SOUND

▶ low-pass, high-pass, or band-pass characteristics. You can toggle each Program sound source on and off using four dedicated buttons found alongside the real-time controllers on the Z1's front panel, but, more usefully, you can use the Program's Mixer section to determine the amount that each will contribute to each of Buss 1 and Buss 2, which together make the final sound. The mixer also has a fifth pair of inputs, called Feedback, that allow you to feed the output from the Amplifier section back into the signal chain — though this needs to be used with care, otherwise all your careful programming will result only in distortion.

The mixed signal passes to a Filter Section that offers two multi-mode filters, each of which can assume low-pass, high-pass, band-pass, band-reject, or dual band-pass characteristics. The last of these is interesting because it emulates the formants of a human voice, and imitates the natural resonances of

hollow bodies. You can route the signal through the filters in three ways: parallel, serial1 (in which only Buss 1 is filtered) or serial2 (in which Buss 2 ceases to exist and Buss 1 is tapped both before and after filter1). Sounds complicated? It isn't, because the on-screen graphics make everything clear. Both filters are resonant, will self-oscillate, and their keyboard tracking is variable from -200% to +200%. Note, however, that a self-oscillating digital filter needs to be 'kicked' into life, and selecting a Program with

such settings will result in silence unless you excite the algorithm by playing a note.

The signal next passes to an Amplifier Section that boasts a dedicated 5-stage envelope. But if one envelope appears a little mean, fear not. The dedicated EG Section offers four more of the same. The LFO Section is similarly equipped, with four LFOs, each of which can assume 17 different waveforms (including Sample & Hold). Each LFO may be independently sync'd to incoming MIDI Clock, and roughly 100 sync rates are available.

Other parameters include the scale type, of which there are nine presets and two user-definable scales, and a Random Pitch Intensity parameter that introduces slight pitch instabilities to imitate analogue synthesizers (this is the direct equivalent to Roland's Analogue Feel parameter).

The Z1's effects section is made up of two Insert Effects (the imaginatively named Effect 1 and Effect 2), a Master Effects section (reverb and delay) and a simple 2-band Master EQ, and these different sections lie in series on the stereo buss. In other words, everything passes through both effects; there's no assigning Effect 1 to one oscillator and Effect 2 to another, for example (more on this later). The two virtual Insert Effects units can each host one of the 15 Insert Effects, but DSP limitations mean that only Effect 1 can make use of all of the Insert Effects,

while Effect 2 is constrained to the simpler algorithms. This brings me to one of my Z1 moans. The Korg Trinity grades its effects by size (1, 2 or 4 — a measure of the amount of DSP processing power each effect takes up) and allows you to select any of these up to a total size of four (eight in a multitimbral Combi). The Prophecy allows you to use six 'size 1' effects simultaneously — although the Prophecy manual doesn't actually use the term size. Nor does the Z1 manual, but doing a straight comparison of effect types from Trinity to Z1, I concluded that the total 'size' of the Z1's Insert Effects section is two; so, for example, you can't program an overdrive followed by a twin-channel Leslie simulation, or chorus with multitap delay. Furthermore, the integrated modulators within the Insert Effects can't be synchronised with the main LFOs. But otherwise, and within these limitations, the Z1's effects are adequate.

You can assign the wheels, pad, switches and pedals to modulate various parameters. Furthermore, the five knobs in the Performance Editor section on the top panel can each control up to four parameters drawn from a list of 439 Program parameters, with the range and response curve independently specified for each. Any changes made using these knobs, even during live performance, can be saved as if they were full edits. Finally, while we're on the subject of controllers, these can be software re-calibrated by the user. I've rarely seen this facility before (the Synclavier II has it) but it ensures that, in the absence of a major fault, different Z1s can always be calibrated to respond as you expect.

Once you've finished programming your, um... Program, you can allocate it to one of 18 Categories and 16 User Groups, and save it to any of the 256 memories arranged as two banks of 128 (see also the 'External Patch Storage' box). You can also combine up to six Programs, with individual note ranges, independent MIDI velocity ranges, and separate MIDI channels, into a multitimbral 'MultiSet'. Each Program can be assigned a different pitch and a different scale to its siblings, and their responses to MIDI controllers can also be defined. although only one Program can respond at any given time to the Z1's performance controls and editors. Effects can also be applied to a MultiSet, and this brings me to my second moan. In my Z1 preview two issues ago, I stated that the Z1's effects were multitimbral, as on the Trinity. It seems I was wrong, which is a real shame. A MultiSet's effects buss is identical to a Program's: in other words, it's a single stereo buss onto which two Insert effects, a Master effect, and an EQ are hung, and your entire MultiSet passes through all of this in series; there's no assigning of individual effects to individual Programs in the MultiSet.

While on the subject of patch architecture, I was slightly bothered by the speed (or, rather, the lack of it) at which the Z1 changes between Programs and between Multis. I suspect that, like some other DSP-based devices, the Z1 generates a deafening digital click when on-chip parameters are re-initialised, so Korg has muted the outputs during a voice change. If you need to switch sounds while

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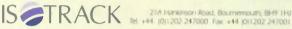
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KORG Z1

THE ARPEGGIATOR

Arpeggiators were important elements in serious synthesizers back in analogue days, but somewhere along the line, they fell out of fashion. That's no longer the case, and many modern DSP-based synths offer an arpeggiator. But these tend to be monophonic, so the Z1's polyphonic arpeggiator is significantly superior to its competitors'.

On the Z1, 20 arpeggio patterns are available at any given time, of which five are preset, and 15 are user-programmable. The preset shapes conform to the standard up, down, alternating and random patterns, and can cover one, two, three or four octaves. You can specify the MIDI velocity for each note, the gate time, and whether notes are sorted or arpeggiated in the order in which you played them. Furthermore, you can set the speed relative to the internal or an external clock, and the arpeggiator will also function as a MIDI master clock.

User Patterns allow you to specify the number of

notes that the arpeggio will simultaneously interpret (up to a maximum of 10) plus the pitch offset, velocity, and the gate time for each. If you play more than one note on any given step, a flam parameter allows you to 'strum' chords if desired, and you can specify positive and negative values to select between 'up' and 'down' motions. With short gate times on some steps (to 'choke' notes), a sensible choice of velocities, and a good guitar patch, the results can be magic.

You can modify Programs in real-time while an arpeggio is playing, and this is excellent for fine-tuning sounds. The same facility will also appeal to dancers, trancers and clubbers, for whom knob-twiddling during repetitive sequences is essential. Indeed, you can create complete techno/trance rhythms by sequencing heavily filtered sounds and modulating the resonance so that low notes give an acid 'whump' while higher notes play the harmonic content. All this, using just one sound!

playing live, make sure that you have a couple of seconds to do so, because that's how long it takes.

EDITING

Without the large display and touch-sensitive interface offered by the Trinity, editing the Z1 could be a daunting task, especially since Korg have chosen not to give every parameter its own slider (as on the Roland JP8000) or its own knob (as on the Clavia Nord Lead). But that decision is hardly surprising — if they had attempted to do so, the top panel of the Z1 would have been the size of Wembley Stadium. So Korg have reached a compromise, by employing a two-tiered editing system. (I always said that it would end in tiers!)

If you want to make simple edits in real time, 14 dedicated controls (known as the Real-Time Controllers) make Minimoog-esque editing simple and immediate. But if you want to get into serious sound synthesis, you need to burrow into Korg's new software interface. This, while not as marvellous as that employed by the Trinity, is decidedly superior to those employed by the Prophecy or any of Korg's other workstations. It works like this. You decide which aspect of the sound you wish to change, then press the appropriate button to access the right section within the programming system. Each section offers multiple pages that you can step through using the Page Left/Right buttons, and you can move between related parameters by pressing in one of the five Performance Editor knobs found below the screen. Once you have selected your parameter you *turn* the knob (or, if you prefer, use the cursor up/down buttons or enter the desired value using the numeric keypad) to make your edit. A range of graphics guide your decisions and, for many parameters, these show exactly what's happening whenever you have a twiddle.

If all this sounds a bit much for a few knobs and an LCD to handle, you can avail yourself of the excellent software editor that comes with the Z1 (see 'The Soft Option' box elsewhere in this article).

For all its power and seeming complexity, and its apparent desire to be all things to all players, the Z1 is easy to understand and use. Indeed, with fewer Program options than a Prophecy, and a better editing system, it's a programmer's delight. But don't let this penetrability fool you... the Z1 still offers more sound creation possibilities than are dreamed of in your philosophy, Horatio. There are, for example, 49 modulation sources that you can route to several squillion destinations, and most of the parameters within the modulation sources can themselves be modulated by any of the other modulation sources. With so much power at your fingertips, you'll be staggered that you can programme anything meaningful at all!

RESERVATIONS

There are a couple of areas, as I hinted at the start of this review, where I feel the design of the Z1 disappoints. Some of these are minor points that I've already dealt with, but there are a couple of others. Firstly, the 12-voice polyphony. "But this is the first commercially available physical modelling instrument to offer so many voices," you cry. That's absolutely true; other modelling synths such as the Roland JP8000 and Yamaha AN1x offer only eight or 10 voices — but then these are only bi-timbral, and don't offer piano and organ models, where you really need the extra notes, so the comparison is not valid. Fortunately, Korg's DSPB-Z1 expansion board increases the Z1's polyphony to 18 voices, making pianos, organs, and MultiSets much more usable.

The DI-TRI digital interface board is another upgrade that will soon be available. This adds a 48kHz wordclock input and an ADAT-compatible digital output to the Z1, and it is this that brings me to my other major concern — the number of audio outputs.

A single pair of audio outputs is spartan provision for a 6-part multitimbral synth and, contrary to expectations, the optional ADAT optical interface, although theoretically capable of providing up to eight channels of digital audio output, doesn't provide a remedy for this. The DI-TRI only addresses four of the eight ADAT channels, and those are derived from the stereo buss. Channels 1 and 2 are tapped after the effects, and channels 3 and 4 are tapped before them; so you have no more control over your sounds' destinations than if you used the analogue outputs. This criticism would be ameliorated if the

Z1 FEATURES

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Z1's effects were multitimbral, but as already mentioned, they are not. Programs in MultiSets are mixed before the Insert Effects; so if your guitars are flanged (nice!), your Hammond organs are flanged too (not nice!). I'm surprised at this, and can't understand why Korg have done it. The Z1's basic voicing and editing features are superb, but the ancillary features are more limited than the other features would lead you to expect.

However, let's not get carried away. A Minimoog has limited envelopes and no memories, neither a Prophet 5 nor a Memorymoog are velocity- or aftertouch-sensitive, and a Mellotron can only sustain a note for eight seconds. Yet we don't stand them against a wall and shoot them for crimes against synthesis. On the contrary, we revere them, because the sounds that they produce, the music that they inspire, transcends their technical limitations.

Furthermore, you have to consider what else is available in the Z1's league. You may like the sliders of the Roland JP8000, the knobs of the Clavia Nord Lead, or the colour of the Yamaha AN1x, but the JP8000 and AN1x are merely bi-timbral, have lesser polyphony, also sport just two outputs, and have effects sections far more limited than the Z1's. They offer just one (analogue) model, and they are far less flexible or controllable than the Z1. The Nord Lead 2 (reviewed in last month's SOS) is better in this respect, with 4-part multitimbrality and four outputs, but, like the Roland and Yamaha, it will only imitate analogue synths. Furthermore, these instruments have 4-octave keyboards, so you'd never use them for complex piano or organ passages in the first place.

CONCLUSION

You could read sections of this review and conclude that I have come down hard on the Z1, but that would be a mistake. In the context of its competitors, it is well-specified, and great value. Indeed, its analogue models alone justify much of its price, and if it had a 76-note or 88-note keyboard, it would be the world's best synthesized electric piano (see the 'I Have A Dream' box).

Most importantly, the Z1 passes the essential test: it makes me want to play. With Korg's permission, I took the pre-release unit on the road, leaving both my Trinity Pro and my Wavestation at home. It was a tough test but, with the exception of a bug in the aftertouch software (which Korg assure me has already been put to rights by means of a swift software update), my Z1 came through with flying colours. The electric pianos and lead synth sounds were superb, and the Clavinet sounded as if I had a Hohner D6 tucked away out of sight; what I want (what I really, really want) is to carry on using them. Despite its one or two surprising design features, the Z1 is a remarkable instrument, and deserves every success.

Z1 £1699; DSPB-Z1 6-voice expansion board £399 (to be confirmed); DI-TRI 8-channel optical ADAT interface £109. Prices include VAT. Korg UK, 9 Newmarket Court, Kingston,

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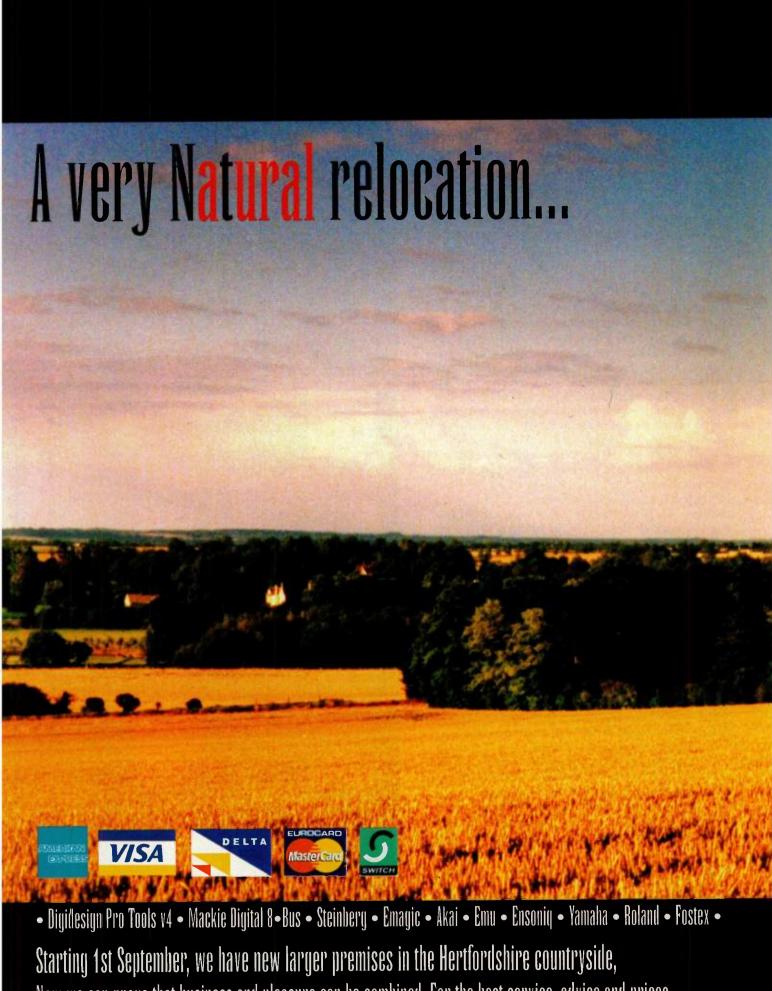
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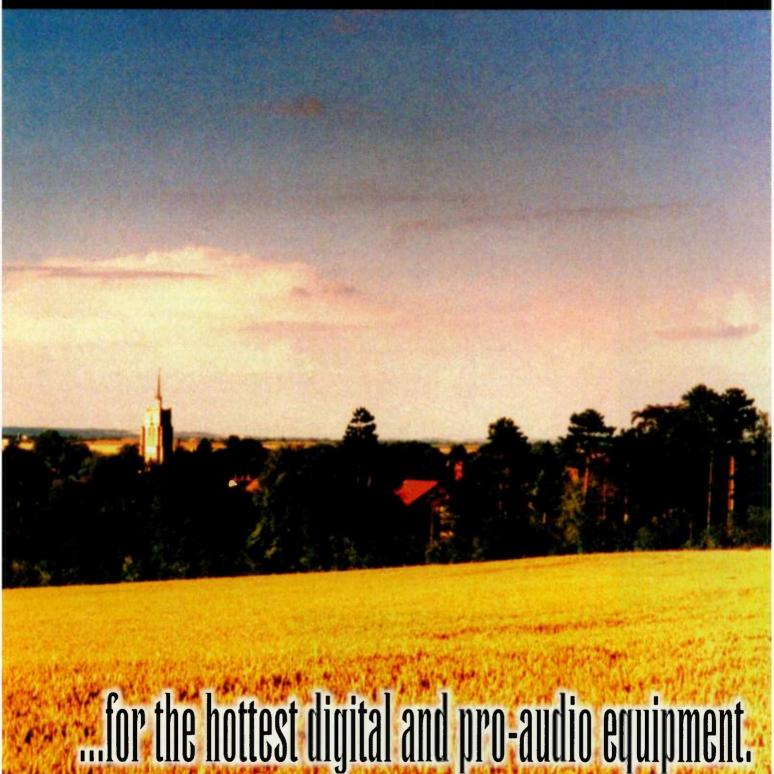




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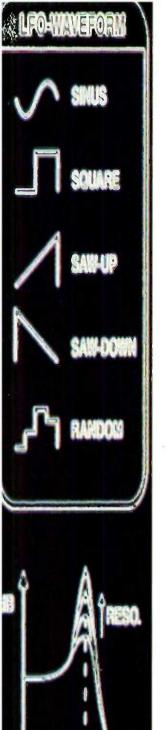
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PART 4: ADDITIVE SYNTHESIS

Throughout the '80s, additive synthesis was the Holy Grail for synth purists; many machines aspired to it, but only one achieved it successfully. PAUL WIFFEN explains how additive works and looks at the various implementations, including the newly updated Kawai version.

n previous instalments of this feature, I've used various analogies from the visual arts to help illustrate how different types of sound generation work. Analogue or subtractive synthesis I likened to sculpture, where artists starts with more 'stuff' than they ultimately need and remove large chunks of it until they are left with what they actually want. Sampling is more like photography, with a snapshot of the required timbre being taken; in PCM-based machines (often known as sample + synthesis) that snapshot is tweaked for the final result in much the same way that a photograph is manipulated during development and printing. It can be altered a little, but it will always be a photograph of the same subject.

To continue in this vein, additive methods of synthesis are closest to the oldest of the visual arts, painting. The sound is built up from its constituent parts, just as a painter mixes together different hues to achieve the required colour, and then lots of

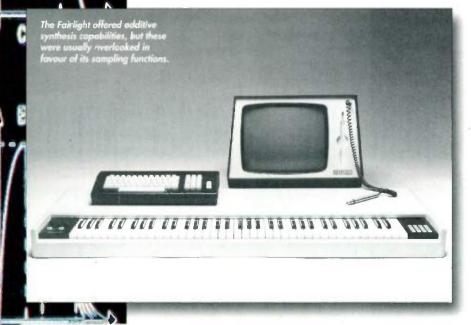
different colours are used to create the final picture. Additive synthesis uses combinations of harmonics to create the basic tone colours or 'timbres' and on more sophisticated systems several of these timbres can be combined to make the overall sound. On later additive synths it's not uncommon to find filters, borrowed from subtractive synthesis (just as you find them on many PCM-based machines), used to highlight the unique harmonic content of the waveforms that additive can create.

ALL-ARTIFICIAL ADDITIVES

When we looked at the basic waveforms used in subtractive synthesis (see SOS June '97), we found that certain common electronically generated waveshapes - square, sawtooth, sine, and so on could be described in terms of their harmonic content. A sawtooth contains all harmonics in inverse proportion to their number, a square wave all the odd harmonics in the same ratio, a sine wave only the fundamental or first harmonic. Additive synthesis turns this arrangement on its head and uses those very harmonics as the building blocks for much more complex waveforms. Where realtime timbral changes are possible, these are achieved by varying the levels of individual harmonics or groups of harmonics, often using devices we have come across before, such as envelopes and LFOs.

Because the sine wave is the purest waveform, in that it only contains the fundamental, and because it is the easiest to generate electronically, being very simple to describe mathematically, the sine wave is used as the basic building block of additive synthesis. A whole series of sine waves (whose frequencies are related to each other in exact correspondence with the harmonic series we used to analyse analogue waveforms previously) are 'summed', or mixed together. The second sine wave is double the frequency of the first, the third three times that of the fundamental, and so on. This makes it very easy to know the frequency of the harmonic in relation to the fundamental - for example, if your fundamental is good ol' A440, then the frequency of its fifth harmonic is 2200Hz.

One of the measures of power in an additive synth is how many harmonics are available per note of polyphony. Although in natural and synthesized sound the greater proportion of the harmonics present are the lower ones, if the upper harmonics (normally only present in very small amounts) are not there at all, a the sound is perceived as dull or distant, because distance and obstacles remove the higher frequencies first. This is why, when that flash car masquerading as a mobile disco pulls up next to you at the lights, all you can hear through your closed windows is the bottom end of whatever dubious taste in music the occupant has decided to



share with you. Open your windows and the full glory of the unvarying hi-hat pattern becomes clear.

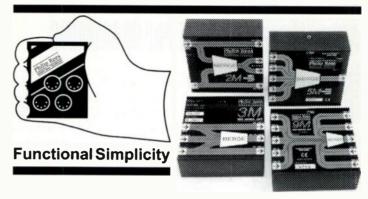
So, in order to create bright, interesting sounds, an additive synthesizer must be able to produce more than just the lower harmonics. This is particularly true in the lower ranges, where more and more of the harmonics of a sound are brought down into the audio spectrum. On higher fundamental frequencies, the higher harmonics quickly move into ranges which can only be appreciated by dogs.

Any self-respecting additive synth should be able to manage a minimum of 32 harmonics. Any less and the proper term for it is 'an organ'. In fact, strictly speaking, the tonewheel organ is the first additive synthesizer, allowing you to mix ten or more sine waves at related harmonic frequencies via the drawbars. Of course, if the tonewheels are creating pure sine waves, the sound will be very thin and uninteresting. Those organs which tend to sound the most pleasing to the ear are those where, through age or deliberate design, the tonewheels are putting out more complex waveforms, augmented by percussion, overdrive and a rotary speaker. Ten sine waves on their own (whatever unique mix of levels you come up with) do not a full sound make. In fact, 32 harmonics is an absolute minimum, and many additive synths provide 64. On the really well-specified machines, it is often possible to go to 128 by halving polyphony (ie. the second voice is used to create harmonics 65-128).

It's an interesting exercise (and proof that the theory I have been spouting is based in fact) to use additive synthesis to recreate the standard waveform timbres of analogue synths (although if this is all you ever plan to do with additive you will be drastically under-using its potential and should give up now!). By setting the second harmonic to half the level of the first, the third to a third of the level, the fourth to a quarter, and so on up the series, you will soon hear the familiar timbre of the sawtooth wave emerging as if a filter were being opened up slowly on it. In fact, as long as you're able to set the levels precisely enough, this will probably give you a more accurate sawtooth than most analogue synths. If you don't recognise the sawtooth timbre from your analogue synth, it's probably because the synth is only producing an approximation, with a bunch of extra frequencies not technically supposed to be present adding the extra character (just like the more interesting organs I referred to earlier).

Herein lies an early warning of one of the main dangers of additive synthesis. Without care it can sound weak and thin, and on simple implementations the best you can hope for is some pure tones with a glass-like transparency. If you're looking to additive for rip-roaring sounds which cut through everything else and grab the ear, you'd better make sure that your additive synth offers enough complexity and real-time operation to vary the harmonic content enough to demand the ear's attention (or that it 'cheats' by adding subtractive filters or PCM snippets to its sonic arsenal). I actually think there's little point in additive synthesis if you're going to stick to imitations of waveforms which are produced in analogue synths, or — worse still — attempt to recreate 'real' sounds. Having said this, theoretically speaking, any sound can be broken down into its constituent sine waves and therefore could be recreated by a sufficiently powerful additive synth. This theory was often advanced by many of the hobbit-like academics who lurked in the aisles of smaller stands at '80s trade shows, waiting to ensnare innocent journalists who weren't forewarned by previous encounters of this type. The real problem was that, after expounding half an hour of theory along these lines, when you finally persuaded them to play you a sound from this system of theirs (which was going to change the history of synthesis forever), it was always the same thin-sounding pipe organ patch they came up with (hardly surprising, since the pipe organ was the first additive system).

On many of the computer music systems of the early '80s which offered multiple methods of sound generation, additive synthesis was the poor relation, the 'also ran'. The Fairlight had its



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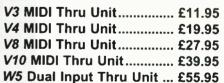
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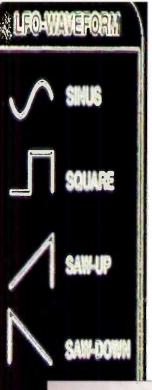
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SYNTH PROGRAMMING

➤ sampling, the PPG its wavetables, the Synclavier its . FM, and these were the glamorous aspects of these machines. They all also had some form of additive capability, yet somehow this was rarely mentioned, and used even less often. There were two reasons for this. The first was that the other means of sound production offered by a given system was more or less unique to the system (in the early days, at least) and therefore its promoters would always emphasise that side. Secondly, the other ways of working offered far more in terms of instant gratification than the additive side, which suffered from what I always refer to as the 'Compute' syndrome.

STONE-AGE ADDITIVE

Early implementations of additive synthesis were not real-time implementations. The actual computational power in these computer music systems was pretty

puny by today's standards (the current average PC with a soundcard outstrips the sonic potential of the original Fairlight by several powers of 10). As a result, they couldn't perform the level changes you might make to different harmonic components in real time, but had to go off-line to compute the new waveform. So, when adjusting the relative levels of the harmonics, you would be flying blind in terms of what the result would be. Actually, deaf is probably a better term than blind, as most of these systems had some pretty fancy graphics to show you what you were doing; my favourite was the PPG Waveterm, which superimposed the waveforms for new harmonics on top of the current waveform, complete with amplitude representation of level. Then, when you pressed 'Compute', it merged these together (eventually) into a single new waveform. However, no matter how pretty these displays were, unless you were very experienced they told you little about how the final product would sound. As a result, the process of creating an additive waveform could be very long-winded, unless you just went for the serendipitous approach of bunging in a load of harmonics with random levels, pressing Compute and hoping for a gem sooner or later.

But the amount of time taken by these early systems to create an additive waveform wasn't the only drawback. Because they were computed rather than generated in real time, these waveforms were set in stone when it came to playing them back. In fact, they were just like samples — indeed, the additive waveform the Fairlight created was loaded into the sample RAM for playback, in exactly the same way as a sample. Even when you used a merge facility to move from one additive waveshape to another, the result was still a fixed calculated product and the speed of the transition would increase as you went up the keyboard and decrease as you descended. When



CURRENT ADDITIVE POSSIBILITIES

Until late last year (that is, when Kawai re-entered the additive arena with a totally updated additive synth, the K5000W, which I had the pleasure of reviewing in January's SOS), it looked as though the Kawai K5 might be the final full stop in the history of additive. You should refer to the K5000W review if you want precise details of how Kawai have used the extra processing power available in the late '90s to update their concept, but let me just broadly cover how the additive synth's potential has been expanded by the K5000 series:

- There are now individual envelopes for each of the 64 harmonics.
- The formant filter has 128 bands (adjusted on a semitone rather than an octave basis) and can be swept using the LFO or envelope.
- The more standard filters now allow high- or low-pass configuration.
- Envelopes can now be looped to cycle complex harmonic changes.
- It is now possible to morph between harmonic snapshots in real time (an updated version of the old Merge capability on the Fairlight, which was so interesting but unfulfilling because it was frozen

into a sample format)

 The last m or addition is the ability to add DSP effects to the sounds, something no modern synth can afford to be without.

Since looking at the K5000W, which featured some other facilities in the auto-accompaniment vein which I felt were of peripheral interest to synth aficionados, my excitement at Kawai's development of the additive strain has further increased with the release of the K5000S and K5000R. These two units forgo auto-accompaniment in favour of the real added value of an arpeggiator and - joy of joys - hard-wired and assignable knobs for real-time manual performance parameter control. Having a dedicated knob to tweak the balance between Odd and Even Harmonics, adjust the Low and High Harmonics, move the Bias (centre frequency) and LFO speed and amount of the Formant Filter, not to mention the Cutoff and Resonance of the standard Filter and the main envelope parameters is, for me, the icing on the cake that Kawai have been baking for ten years now. Those of a more scientific frame of mind will appreciate the ability to assign the four user knobs to the parameters of their choice, and additive sounds are ideal for triggering from an arpeggiator.



Kawai's K5000R & K5000S.

If this article has whetted your appetite for the (largely) unexplored area of additive synthesis, you can do no better than to get your hands on the K5000S or R for experimentation. If this exceeds your budget, a second-hand K5 will give you an excellent start (especially if you can track down the Dr. T's editor to go with it).

Thanks to Arbiter Music Technology for the loan of a Kawai K5000S for the purposes of this article.

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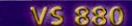


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SYNTH PROGRAMMING

an additive capability was provided really cheaply by Digidesign's *Turbosynth* software for the Mac and Atari, the same restrictions applied. The resulting sound could only really be played effectively by MIDI sample-dumping it across to a sampler, with all the restrictions that implies. Of all the first generation of additive-capable systems, the sounds generated on the PPG Waveterm were probably the most useful, as they could be played back with real-time movement between different waveshapes in the wavetable (if you had the time to create several and then compute the transitions between them) or analogue filtering (if you didn't).

I'm proud to say that the first commercially available synth with the capability to alter additive waveforms in real time was British, and the present author had the honour (if not the financial reward, for there never was any) of being the midwife at the birth. The OSCar, which was mentioned in a previous instalment of this series for the flexibility of its filtering system, also had the capability to generate new waveforms using additive principles. What was unique at the time was that you could actually hear the harmonics being added or removed in real time. I vaguely remember saying to Chris Huggett, during the OSCar gestation period, that if he was going to put



Technos' additive Axcel, complete with touch-sensitive user interface (above).

artists used it unadorned as intros to tracks. You can hear a clear example of this on Jarre's *Revolutions* (perhaps the most OSCar-intensive album ever made, although Ultravox's *Lament* comes a close second and their 'Love's Great Adventure' takes the award for most OSCar-laden single).

Unfortunately, this real-time change in harmonics during waveform creation could not be reproduced during playback, but two waveforms created like this could be played back at once, and then mixed or filtered to create real-time timbral change. I always found the mixture of an additive waveform with a conventional analogue one to be most useful in imparting a little bite and unique character to the traditional analogue synth sound.

Other real-time additive implementations started to appear, mainly from the realms of academe, and they were usually lamentable both in terms of sound quality and of playability - not to mention the poor appearance and hygiene of the member of the design team who had been let out of the lab to do the demo at the trade show where they were previewing. Mercifully, very few of these systems made it to commercial release, but one of the few that did (and proved to be one of the more successful implementations) was the Technos Axcel shown above. Of French-Canadian origins, it had a splendid multi-LED touch-sensitive user interface which made it possible to draw harmonic levels, waveforms and envelopes with a single sweep of the hand. This made it terrifically easy to use but also horrendously expensive (probably the main factor in its short life — a little over a year of intermittent commercial availability).

It also had the capability to load a sample, analyse it and produce an approximation to it built up from sine waves. While this was not very close in terms of fidelity, it made a great starting point for new sound creation (another of additive's traditional drawbacks is the amount of time it takes you to set all the harmonic levels and envelopes to get an interesting sound going — this made for a great shortcut).

additive capability on the OSCar, it had better be more usable than on other machines I had tried. I had clearly been traumatised by my singular lack of success in coaxing something interesting in the additive vein out of Oxford University Music Department's Fairlight on my sole encounter with it, making a mockery of the lengths of bribery and corruption I had gone to in order to gain access to it.

The OSC Oscar sported the first

real-time additive synthesis system.

Although the system Chris came up with for defining the mix of harmonics was perhaps a little unscientific (each key on the keyboard represented a harmonic, and pressing it repeatedly in additive waveform creation mode increased its proportion in the overall result), it was fairly intuitive and gave you real-time feedback. If you didn't like the immediate change in timbre when you added a new harmonic in, you could just take it out again, without all that tedious mucking about with computing. The actual process of building up a waveform was so pleasing to the ear (as harmonics came and went) that several



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SYNTH PROGRAMMING *DHG 1* MOD=ON 1 PIANO 98 HARM INT ENU MOD 99 RANGE= 2-63 ANGLE=0 ALL=1Y ODD=1Y EUN=2Y OCT=3Y 5TH=4Y Figure 1: Setting the relative levels of harmonics on the K5. However, the Axcel's main strength was that it could > set the amplitude envelope separately for each harmonic (or vary the level from other controllers), so you could get really interesting timbral changes in a sound in real time, and in this respect it pointed the way forward. The Axcel's weakness was that the more harmonics you used (ie. the more complex the sound), the more polyphony suffered (the best sounds were monophonic or duophonic), and this, coupled with its high price, led to its early extinction. THE LAND OF THE RISING SYNTH

Kawai's groundbreaking K5.

It fell almost inevitably to Japan to produce the first implementation of additive synthesis which was both real-time and affordable without sacrificing polyphony. The Kawai K5, when I first came across it in 1987, was a revelation, and its sound and facilities still stand up pretty well today. Offering 8-note polyphony (only the DX series had ever offered more at the time), it nevertheless managed up to 64 harmonics per note (128 if you used two notes per voice) and, most important of all. real-time control of the levels of various harmonic groupings. I fell in love with it for its speed and flexibility, and for the fact that I had always known that there must be something in this additive synthesis business -- I just hadn't managed to find it until then. If you can find one of these wonderful machines on the second-hand market (it also came

in rackmount form as the K5M), it's well worth the

paltry sum you will probably have to pay to make it yours. It makes a fine introduction to additive synthesis and is only bettered by Kawai's current K5000 range.

Also worth looking out for is the Dr T's Atari program which took Akai S900 samples and analysed them, for subsequent downloading, via MIDI, into the K5 as additive impressions. First seen on the Axcel, this capability would never fool anything but the most untrained ear, but it made for excellent sounds and a great starting point for new sound development.

Let's look at how the K5 allowed the individual level of harmonics to be controlled in real time, as this synth is one of the best models for successful additive synthesis (and one Kawai have expanded on in the K5000 series). As I mentioned earlier, one of the drawbacks of additive synthesis can be how long it takes to make a sound, simply because of the sheer number of parameters that needs to be set. There's the starting volume level of each harmonic. to begin with (in the earlier non-real-time systems, this was all you could do, because, having been computed, those levels then couldn't be changed). Just setting the level of each of 64 harmonics could take 20 minutes (more if you decided you didn't like the original level you had set). The K5 cut out a lot of the donkey work, by first showing you all harmonics at once, with a bar representing the level of each in the LCD display (Figure 1) and then allowing you to select groups of harmonics whose values could be adjusted simultaneously. These groupings include Odd, Even, Octaves (2, 4, 8, 16, and so on) or 5th intervals (3, 6, 12, 24, and so on) or a user-definable Range specifying the lowest and highest harmonics you want to affect. Once these are selected, turning the increment dial raises or lowers the level of those harmonics in proportion. This may seem simple enough, but before the K5, no-one had streamlined the process to this extent. The Axcel's touch-sensitive interface made it guick to set the levels individually, but grouping harmonics was Kawai's innovation.

Of course, this is only the beginning of making an additive sound on the K5. To actually change the

harmonic levels over time, we return to our old friend the envelope. It would have been possible to make do with the traditional ADSR-type envelope, but Kawai opted for the more flexible rate/level style, with six stages, and the settings of these rates and levels are all visible at once (see Figure 2 on page 218), which saves flipping between screens all the time. Each harmonic (or group of harmonics) can be assigned to one of the four envelopes. There are even short-cuts for the programming of these envelopes, to speed up the process of setting them up. Higher-numbered envelopes can 'shadow' or take on the settings of the lowernumbered envelopes. So you can set up the first envelope and then tweak the higher-numbered ones using the settings

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Figure 2: The K5's 6-stage rate/level envelopes.

▶ of the first envelope as your starting point, rather than having to do each one from scratch.

In addition to the four harmonic level envelopes, there are three more: one for the overall level of the sound, one for its pitch, and one for the filter. To the additive purist, this last word is probably the equivalent of blasphemy, but Kawai realised that sometimes there is just no substitute for the sheer speed of using a filter. Having said that, the filter is a

very accurate digital one, with a unique set of parameters to control it. In addition to the normal cutoff frequency, the point around which the filter operates, you can specify the 'flat level' (ie. the amount of signal that is passed below the cutoff frequency—see Figure 3). By reducing this to zero you can acheive the same sort of result as a band-pass filter; with it set to maximum you get a normal filter response without resonance; and in between, the frequencies immediately

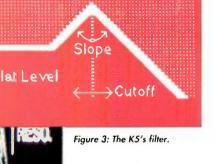
around the cutoff are passed at a higher level (very similar to the effect of resonance). The final parameter, Slope, actually gives a degree of control over how steep the transition is between the cutoff frequency point and the flat level. This is equivalent to changing the number of poles in an analogue filter (ie. increasing the dB/octave cut), and at very steep settings gives a similar result to high resonance settings.

Not content with that filter, Kawai also added a digital formant filter, which works on 11 bands set an octave apart. Although a full examination of formant filtering is really a subject for a future Synth School, the effect of this filter is very similar to that of a graphic equaliser, where the amount by which each octave of frequency range is boosted can be independently set (see Figure 4). This dovetails very nicely with additive synthesis, because the harmonics are also related to the octaves above the fundamental — so you know, for example, that boosting the third octave will affect the harmonics centered around number 8 (if you play the lowest C). Kawai rounded off their real-time implementation of additive by making sure that it was not only the envelopes which could affect the harmonic levels, but also parameters such as keyboard scaling (see Figure 5) and velocity, giving additive an expressive feel for the first time ever.

ADDING IT ALL UP

Reading this piece might leave you with the impression that you're actually in the middle of a review (or a eulogy) of Kawai synths. But to talk about additive synthesis without mentioning Kawai would be like covering FM without reference to Yamaha, or analogue synthesis without Bob Moog. Yes, other people made FM synths, and analogue synthesis existed before Bob came along, but the DX7 and the Minimoog produced the most cost-effective and manageable versions of those types of synthesis, and for me the K5 is in the same league. It took a previously interesting but unwieldy type of synthesis and made it available in a form that was quick and easy to use. Sadly, no other manufacturer has picked up this ball and run with it. For 10 years the K5 has really been the only additive synth to sell in any quantity, and only Kawai's recent re-investigation of the concept has saved additive synthesis from being consigned to the history books (see 'Current Additive Possibilities' box).

The great thing about additive synthesis is that, unlike many of the other methods we have covered in these Synth School pieces, it has not been done to death. It is perhaps one of the most flexible types of synthesis, and is particularly well suited to the creation of abstract sounds rather than imitative ones. In terms of its usage in commercial music, the surface of what additive can do has hardly been scratched, and now that there is a new generation of additive synthesis on the market, I'm optimistic that we may see a revival in its fortunes. If you're looking to add a bit of originality to your music, whatever the style, additive will enable you to depart from the fixed sounds of PCM and the well-trodden timbres of analogue. You certainly won't exhaust its potential in a hurry.



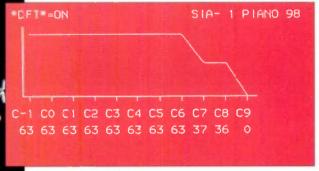


Figure 4: Setting the levels of the K5's octaves relative to one another.

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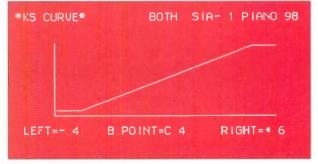


Figure 5: The K5's keyboard sensitivity curve.

Take A Look Inside The

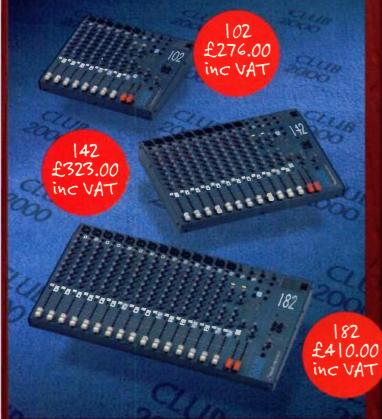
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DIG III: The S/PDIF digital interface supports stereo signals with up to 24bit resolution - on both input and output - so it's ideal for mastering or maybe even a digital effects loop. Whatever the application, your audio tracks are handled with 24-bit precision throughout Layla's internal audio path.

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JAKKO JAKSZYK • THE ROAD TO BALLINA

Guitarist/composer Michael 'Jakko'
Jakszyk has enjoyed an unpredictable
musical career, comprising
near-bankruptcy, fame and fortune
with Level 42, and some disastrous
but entertaining skirmishes with
record companies. Here, he talks to
DAVE STEWART about the making of
his unique autobiographical CD The
Road to Ballina.

n the mid-'70s, Jakko Jakszyk (pronounced 'Jack-check') was guitarist and vocalist with the eccentric UK jazz-rock combo 64 Spxons, before embarking on a slow-burning solo career in 1980. Having recorded three excellent albums of original material, Jakko suffered the frustration of seeing all three go unreleased when no hit single was forthcoming. Throughout the '80s, Jakko 'supplemented his income' by taking the odd acting job until things improved towards the end of the decade, when he participated in a number of album projects (including the Zappa-esque *Big Fish Popcorn*, Sam Brown's big hit 'Stop' and the critically acclaimed *Dizrhythmia*), and signed a publishing deal. Production work also began to flow.

Sensing that things were on the up, the Inland Revenue stepped in. With most of his savings lost overnight in the stock market crash, Jakko found himself staring bankruptcy in the face, and only a last minute (and totally unexpected) phone call from Level 42's Mark King saved the day. Since that dramatic turnaround, the turbulence has subsided, and Jakko has been happily dividing his time between composing TV soundtracks, notably for Lenny Henry's Chef series. and working on solo projects. One of these began as an autobiographical BBC radio program about Jakko's troubled family history, and ended up as a selfproduced CD, The Road To Ballina, which combines speech and music. Seated in the mid-tech chaos of his home studio Silesia Sound, Jakko himself takes up the story with his habitual air of puzzled amusement.

MORE ORPHAN THAN NOT

Jakko: "I grew up in Croxley Green, Hertfordshire, not knowing who my real parents were. My adopted mum was French, and her husband, Norbert Jakszyk, was Polish. They both left their native countries after the war, met each other in England and married, and when they couldn't have their own children, they adopted me. There was a lot of confusion — English was second language for both of them, so although I could understand them both, they often couldn't understand each other — it led to all sorts of daft misunderstandings and rows."

When did you become interested in discovering your real parents' identities?

"Back in 1977, when I was 18. I was talking about it with a friend, and his mother told me she knew an Irish woman who was still in touch with my real mother. After a lot of searching, I found out that my real mother, Peggy Curran, was still alive and living in Arkansas, USA with my sister and three half brothers. One night, I plucked up courage and telephoned her. Her first words were, "Is that really you?" In 1984 I went to America and met her for the first time. Obviously it was an emotional reunion, but when I got there she refused to tell me anything about my real dad, so I still felt confused."

IRELAND MEETS POLAND

How did the radio programme which led to the making of the CD come about?

"It started in 1991. Tom Robinson, who I'd worked with, was very friendly with Simon Elmes, the producer of a BBC radio programme called Tuesday Lives, in which people recounted their extraordinary life stories. I appeared on the show and told them how I'd been adopted as a kid, how I found my real mother and sister in America, and so on. The programme got a really good response from the public -I got a lot of letters - and at the BBC, Simon was very keen to work with me again. We discussed various ideas for another radio show, though nothing happened for a while. In 1995, I went to Ireland for the first time, to Ballina, County Mayo, where my mum was from. It was the most extraordinary revelation -I found out my mum had been quite a famous showband singer. I really felt like I'd found something that had been missing, and I felt very at home there.



O Andrew N/cC |b|

When I came back, I told Simon what a special trip it had been, and he came up with the idea of doing a programme about it, something which combined speech and music. I agreed to do it, but then immediately forgot all about the idea. Then I got a phone call to say that Radio 3 had officially commissioned it. There was a moment of panic. I felt like saying "You don't understand — I can't actually do this!"

What were you afraid of? If they'd asked you to just come in and play a couple of songs, you'd not have thought twice about it...

"I think it was untested ground. I thought it might be a technical nightmare, and at first, I didn't know how it was going to work. Part of the proposal was that we flew my [adoptive] dad back to Poland and my [real] mum back from the States and interview them both. In the end, Peggy wouldn't come over — she says she can't 'get to grips' with that part of her life - but we interviewed my adoptive mum and dad at Broadcasting House, then Simon came to my home studio and interviewed me. Finally, we flew to Ireland to talk to people who knew Peggy. and to Poland to take my dad back to his home town, Ruda. He's 84 now, and had some horrendous experiences in the Second World War. We found his village, and recorded anything and everything onto DAT, train noises, station announcements... a lot of location sound effects, which I was able to use later to create soundscapes. The visual stimuli in Poland triggered some fantastic memories for my dad, and every day we'd come back to the hotel and talk about his life. We also visited Auschwitz, where we recorded some conversations... that was really very weird, there was a very strong atmosphere about the place."

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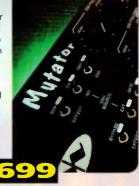


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IAKKO IL JAKSZYK

Jakko Jakszyk • The Road To Ballina

THE ROAD TO BALLINA

So the idea was that you would take the interviews and construct music around them?

"Yes. It was Simon's idea, to have this kind of musical odyssey about my life and utilise these interviews in some way. My concept was to make the speech and music integral to each other. I'd heard the Steve Reich piece 'Different Trains'. which uses extracts from taped interviews. It's minimalistic, but parts of it are very effective. Another influence was the Frank Zappa Meets the Mothers Of Prevention album, in which he combines scored music with improvised dialogue."

Did you compose any music before the interviews were completed?

"Yeah, I wrote one piece, the opening title track. It's a slightly sad Irish thing which sets the scene. When I was in Ireland, I became very of Irish music. and a big fan of Davy Spillane in particular. Uillean pipes were out of the question - too expensive and unbelievably difficult to play - so I bought a low whistle, which I play in that piece. It's a kind of bass flageolet, fairly easy to play, though there are a few special techniques, like bending notes and a weird

> kind of fluttering vibrato. Having written the piece and recorded the low whistle. I added a cello part. But then, for the other pieces, I had to select material from the interview DATs, and that was a nightmare. If I did something like this again, I would ask someone from the BBC for a transcription, but as it was, I was dealing with 10 or 12 hours of unlogged material. I had a couple of very frustrating days wrestling with it all, but the breakthrough came when I started working with some things my [adoptive] mum had said. There was a section where she was talking about adopting me, and there was this phrase, 'I wanted a child'. When I sampled it. playing it back, it had a little, lilting rhythm, and an element of melody to it. I

thought it it would be nice to have some child-like, nursery-rhyme-like music accompanying it, so I came up with this piano figure. It fitted like magic, and I was off. That was the way in for me."

THE REVENUE & LEVEL 42

THE ROAD TO BALLINA

Like most self-employed musicians, Jakko has had lean periods, but few will have experienced the dramatic reversals of fortune he suffered a few years back

"It happened at the end of 1990. I'd done well financially in the mid-'80s, through publishing, songwriting, production and record deals. I'd never earned that kind of money before, so I went to a financial adviser, who advised me to invest it in the stock market. I gave him a cheque for 40 or 50 grand, the stock market crashed, and I lost over half of it overnight. When my tax bill came in, I couldn't afford to pay it, and this whole nightmare started. Fines, penalties, interest, unpaid VAT by the start of 1991 I owed about 65 grand. I tried paying off little bits, but I was just sinking fast.

"One morning, I got this letter from the Inland Revenue saying they were going to make me bankrupt. I thought that's it, I've lost the house, the studio... and then, seven days later, the phone rang and it was Mark King from Level 42, who I'd never spoken to before in my life. They'd been looking for a permanent guitar player and Mark had seen me play live on TV with Tom Robinson on, of all things, The James Whale Show - I had to be persuaded to do that show. I couldn't really believe it was Mark King; I thought it was someone playing a practical joke. I said, 'Do you want me to come down and audition?', and he said, 'No, the job's yours'. So one minute I'm bankrupt, the next I'm standing on stage with Level 42 in front of 20,000 fans. The financial problems didn't go away overnight, but that, plus support from my bank manager, saved my bacon."

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That technique occurs throughout. There's one part where you say 'the luxury of sentiment', and quite unexpectedly the whole backing track leaps up and plays the phrase with you. It's very clever.

"Well, it gave me a way of dealing with the narrative. My next idea was this atmospheric repeating 5/4 motif which accompanied my mum's second story, about her youth in France. We got to a certain point in the story where it takes a very nasty, dark turn. That demanded an equivalent mood change in the music, so the dialogue was driving the music."

Much as it would in a film. I guess you had to keep dipping into the DAT and taking samples, trying them out with the music, until you eventually settled on certain evocative phrases?

"Yes. Those samples represent the gist of the story. I had to edit out whole chunks to propel the narrative, and the dialogue had to maintain an overall narrative structure, but within that, I was able to take certain sections of speech, repeat them, echo them, strengthen them, answer them or whatever. I also composed some music based on a 3/4 Polish Mazurka rhythm. While we were in Poland, I thought it would be nice to buy some tapes of traditional music, but it was impossible. You'd go into a record shop, and it was all bloody Level 42 albums."

THE SUPPORTING CAST

Speaking of Level 42, I notice Mark King is playing bass on *The Road To Ballina*.

"Yes, you can hear him on the piece of music that bursts in after I say 'He made me my first electric guitar' [on the track titled 'The House Was Always Empty', in which Jakko talks about his childhood]. Gavin Harrison plays drums on that track, and there's some nice cello throughout, plus trumpet and saxes."

Did you record all the musicians in your home studio?

"More or less. We did the drums, cello and trumpet here, but recorded Gary Barnacle [sax, from Level 42] at his fantastically well-equipped

home studio — he has four ADATs, a mixture of the old and XT models. Mark's bass was recorded at his studio on the Isle Of Wight, using a Trace Elliott valve preamp, which I also own. You can just take a DI feed directly out of the back."

Does Mark King use ADATs too?

"No, he uses Tascam DA88s; that was a bit fiddly, I must admit. I took a mix on DAT minus the guide bass part down to Mark's studio, and we bunged that onto two tracks of the DA88. Mark then recorded all his bass in sync with the Tascam. but onto his hard disk recording system. We then mixed the bass down onto one channel of a DAT. with a mono guide mix of the backing track on the other channel. I took the DAT home, dumped both tracks back onto one of the ADATs, and made a digital copy onto a second machine. By adjusting the offset in the latter process. I was able to get everything back into perfect sync. It was worth it. Mark plays great, and really adds something to it. At first, he just followed the changes, but then I asked him to cut loose a bit. I said, 'What we want here is Jack Bruce' - and that got him going. The section that follows has a strong Frank Zappa influence, with unison tuned percussion phrases. Everybody's doubling the lines, even the bass."

What mics did you use on Gavin's drum kit?

"Gavin brought in some of his own: a Beyer M88 for the bass drum — which is apparently Phil Collins' favourite vocal mic because of its pronounced bottom end — plus a pair of Schoeps CMC5s which Gavin uses as overheads. They're very nice mics. I used three of my SM58s for snare and stereo toms. I rarely use more than five tracks for drums — kick, snare, hi-hat, and stereo toms and cymbals. I'm not into all that '70s bollocks of isolating each drum and trying to make all the sounds really separate. I just go for an overall picture — that's how a kit sounds in real life, so I record it that way. As a rule, unless I'm going for something deliberately wacky, I don't go in for a lot of panning on the kit, or put different reverbs on

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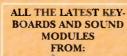
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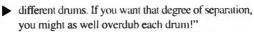
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Your recording area here at Silesia Sound is fairly small — does that cause any problems?

"I don't think so. The first time I recorded Gavin, I got an enormous shock — I brought all the mics up on their channels, balanced them, and it sounded absolutely fantastic. I hadn't done anything! It made me realise what bullshit all that 'getting a good drum sound' business is. If you have a good player, a good kit and the right microphones, there's no need to agonise over it. I found I had to use very little EQ on Gavin's kit."

Did you compress the drums?

"No. I tend to use compression only on vocals and acoustic guitar. I might occasionally use it on a clean electric guitar sound, but with distorted lead guitar the sound is already flattened out. Having said that, I don't have a fixed way of doing things, apart from sticking to certain vocal compressor settings."

This is a nice, quiet residential area. Any complaints about the incessant racket?

"Yes, I frequently have to ask my neighbour to turn *The Archers* down. But it's amazing how little sound leaks out of this place. I bought the house because it had a double garage I could convert into a studio. The garage was in terrible condition, but a local builder rebuilt it for me, with the help of a few BBC text books on soundproofing! The woxden floor is floating on a rubber layer, and the walls are stuffed with rock wool — it's that kind of heavy insulation which prevents the sound from escaping. The whole

thing only cost seven grand, but after that I had no money left for acoustic treatment. I just put a few carpets on the walls — it sounds OK, though! If I had one criticism, it would be that the sound changes a little as you move round the room."

STRINGS, NOTATION & TECHNICAL

I liked the stereo string pads on your CD. Is that a workstation sound?

"It's actually a combination of a Roland MVS1 Vintage Synth and an old Yamaha TG33, plus some Denny Jaeger violin samples. I find the samples supply a realistic front to the note, but the modules give you a nice sustaining wash. I've also got the Emu Proteus 2 orchestral module, which has some nice pizzicato cello and double bass patches. I use the Proteus for individual string parts, as opposed to pads."

Did you write parts out for the musicians?

"I used Emagic's *Notator* to print out some lines for Caroline Lavelle, the cellist. The *Notator* version looked very plausible, but she re-wrote it in her own hand anyway, as she found it easier to read. Gavin just wrote a few sketchy notes for himself — there was one little tuned percussion quintuplet thing, five against four, that he had to notate. I can't actually write music out myself, but it's never been a problem. I could always hire a copyist if I was writing for a bigger ensemble."

Were the BBC concerned about the technical quality of your recordings?

"In fact, everybody said how good they sounded. Had there been more time, I would like to have worked on the dialogue more and used more live musicians. My original idea was to go back to the BBC with all the interview DATs, load them up into a SADiE digital audio editing system and clean up the dialogue, compress it, level-match it or whatever, but we just ran out of time. In the end I did all that processing through my desk, recording everything to tape very carefully."

What happened with longer sections of dialogue? Did you run out of sampler memory?

"My sampler only has 8Mb of RAM, so I had to record some pieces of dialogue to tape. In a way, that made it easier, because I didn't have to keep juggling with samples. There also came a point when I wanted to record acoustic instruments, so then everything had to go on to tape. Some kind of hard disk recording system would have made all this a lot easier, but the budget wouldn't stretch to it. I don't even have a hard disk for my sampler, so I had to back everything up on floppy disks. Lots of them..."

Having relatively limited gear can be a good thing, because it forces you to use your imagination...

"That's true, but after all my tax problems, I can't afford a load of expensive gear anyway!"

Jakko is now working with BBC TV on a story about the life and suspicious death of Mario Lanza. On the family front, there is new evidence that his father was an American serviceman.





JAKKO'S WONDERFUL CAREER

It would be fair to say that unlike his yelping crotch-grabbing American namesake, Jakkoⁿs solo career was slow to ignite. Was it bad luck, or some kind of gypsy's curse?

"I don't know, it was so frustrating. The basic problem was the lack of a hit single, but there was a lot of A&R interference, which drove me mad. Nobody knew anything, but that didn't stop them showing up at the studio and asking for all sorts of pointless changes. It was particularly bad in America, where there was lots of drug-fuelled nonsense going

on — executives coked out of their bonces making arbitrary decisions which they'd change the following day. Your whole career was in the hands of these people, and there was bugger-all you could do about it. It was so demoralizing. In the UK, my third label were the best of the bunch — they were all set to release my album, when their parent company dropped them. They never interfered with my music, and were very fair financially. However, it did worry me that they employed a spirit medium. He was on the payroll — he'd even attend board meetings — and the boss insisted that all the new signings go to see him so he could predict their future."



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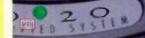
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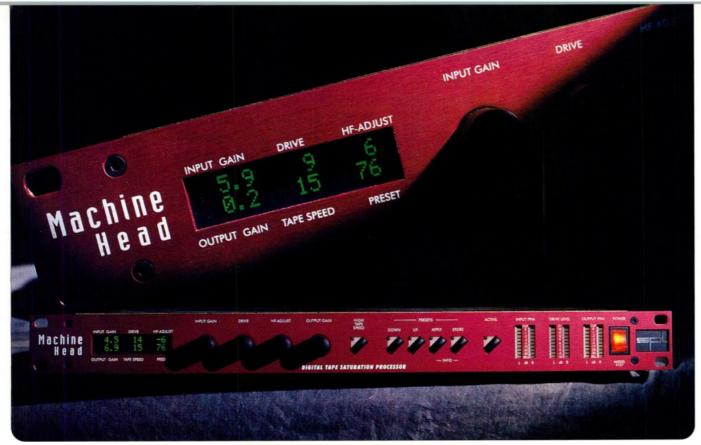
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Geal SPL MACHINE HEAD DIGITAL TAPE SATURATION EMULATOR

Tape saturation is the latest thing to get the physical modelling treatment. Can two high-powered DSPs, however, really achieve the same effect as a strip of rust being dragged over a magnet? PAUL WHITE investigates.

t seems that the greater the advances made in digital recording technology, the more people look to retro technologies to add some kind of mystique back to the sound. The valve versus solid-state debate goes back to the '60s, when solid-state guitar amplifiers first appeared; in recent years, we've seen renewed interest in valve microphones, valve preamps, and valve outboard gear such as compressors and equalisers. There's little doubt that well-designed valve equipment does change sound in an artistically desirable way, but now that hard disk recorders, DAT machines and digital multitrack tapes have taken over from openreel analogue machines, the latest candidate for nostalgia is the analogue tape sound itself.

For a few hundred pounds, you could buy a good used mastering machine, such as a Revox B77, and bounce your DAT tapes off that to add the necessary magic — but along with that magic come tape noise, wow and flutter, and an inability to control the effect very precisely.

Enter modern technology and SPL, who, in conjunction with some very talented software designers (the same ones responsible for the most excellent Steinberg *WaveLab* optional plug-ins), have built a DSP-based hardware box that models the desirable attributes of tape saturation entirely

in the digital domain. Being able to do this digitally is particularly important when you're mastering, as recordings can be processed without ever leaving the digital realm. To ensure a certain amount of future-proofing, signals of between 16 and 24 bits can be accommodated.

In keeping with the SPL philosophy, the Machine Head has very simple controls, but what goes on inside the box is actually rather clever. Tape-saturation effects are not as simple to model as you might think, not least because audio signals are pre-emphasised before recording as a means of optimising the signal-to-noise ratio. The process is, of course, undone on playback to restore the original signal characteristics, but any tape-saturation effects due to the non-linearity of the recording medium affect the signal between these two stages. Among other things, this means that high frequencies (those that are pre-emphasised) are subjected to more tape compression than lower frequencies. Furthermore, the compression isn't the same as the type you'd expect from a conventional compressor — these simply adjust the overall envelope of the signal, whereas tape compression modifies the shape of each individual wave being recorded. The higher the level, the more non-linear the recording process; in practical terms, this means



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SPL Machine Head



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that not only are high-level peaks reduced in level, but harmonic distortion also takes place. This combination of frequency-selective dynamic cycleby-cycle compression and harmonic distortion is largely responsible for the warmth and power of analogue recordings, and SPL's Machine Head models many of these factors very precisely.

If that's all the Machine Head did there would only be one knob, but the designers have added a little more creative potential by making the high-frequency saturation characteristics variable to such an extent that you can actually reverse the high-frequency damping effect of tape and turn it into high-frequency enhancement. You can also select the speed of your imaginary tape recorder — though, in the interests of preserving sanity, no varispeed control is fitted!

THE RED BOX

The Machine Head comes as a very deep 1U rack unit and is based around a pair of Motorola 56002 DSP chips clocked at 66MHz. There are no analogue ins or outs, but both AES/EBU and S/PDIF digital options are supported; in the event of a power failure, the input is routed directly to the output via a hard relay bypass. The processing delay is around 5ms, and this is compensated for when bypass is operated, by which I assume that the bypassed signal is also delayed by the same amount. Operation is strictly stereo. RS232 and 434 sockets are fitted, so the Machine Head can be connected to a computer: these are important, as future software upgrades can be loaded in directly from a computer (Mac or PC), via a modem cable. For applications in systems sync'ed to digital word clock, the Machine Head has a word clock input and Thru connector with switchable 75 Ω termination; there are also MIDI In and Thru sockets enabling stored patch settings to be recalled over MIDI.

The operator has a fairly easy job, with just four knobs and one button to set up the parameters, and five further buttons to deal with the selection and storing of patches, plus bypass. Three sets of stereo PPM meters monitor the input level, the drive level (how hard the virtual tape is being driven into the virtual red), and the output level; to provide a comfortable analogue feel, the four encoder knobs have a smooth rather than a stepped action. The first LED of each input and output meter lights steadily when a compatible digital input is being received.

A small LCD window provides information on patch numbers, parameter values and various aspects of the system setup, and the four rotary controls are used to adjust the input gain, the drive amount, the HF compression characteristics and the output gain.

The Tape Speed button changes the 'speed' of the virtual tape machine from 15ips to 30ips — though the differences are very subtle, it's nice to have the choice. To avoid accidental patch changing, the Apply button must be pressed for at least one second before you use the Up/Down keys, otherwise they're locked out. Holding down Apply again loads the patch, and you can store up to 99 presets. This is fair enough, but the Apply routine can be a little slow, so it would have been nice to be able to disable it in the setup menu, enabling instantaneous patch changes with just the Up/Down buttons.

To save a setting, press Store for one second, then, when the LED above the switch flashes, find the destination patch using the Up/Down buttons. Holding these down causes the presets to skip through in groups of five. When you've found the location you want, depress Store again to complete the operation. Pressing Store and Apply together will bring up a menu showing the details of the digital data stream, such as I/O format, sample frequency, copy prohibit flags (setting or erasing), error flags, emphasis and so on. The Up/Down keys are used to navigate from page to page, and this section also enables the MIDI channel to be set and the serial input (RS232 or RS434) to be selected. MIDI commands can be used to change settings during a mix without causing glitching, and it's even possible to use MIDI volume commands to produce fade-outs, which is a nice idea.

MACHINATIONS

Operating the Machine Head is very straightforward, and is largely a matter of setting the input gain for maximum level without clipping, then adjusting the Drive level until the right amount of effect is being added. Finally, the output level needs to be set for the maximum level without clipping on signal peaks. The HF adjustment is best done by ear, and the tape-speed adjustment is so subtle that the difference in harmonic structure is inaudible on most material. Of course, the question is: what does analogue tape saturation sound like, and is it a good idea?

Because the tape-compression algorithm has the effect of holding down the level of signal peaks, there's a subjective increase in average signal level and a consequent increase in perceived loudness; if you go heavy on the processing, this can be as much as 10dB. This is easily verified just by setting the output gain so that the input and output are subjectively the same level, then looking at the actual difference in peak levels as shown by the meters. On a more subjective level, the squashing of transients makes the overall





SPL Machine Head

▶ sound a little more comfortable and better integrated, and instruments such as electric guitar sound smoother and more powerful. Vocals also sound thicker and seem to sit better in the mix. If all this sounds like the kind of pseudo-scientific burble you hear when people are eulogising about valves, that's because the effect of tape saturation is really very similar to that of tube saturation. Interestingly, material that's already been recorded on analogue, passed through a tube device, or compressed hard, doesn't benefit much from the treatment, but a DAT master made without the benefit of compression during mixing really does sound a lot louder and warmer after processing.

SUMMARY

Because the Machine Head is so simple to use, I found the ability to store and recall patches virtually unnecessary; if you want to return to a project later, though, I guess it could be useful. However, you can't name patches, so you have to remember them by number. Once a patch has been called up, all the control parameters are visible on the screen at one time. Adding the MIDI fade utility is obviously useful, but I found myself asking why SPL hadn't put a few more features in this box to help justify what is

"The Machine Head has very simple controls, but what goes on inside the box is actually rather clever."

undeniably a high price tag for a very specific process. For example, I'd have liked to see some form of digital EQ included, and a sample-rate conversion facility would also be immensely useful in a mastering situation.

Wish lists aside, what the Machine Head does it does extremely well. As far as I can judge, the analogue tape saturation simulation is extremely authentic and very controllable, and the unit is certainly easy to use. In the analogue domain, a good tube preamp or even an SPL Charisma unit will produce a broadly similar result, but in a mastering situation the Machine Head has the advantage that it keeps everything digital, and doesn't place a further burden on an already heavily loaded computer audio workstation. It's expensive, but if you want to do the job properly...



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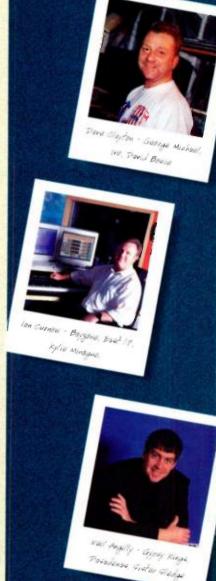
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PAUL WHITE studio tests a compressor whose main claim to fame is that you can't hear it working. Is transparency merely an attribute of the Emperor's new clothes, or is this

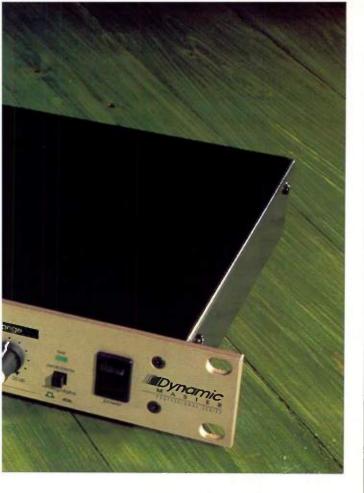
unit something rather special?

pros & cons HÖF DYNAMIC MASTER · Incredibly transparent, even at high gain reduction settings · Simple user interface. • Excellent metering. · Impeccable audio quality. cons • Expensive. summary A serious dynamic range control tool for use in both analogue and digital mastering SOUND ON SOUND

oday's marketplace is full of compressors that deliver a punchy sound, or a warm sound, or a vintage sound — but where do you look when you need a compressor that doesn't change the sound of the music at all? For example, if you're mastering an album and you need to moderate the dynamic range of the music without changing the feel or the overall sound, you need a compressor that's effectively invisible. The same is true if you're producing a TV commercial that needs to sound as loud as possible on air, yet shouldn't sound compressed. Aphex are probably the company most commonly associated with subtle gain control, and their Compellor is used in mastering suites and broadcast studios worldwide, but now they have a challenge from Austrian manufacturer HÖF Audio, who claim to have made some advances in this field.

Technical details on exactly how the HÖF Dynamic Master works are deliberately vague, as the designer is more than a little concerned about being copied (he even scrapes off some of the Integrated Circuit numbers). However, from what I can tell, the overall process is very similar to that used in the Aphex Compellor, but implemented in a different way.

The Dynamic Master is essentially a full-band compressor, but it also includes a leveller for keeping the long-term signal level constant, a soft-knee limiter, and a fast peak limiter (called a Peaker) to prevent the output from exceeding a set maximum level. As I understand it, the Peaker limiter includes a clipper, which permits very short spikes to be clipped rather than subjected to overall gain reduction, and this is a principle that Aphex have used and refined in their Compellor. Experiments show that the human ear is incapable of registering very short periods of clipping, so by allowing up to, say, 1ms of clipping (the actual duration used here is not divulged) before the limiter brings in gain reduction, you can achieve much greater perceived loudness while still preventing overshoots. Apparently, clipping becomes more audibie if several peaks are allowed to clip in quick succession, and Aphex have an intelligent circuit that reduces the amount of time for which clipping is permitted when the peak density is high. I would imagine that a similar strategy is used in the Dynamic Master,

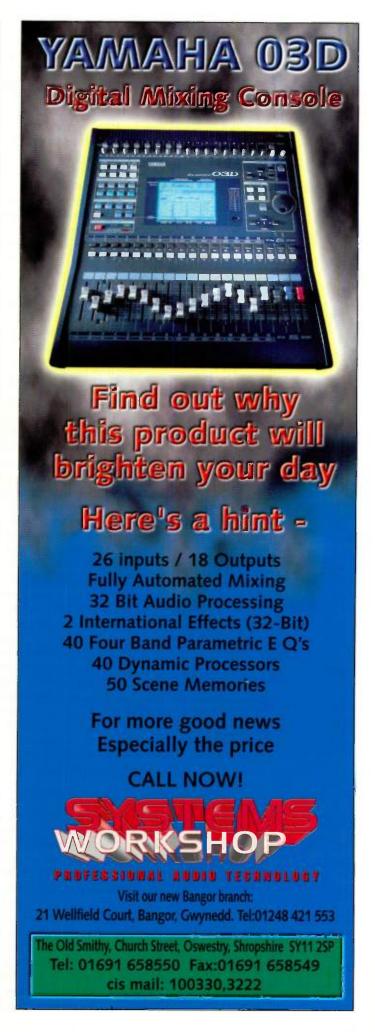


because even deliberate abuse fails to make clipping audible. The Peaker may be switched out of circuit when not required — when mastering to analogue tape, for example — though the soft-knee limiter will remain active.

A further stage of processing comprises a 1:2 expander to keep the noise down during signal pauses, and because the Dynamic Master is designed specifically for working on stereo material in a mastering situation, the two channels are permanently linked and are controlled from a single set of front-panel controls. All the dynamic control functions in the unit have a soft-knee characteristic to make gain control as unobtrusive as possible, though I assume that the Peaker is a hard-limit device. The manual includes a discussion of compressor characteristics without actually saying which ones are employed by the Dynamic Master, but reading between the lines I think it likely that this model uses a multiple-step release system, allowing it to cope with both short-duration dynamic events and long-term signal averaging.

As you'd expect, the compressor has a user-adjustable threshold. Depending on the dynamics of the programme material, the leveller is brought into play automatically, the balance between short-term compression and long-term levelling being set using the Density control. Because it would be undesirable for the leveller to bring up the system gain during pauses between tracks, or other gaps, there's an automatic hold circuit that detects gaps and maintains the gain reduction at the previously set value until playback resumes. Amongst other benefits, this prevents the compressor from bringing up background noise during pauses.

If a continuous test tone is applied to the input and the Peak mode switch is operated, the circuitry puts the machine into Setup mode, allowing the user to calibrate the output potentiometer positions to the limiter action. The whole procedure is described step-by-step in the manual. During calibration, the Peakers, compressors and levellers are bypassed and the soft-knee limiter operates at the Peaker's threshold. A green Test LED shows when the calibration/test mode is active.



HÖF Dynamic Master

HÖF HARDWARE

Now that I've dispensed with the basic theory, I can reveal that the physical embodiment of these diverse processes and principles is a stylish but fairly conventional 1U package, with balanced XLR audio connections and a relay-operated hard bypass. Rear-panel switching is available to select between +4dBu and -10dBV operation. Separate control is provided over the input and output levels of both channels, via precision pots, presumably so that imbalances in the programme material can be compensated for, and for all the internal complexity of the compressor, the only controls are for Threshold and Density, with the expander section having Threshold and Range controls.

With so many gain-reduction processes going on at the same time, it's important to be able to keep track of exactly what the unit is doing, and here the designers have hit on the elegant solution of using tri-coloured LEDs for the metering: these show red for limiting, green for compression and orange for levelling. The 10-section meter shows the gain reduction in 2dB steps, but a multiplication button allows this to be changed to 1dB steps if desired.

While the degree of compression can be controlled using the Threshold control, the limiter's upper level is preset and independent, so it is possible to apply less compression and more limiting by increasing the compressor threshold and increasing the overall input gain setting.

Compression Density is related to the release time of the compressor, but a degree of parameter interactivity makes this less simple than it might first appear — even the soft-knee limiter is linked in somehow. When the control is set fully anti-clockwise, the main function is levelling, so the majority of changes are in long-term level control. As the control is moved clockwise, the compressor starts to react to shorter-term events, so you get less levelling and more compression/limiting. The result of a higher Density setting is also to increase the average energy of the mix, by reducing the dynamic range between signal peaks and the average signal. A green LED shows when compression is taking place, and a yellow Hold LED comes on during programme pauses, to show that the gain-reduction amount has been frozen.

IN USE

Because the whole idea of the Dynamic Master is that you shouldn't hear it working, it's important that you have a fast PPM meter somewhere at the end of your audio chain, so that you can verify exactly how much dynamic range compression is taking place. A lot of what goes on happens during brief signal peaks, so with slow meters you might think you're gaining less than you really are. I would imagine that in most normal situations you might only want to skim a few dBs off the signal peaks, but you can can actually apply a huge amount of gain reduction with the Dynamic Master before the process becomes at all noticeable, and even then it stays remarkably musical. Especially impressive is

the fact that you can really level out a voice-over but still leave it sounding quite natural. The expander is also extremely smooth on vocals.

When mixing music, you can use the Dynamic Master to enable you to get the maximum possible level onto a digital master recorder but with the absolute certainly that clipping won't occur. It also keeps the stereo image fully intact, which isn't true of every stereo compressor. Compression and levelling can be applied as required, but I'd recommend you monitor the output of the Dynamic Master when mixing, rather than simply setting up a mix and then compressing it, because with some types of material heavy compression can change the apparent balance of the mix, even though the sounds themselves seem unchanged. This is true of any compressor, though, and I have to say that the Dynamic Master manages to remain incredibly transparent under the most trying of circumstances.

The three-coloured metering makes it a lot easier to understand what's going on, and because you can juggle the amount of limiter action against the compressor/leveller action, it's possible to achieve audible compression for use as an effect, if you run the limiter harder than you might do normally. However, the real strength of the Dynamic Master is its ability to control levels without displaying obvious side-effects, so if you like to hear your compression working, this isn't the unit you should be looking at.

SUMMARY

The HÖF Dynamic Master is a specialised device that's most useful when mastering, especially to a digital medium such as DAT. Despite its complex internal workings, the user interface is very friendly, with excellent metering. Applications include both digital and analogue mastering, broadcast limiting, disc cutting, and even cassette production. If you're making a series of cassettes for in-car use, for example, you can hold the levels nominally constant without taking away the apparent dynamics of the original programme material. Obviously, the dynamic range is being reduced, but because the other audio cues are being preserved the sound doesn't appear stifled or compressed.

This is one of the best analogue mastering compressors around, but it's expensive by comparison with most regular compressor/limiters, and not dissimilar in price to the Aphex Compellor, with which it obviously competes. However, anyone with a cassette duplication system or mastering suite would do well to check out this machine, as it offers some very real advantages.

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France has never really been a country instantly associated with the production of great sampled sound sources, preferring to concentrate on the other things that they make so well, such as wines, cheeses and nuclear fallout in the South Pacific [steady on, old boy — Assistant Ed]. Univers-Sons are a company based in Paris hoping to buck this trend, and to this end, they have produced a mixed-mode two-CD release interestingly titled Basicussions — The Ultimate Percussion Tools. CD one is given over entirely to conventional audio tracks of numerous

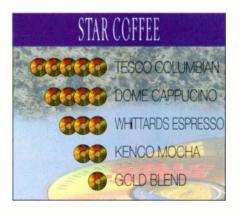


percussion loops including shakers, tambourines, triangles, congas, bongos and jembes. The loops are presented in a number of different musical styles, such as funk, fusion, latino, and swing, and are recorded at three main tempo settings, 89, 100 and 119bpm (although there are a couple at 133.5bpm). Within each tempo set, there are usually between three and seven different percussive variations on a theme, and these are designed to slot effortlessly together, allowing the user to construct their own percussion tracks with relative ease.

CD two contains all the Akai CD-ROM data, as well as 16 tracks of audio featuring recordings of single shots of all the individual percussion sounds used in the loops. As you might expect,

the CD-ROM part of the disc is pretty much an exact copy of the audio CD, except for a bonus section at the end featuring an enormous selection of wonderful drum sets pillaged wholesale from the likes of the best Roland, Alesis, Yamaha and Emu drum modules. This is actually guite a neat and usable inclusion, with some of best sounds coming from the Roland 'House' and 'Latino' kits. On the CD-ROM, each partition and volume is listed with its size in megabytes, and with a few exceptions, you will be pleasantly surprised just how memory-efficient many of these programs are. Anyone with the patience to build a complete track from the tambourine or triangle upwards will probably enjoy tracks 24 to 35 on disc one, but the rest of us can ignore these 'white elephants' and delight in the fact that Basicussions represents very good value for money (the two-CD set retailing at just

On the whole, this release has an easy-going and largely creative feel to it. The layout is logical and the recorded quality of the samples is just as good as we have come to expect. The strongest part of the release is almost certainly the mixed percussion loops at the start of the discs, but the conga and bongo loops are also highly authentic and very, very funky. Where other releases bombard us with every conceivable odd drum and shaker extracted from the rainforests of South America, this release gives us a sensible collection of well played and recorded percussion loops using just a few favourite and well chosen instruments. If you want a strong latin funk feel and you like your sounds edited and ready to go, with a free audio CD to audition them with, you



could do a lot worse than put *Basicussions* very high up on your wish list. *Paul Farrer*

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SAMPLING SOUND SYSTEM VOL 5: G-SOUL



MIXED-MODE CD/AKAI CD-ROM

This is another volume in East West and Sounds Good's budget Sampling Sound System range of CDs. Also available in Akai format, this mixed-mode CD has PC and Mac sample data plus the same material repeated as audio. Track 1 contains the PC-format (WAV) and Mac-format (AIFF) data packs, so don't go playing it on your CD. I have a PC, but auditioning audio from WAV files is *much* more tedious than simply



playing audio, so, moving swiftly on...

Tracks 2 to 4 each contain 12 splendid lurching sexy loops at 70bpm. I can imagine Barry White crooning along with some fretless bass and a Fender Rhodes propping up the key. Then again, if I was feeling a little more adventurous, I might superimpose a jungle beat at 140bpm... Programming is in stereo with scant use of reverb. A wide palette of sounds is sensitively employed and inventively juxtaposed while the loops, even when they are falling over, feel well together.

The format stays the same, but the tempos wind up in 10bpm stages through 80, 90, 100 and finally all the way to 110bpm. Slow as that is, it feels positively rushed after all those 70bpm gems. There are some four-on-the-floor patterns, but hip-hop is what the people who put this CD together understand best. After the drums come all-too-few guitars: 12 clean, warm soulful licks that've probably been plundered already. Then some pretty neat synth, bass and orchestral hits, then some drum singles, and suddenly it's all over, in what seems like about 20 minutes.

Conclusion: With the emergence of UK soul as a commercial force to be reckoned with, this release is right on cue, with its creamy, high-quality, fresh soul drum loops and hits. It's short, but very sweet (and cheap!). Wilf Smarties

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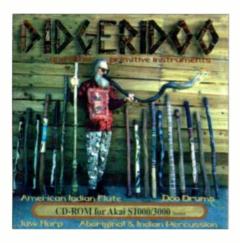
DIDGERIDOO



AUDIO CD/

AKAI & SAMPLECELL-FORMAT CD-ROM

This is one of those discs that sprung up as the result of somebody's obsession, and you only need to take one look at the sleeve below to guess that the obsessed Peter Spoecker is a West Coast American on walkabout! Touring the outback on a bicycle, and taking his own digeridoo with him, Peter recorded a huge amount of material, and for those of you who think the digeridoo is little more than a flatulent vacuum cleaner, the variety and virtuosity



demonstrated on this library should be a real eyeopener. However, if you read the sleeve notes carefully, it's implied that Peter played all these didge samples himself, which begs the question: what did he do with all those aboriginal recordings?

Even such an obvious obsessive as Peter Spoecker couldn't justify filling the *whole* disc with digeridoo, so you'll also find ethnic American Indian flutes, bullroarers, doo drums (melodic drums) and jaw's harp sections. On the whole, the quality of the samples is excellent, especially the digeridoo drones, and rhythmic loops, but the North American Indian flutes turned out to be disappointing in some areas. While the individual melodies and flourishes were nice enough, the multisampled flutes were unlooped, and weren't set up for vibrato, but worst of all, they sounded less convincing than most cheap synth flute patches. As the owner and occasional doodler on such a flute, I can say

with some conviction that these could have sounded a lot better. And why is it that sample CD-ROM makers don't map the multisamples onto one section of the keyboard and put the odd phrases on another within a single program, rather than putting them in different programs altogether? Surely that would be the most logical way of enabling you to join up the melodic snippets with tunes of your own? Finally, a guick warning to other Akai S2000 owners (that's what I used for the review, and discovered this problem on): be careful to load up just the samples and programs you want rather than loading in whole volumes and then using the data wheel to run through the different ones. If you load the whole volume, all the programs play at once, regardless of which one is selected, which means a visit to the edit page to sort things out. This happens on certain other sample discs too; I guess it all comes down to which generation of Akai sampler the discs were written for.

It's poetic justice that I ended up reviewing this disc after the 'build your own plastic digeridoo' project I put in SOS a couple of years ago [see SOS August '95, flatulent hoover fans], but it really does demonstrate the versatility of the instrument, especially its rhythmic capabilities. With the exception of the flute multisamples, the sounds are both well sampled, plentiful, and generally come in a choice of musical keys. Some Multis are also included for instant multitimbral gratification. You'll need as much memory as possible to enjoy some of the longer samples, though most fit into 16Mb of RAM. Paul White

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VINTAGE KEYBOARDS



AKAI & SAMPLECELL-FORMAT CD-ROM

It seems that anything vintage is fashionable, and in the keyboard line, that usually means analogue or mechanical. And that's exactly what you get in this aptly named library, which kicks off with a good selection of Hammond B3/Leslie programs, though for some extraordinary reason, the manufacturers have decided to name these programs using combinations of 0s and 8s, with just the odd 4 thrown in for good measure. For all I know, this could be a cryptic code for the drawbar settings, but if it is, the sleeve notes fail to mention it. The rest of the instruments are conventionally named, though as with the aforementioned Didgeridoo disc, my Akai S2000 played all the programs at once when I loaded up an entire volume, so you have to load just the program you want to use.

I have to say the Hammonds are really good, and there's a choice of Leslie speeds, but what really won me over was the regrettably short section devoted to the Sequential Prophet VS,

where the Dark Strings patch must be the definite analogue string pad of all time. The evolutionary ladder continues via the OSCar (mainly basses), Sequential Circuits Pro One, Moog Taurus, Farfisa combo organ, Vox Continental (weren't they dreadful?), ARP String Ensemble, Oberheim Matrix 12/OBXa/OB8, Clavinet, Rhodes and of course the Wurlitzer electric piano. Then comes the Mellotron — just strings and voice, and as rough as a porcupine's bum, but the die-hards will like it. Personally, I think the memory of the Mellotron is a whole lot nicer than the real thing!

Moog gets a look in under the Minimoog and Memorymoog sections, but although there are plenty of techno blips and deep basses, there



didn't seem to be any of those wonderfully fluid lead sounds that Minimoogs do so well. Roland's Jupiter 8, JX8P, Juno 106 and JX3P are given a brief outing, as is the ARP 2600, which it's nice to be able to use polyphonically. Lesser ARPs, such as the Odyssev, are also included. Of course, the Roland TB303 makes an appearance: the Chase Bit 01 also puts its head around the door briefly, and there's a token Korg in the form of the DW8000. Given that many of these samples make use of the Akai's own filters (and surprisingly nice they can be too), they still tend to take up quite a lot of space, with most at between 1.5 and 5Mb. This may be short by normal sample standards. but when you only have to sample basic waveforms, the loops can be very short indeed.

On the artistic merit front, the sounds are well sampled and convincingly analogue, but you rarely get more than half a dozen examples per instrument, unless you're a Hammond B3 fan, in which case this is your lucky day. Personally, after hearing the Prophet VS samples, I'd have settled for a disc full of nothing else! The quality is great, but the frustratingly small selection from each instrument pushes me in the direction of a modest 3.5 rating, though if you're buying this purely for the B3 samples, you'll probably rate it much higher. *Paul White*

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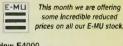
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Control Interest

Penny & Giles DC 16 MIDI controller

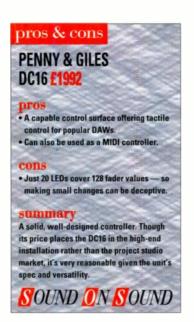
The DC16 is an assignable control surface ideal for use both with MIDI gear and software, and with digital audio systems such as Pro Tools.

MIKE COLLINS just loves being in control.

enny & Giles are well known in professional audio circles as manufacturers of the good-quality faders that you find in high-end mixing consoles from Neve, SSL and others. Theirs is not a name you would particularly associate with hi-tech MIDI products — but that's where you'd be wrong. Addressing the needs of the more well-heeled MIDI programmer and project studio owner, the Penny & Giles DC16 is a MIDI controller that provides 16 'endless' belt-driven faders with associated switches, a jog wheel, transport controls, and various other control buttons, most of which are user-programmable to suit the equipment you want to control.

The endless-belt faders can be programmed to handle any continuous MIDI controller function — or pitch-bend, or aftertouch. They can also function as group master faders, control note

"If it makes sense to use an external controller with MIDI gear, it makes even more sense with a DAW."

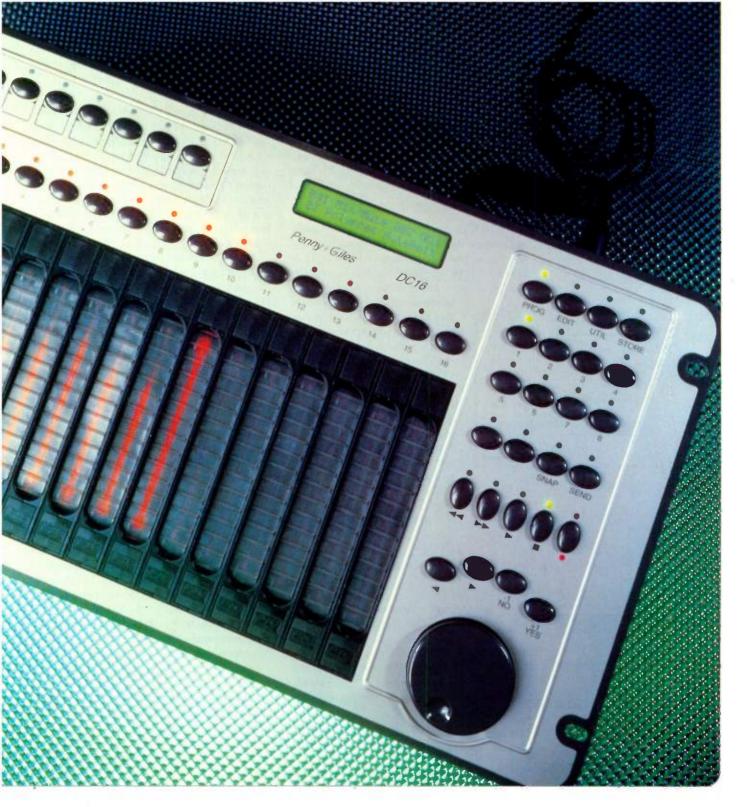


velocity, or generate strings of MIDI data with their current value inserted in the the string. The key switches can be programmed to generate notes, program changes and strings, as well as functioning as switched MIDI controllers or mute switches for the associated belt, when this has been programmed as a continuous controller.

The DC16 is designed to be mounted flush in a desktop adjacent to your MIDI rig or computer-based digital audio workstation (DAW), mixing desk and associated equipment. The rear panel features a socket to connect the external power supply, an on-off switch and fuse-holder, and two sets of MIDI ports for control data and merge data. Why a Merge input? Well, if you want to use the DC16's faders and switches to control the volumes and mutes for up to 16 MIDI channels, you connect the DC16 between your MIDI sequencer's output and the input to your MIDI rig, using the Merge In and Main Out sockets. Any MIDI data coming into the Merge input will simply be passed through to the Main output. And

when you move a fader or press a button on the DC16, it will generate MIDI volume or mute data which will be merged with the incoming MIDI data and passed on to the main MIDI output socket. If it makes sense to use an external controller with MIDI gear, it makes even more sense with a DAW. A mouse and a QWERTY keyboard were

If it makes sense to use an external controller with MIDI gear, it makes even more sense with a DAW. A mouse and a QWERTY keyboard were simply never intended to be used to control faders and switches on a mixing desk, so a dedicated controller featuring faders and switches is virtually a necessity for professional use with DAWs. The DC16 can now function as a workstation controller for various of the DAWs currently available — Digidesign's Pro Tools, Sonic Solutions' Sonic Studio, Soundscape, and others — and a second set of MIDI sockets, the Control ports, is provided for use with



these systems. Penny & Giles can also supply custom overlays for the DC16, which provide legending specific to its operation with these systems. By the way, one thing to watch out for when buying is that the DC16 needs a different EPROM for use with Soundscape, so check with your dealer first.

SETTING UP

I checked out the DC16 with my Pro Tools III PCI system using Pro Tools 4.01 software. I was using the custom Pro Tools overlay, so some of the function labelling I mention here comes from that. Configuring the DC16 to work with Pro Tools is very straightforward. First, you need to use OMS (which has become pretty much a standard requirement for MIDI on the Mac these days) to set up an Open

Music System device for the DC16. Using the OMS Setup application, you make a new device for the DC16. In the dialogue box where you make your settings for this new device (see Figure 1), you check 'Is Controller' but leave the receives and sends for MTC, MIDI Beat Clock and MMC unchecked, as these make no sense for a MIDI controller. The DC16 only communicates using MIDI channel 16, so make sure that 'Receive Channel 16' is checked, choose a suitable icon, and don't forget to save your new setup — and that's OMS configured.

In Pro Tools, just choose Peripherals from the Setups menu to bring up the Peripherals dialogue (shown in Figure 2). In the MIDI Controllers section of this dialogue, use the Type pop-up menu to select DC16, then choose the OMS source and destination

Penny & Giles DC 16 MIDI controller

for your MIDI controller. These should correspond to the input and output ports for your MIDI controller, which you've defined in your OMS Setup document. Once you close this dialogue box you'll be up and running, with the DC16 controlling your Pro Tools software. It couldn't get much simpler!

IN CONTROL

The DC16's continuous faders have LED displays incorporated within each belt to indicate the fader levels at all times, so working with the DC16 is very similar to working on a touch-sensitive motorised-fader control surface. Also, you can

reliably punch into your automation data at any point in time, since you are always at your automation null point — which is not the case with the cheaper controllers from JL Cooper and others.

Above each fader there is a button which you can set up to control Solo, Mute, Memory Location set/recall, Track Selection or Track Record Arming in Pro Tools. You can also switch the DC16's belt faders to control pans or auxiliary send

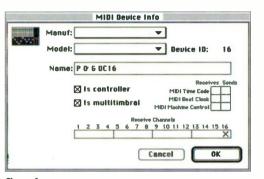


Figure 1.

"The DC16 ia a proven product which works with all the popular DAWs right now."

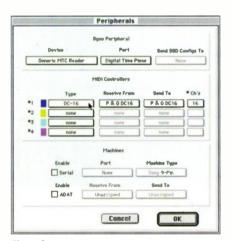


Figure 2.

levels, using the two rows of buttons at the top right of the DC16's front panel; another button lets you switch the faders to controlling plug-ins. And if you're worried that it could all get a little confusing, don't fret — a glance at the 2-line LCD will always reveal exactly what the switches and belts are currently controlling.

One of the best ways of working with Pro Tools is to set up memory location points at the start of each section when you begin. Using the DC16, this can be done very conveniently — with the fader switches set up to recall Memory Locations, you just press the Option key, then hit the Memory Location button at the point you want to set. If you're setting

up Memory Locations throughout the recording on the fly, with the audio playing back so you can hear the spot to insert your Memory Locations, it's a good idea to set the Preferences dialogue so that these Memory Locations are automatically named. Otherwise, you'll have to name your location and then hit the Return key each time, and often there won't be enough time to do this before the next point arrives where you want to insert a location

The DC16 has buttons for the five standard transport control switches: Rewind, Fast Forward, Play, Stop and Record. With the DC16 set up for Pro Tools, with its overlay, there are also four 'modifier' keys (Option, Shift, Command and Control) like the ones on an Apple Mac. Holding down the Control switch while pressing the Record switch repeatedly cycles through the various recording modes: Loop Record, Destructive Record, and QuickPunch. I particularly liked the four special modes provided using the modifier keys: Shift-Play gives you half-speed playback, Shift-Rewind returns you to zero, Shift-Fast Forward gets you to the end, and Shift-Stop gives you 'Abort Record Pass' — all useful stuff!

You also get a proper wheel to control scrub and shuttle, but you do have to learn the rules about how this works with Pro Tools. For instance, if you're using a multitrack edit group, Pro Tools will scrub or shuttle the topmost track pair in the edit group, but if you want to scrub or shuttle other tracks in the edit group, you must first disable the edit group, or use the Suspend Groups command, and then position the edit cursor over the track or track pair you wish to scrub, before entering Scrub/Shuttle mode. This can all get a little fiddly in practice, and at times I was left wondering why the Scrub feature didn't seem to be working — until I followed the rules!

WORKING WITH PRO TOOLS

So now you have the DC16's 16 belt-faders controlling Pro Tools' Mix Window faders. To help keep you informed about the current status, Pro Tools shows which tracks are under remote control by outlining the channel strip's name in colour. But are 16 faders enough? I have a 16-track Pro Tools system, but I often set up more than 16 channels in Pro Tools' mixer. So, for instance, I might have a guitar in the verse of a song on track 16, and want to use a different guitar in the choruses, which will need different level and EQ settings. No

NOT FADE AWAY

When you are using the faders on a MIDI controller, Pro Tools' Touch and Latch automation modes will begin recording only when the fader has passed through the present automation playlist value.

In these modes, the auto-matching LEDs on the controller indicate which way a fader needs to be moved to match the pre-existing data. When fader position and data match, the track will begin automation recording either after the 'touch time out' has expired (Touch mode) or when playback stops (Latch mode). This is invaluable, because

you don't have to manually null the fader to match the preexisting automation level at the punch-in point before playback begins.

On touch-sensitive motorised fader controls, or the DC16's belt faders, the relative position of the faders always matches the automation playback level.

The JL Cooper CS10 and the Peavey PC1600, two other MIDI controllers on the market, don't have motorised or belt faders. With these controllers, say you're adjusting a track's level whose automation track is playing back around +1dB, but the controller fader position is toward the bottom of its travel. If you move the fader in Auto Touch mode, Pro Tools

will immediately start writing new automation data — so, all of a sudden, the level of your track will drop from around the +1dB position down to the far lower level that the fader is actually at when you start to move it. You will hardly ever want this to happen!

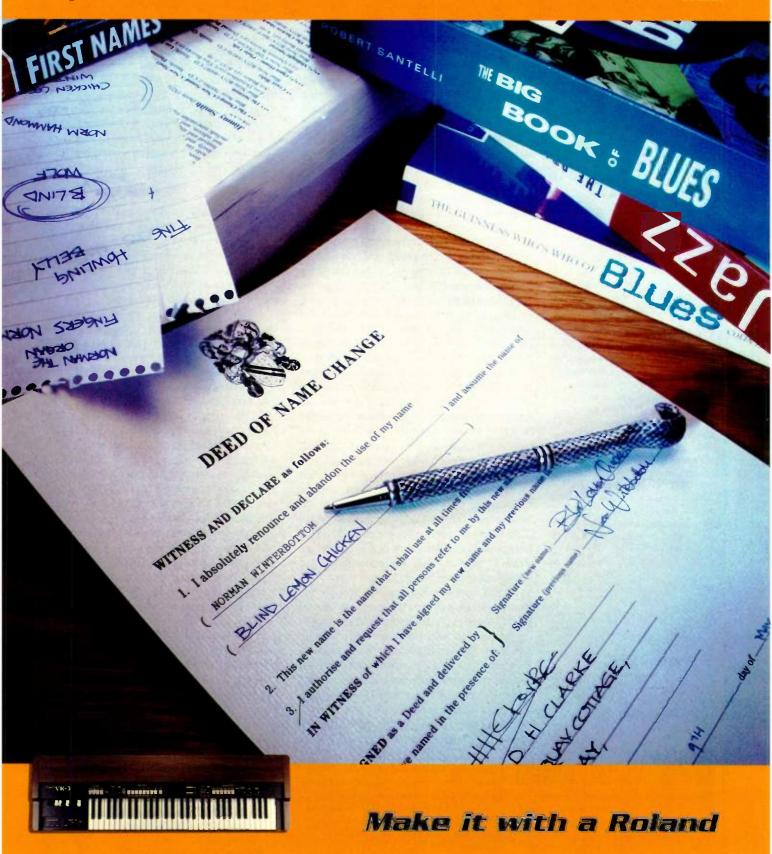
Using Pro Tools' 'pass through null' capability, the automation will not start writing new data to the automation track until you have passed through the null point and matched the automation track's fader playback. This solves the problem neatly, and Pro Tools' on-screen AutoMatch indicators let you know which way the fader must be moved in order to pass through the null point.

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Penny & Giles DC 16 MIDI controller

DEVIANT BEHAVIOUR

If you need to reset the DC16 for any reason - if you turn it off and on again, for instance - you should switch off the DC16, disable the DC16 settings in the Peripherals dialogue, and close the dialogue. Power up the controller, then re-enable the DC16 settings in the Peripherals dialogue. This is necessary because when you have the controller enabled, Pro Tools is constantly sending out SysEx status information to the controller. Powering up while this information is being sent will cause the input buffer on the controller to overflow, creating an error.

As it happens, I came across a problem with my MIDI rig while I was setting up the DC16. Error messages kept appearing to say that there were SysEx messages flying around and making the DC16's buffer overflow causing the DC16 to behave very erratically. After going down many blind alleys trying to make the thing work, I finally decided to connect the DC16 to my Opcode Studio 4 MIDI interface, rather than to my original MOTU MIDI Time Piece I. Bingo! The problem disappeared. It seems that the MTP was not handling the SysEx messages going between Pro Tools and the DC16 properly. So watch out for this one.

problem here! Pro Tools will let me create another mixing channel and assign this to the same recording/playback track from the hard disk as the previous guitar track. Because the verse guitar doesn't play in the choruses, you can record both parts to the same hard disk track, but play them back through separate mix channels.

By default, the DC16 will control the first 16 faders set up in the Pro Tools mixer. When you want to get to fader 17, the Bank switches enter the picture. If you simply want to move the whole bank of DC16 faders to the right (in other words, to control Pro Tools faders 2 to 17), just hold the Option key on the DC16 and hit the Bank > (Right) key. To get back again you hold Option and hit the Bank < (Left) key. If you hit the Bank keys without holding the Option key, you'll shift across 16 faders in one go — so hitting Bank Right will cause the DC16's faders to control Pro Tools faders 17-28, and so on. You can also use the Bank keys to control the horizontal Zoom level in Pro Tools' Edit window, by using the Shift key: Shift-Bank Left zooms in; Shift-Bank Right zooms out. Got all that? Don't worry, it's dead easy when you do it.

Next to the Bank switches you'll find Page Left and Page Right buttons, whose function here is similar to what it is in TDM plug-ins. They may also have more parameters to work with than the number of editing controls available on the DC16; in this case, Pro Tools divides the plug-in's controls into 'pages' which move a single page width at a time when you hit the Page buttons. Holding the Option key while hitting the Page buttons will take you to the first or the last plug-in control page. Again, by way of visual feedback, the plug-in parameters that the DC16 is able to access in the current page will be highlighted blue; automatable plug-in controls are shown in red in any Write Automation mode, and will turn green when in Auto Read.

All this works straightforwardly enough, but there are a couple of slight disadvantages to using the DC16 with plug-ins — for instance, you have to use the mouse to switch the Master Bypass on or off on screen. Also, no distinction is made between continuous controls and switched controls that only have on or off states, so faders and knobs are used to switch controls on and off in plug-ins, which can be a little disturbing at first.

Another thing you have to get used to is deciding what you'll control using the DC16 versus what you'll control using the mouse and keyboard. For example, using Pro Tools' Mix window, if you want to temporarily remove a fader from a mix group so that you can alter its level without altering the level of all the faders in the group — you just hold down the Control key on the Mac keyboard while you move the fader. At first I tried holding the Mac keyboard's Control key while moving a DC16 fader — till I realised that you need to hold the DC16 Control key for this to work.

CONCLUSION

The DC16 is really aimed at high-end installations, particularly in audio-for-video post-production facilities, where it will be regarded as a relatively low-priced unit to use with Pro Tools, Sonic Solutions, Soundscape and other popular systems, allowing the engineers to work with a more familiar user interface than the mouse and QWERTY keyboard.

Home users and project-studio owners may regard the DC16 as a little pricey compared with the alternatives. For example, the JL Cooper CS10 is not as good, but costs a third of the price, while a Yamaha 03D at £3000 allows you to control Pro Tools' faders from its faders and only costs about £1300 more than the DC16 — and gives you a full-blown digital mixer into the bargain. If you have a Yamaha 02R, new software should be available soon to let you control Pro Tools using the 02R's faders — and this will cost you just a couple of hundred pounds if you already have an O2R. If you're interested in vapourware. Mackie are about to release their long-awaited Human User Interface for Pro Tools, which promises to be an excellent unit, and Digidesign themselves have been threatening to bring out a professional control surface themselves for the last few years - although the release date keeps receding and the price keeps going up! (It's currently rumoured to be priced upwards of £5000 and to have full flyingfader emulation along with touch-based automation.)

Still, the DC16 is a proven product which works with all the popular DAWs right now. It's a solid, well-designed and versatile unit from a company with a strong background in making professional audio products, and the price is certainly reasonable for what you get. Having worked very successfully with the DC 16 hooked up to my Pro Tools system for the last couple of weeks, I can certainly give it my personal vote of confidence.

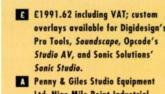
MULTIPLE MIDI

Pro Tools 4.0 software allows you to use four different MIDI controllers with Pro Tools — the JL Cooper CS10, Peavey's PC1600, and the Penny & Giles MM16 and DC16 models. The necessary computer code to allow these units to work with Pro Tools is supplied as files called 'MIDI controller personalities', located in the Controllers folder within the DAE folder inside the

These MIDI controllers allow you to access most of Pro Tools' on-screen controls - such as level faders, pan, mute, solo, sends, transport, scrub/shuttle, and DSP plug-in parameters

(remembering that DSP plug-ins are only available for TDM systems, of course). Using the modifier keys (Shift, Control, Option and Command), the basic Pro Tools commands for creating selections and regions, zoom views, and memory locations, and enabling online/offline status are also accessible.

Pro Tools even allows you to 'mix and match' MIDI controller types and have them act as a single bank. So you could use a DC16, CS10 and PC1600 all together at the same time with Pro Tools — which would create a MIDI controller console 40 channels wide. Now if you bank-swap this extended console, you will actually be switching 40 faders at a time!







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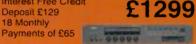


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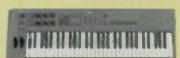
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COTTE Z SYSTEMS z 1616r DETANGLER TINDER

Now that digitital equipment is arriving in project studios, a digital patchbay becomes a worthwhile purchase. MIKE COLLINS goes back to his routes...

hat's in a name? Quite a lot if it's the name of this product, although the convoluted title is quite appropriate once you know what the Detangler does. It is in fact a patchbay and distribution amplifier for digital audio signals, and you can chain units together as necessary to provide as many patch points as you need for your studio.

I recently upgraded my home recording setup to include a Yamaha 02R digital mixer and both Digidesign Pro Tools III and ADAT digital recorders. I am also evaluating a Sonic Solutions SonicStudio, and have a Sony DTC1000 DAT player and a Denon CD player as additional digital audio sources. So, my challenge was to be able to route sources to whichever destinations without having to crawl behind my racks and unplug cables. Could the Detangler be the answer to my problem?

FEATURES

Although available in various configurations (see the 'Pricing' box for more details), I was sent a z1616r Detangler (16 Ins. 16 Outs) for the purposes of this review. It's a black 19-inch, 1U rackmount unit with only an on/off switch on the front panel. The back panel features an IEC mains socket, four DB25 connectors for the digital audio inputs and outputs, and two DB9 connectors for RS422 In and Thru. The RS422 In socket can be connected to a remote control unit or to your personal computer; the RS422 Thru socket lets you link up multiple routers. I use a Power Mac computer, so Z Systems supplied their Digital Audio Crosspoint software to let me control the Detangler from my Macintosh. PC users will be pleased to hear that Windows software is also available.

The unit was supplied with four sets of DB25-to-XLR cable harnesses, with eight floating XLR plugs or sockets at the end of each harness to connect to the studio equipment. Two sets of these had female XLRs to connect to the outputs of the digital audio sources, while the other two sets had male XLRs to connect to the digital audio destinations. The manual points out that the pin-out connections on the DB25s are identical to those used by the Tascam DA88, and they claim that these are actually superior to the



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pros & cons Z Systems Detangler

FFOS

- · Computer-controllable.
- · Useful ontional remote control unit.
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cons

- . No power indicator on the front panel.
- . No front panel controls.

summary

The Detangler is an excellent router for AES/EBU dig tal audio signals, and convenient to control from a personal computer using the supplied software.



➤ Tascam ones, as they are fully AES/EBU-compliant. The same type of cable harnesses are also used by the Fostex RD8 and Sony PCM800 recorders. Usefully, the pin-out connections for the D825 connectors are provided with the unit, so you can make up your own cables if you prefer. A D89-to-DIN8 cable was also provided to connect the Detangler to the Mac's serial port and, again, pin-outs for both the In and the Thru D89 connectors were in the documentation.

The z1616r actually lets you hook up 16 AES/EBU stereo pairs, and its configuration is defined by a set of 16 'to/from' pairs. Each 'to' can have only one 'from' sent to it at any one time. This is self-evident if you think about it for a moment — the Detangler is a routing matrix, not a device that mixes digital audio signals together, as the Yamaha 02R does. So you simply connect up to 16 sources and destinations to the Detangler and then edit the 'to/from' pairs one at a time to achieve the routings you want. For instance, you could connect the output of a digital audio workstation (DAW) to the inputs of 16 DAT recorders at the same time to make 16 transfers simultaneously. Or you could send the output of one DAW to eight DAT recorders at the same time as sending the output of another DAW to another five DAT recorders and the output of an A/D converter to yet another three machines. And the Detangler is fully asynchronous — which means that multiple sample rates can be handled simultaneously — so some of your audio routings could be running at 44.1kHz while other routings could be running at 48kHz.

The optional remote controller for the z1616r lets you save and recall up to 15 different configurations, so that you can quickly switch to different setups for archiving the contents of a DAW to DAT, CD mastering, duplicating DATs, or whatever. These configurations are held in non-volatile RAM in the remote controller, so they'll be retained even with the power off. The z1616r itself also has non-volatile RAM, but this will only hold one configuration, always loaded on powerup. The remote control is a good choice if you don't have a computer to control the units or if you prefer to hit buttons and play with knobs (the Detangler has no front-panel controls). You can

use the remote to control up to four routers for larger setups, but the computer control software is a better choice here, as this lets you control up to 16 linked z1616r units, for instance.

SOFTWARE

Using the *Crosspoint* software, you type in the names of the various devices you have connected to whichever inputs and outputs on the Detangler; you can also add a detailed description of each device in a text window. Once you've named all your devices, you configure your routing patches in the patch window: two arrow buttons control which source device is sent to the destination device for each line in the routing window.

When a patch has been changed on the screen, it will no longer match the physical routing configuration in the z1616r, so the software highlights all the modified lines in red — to make them active, you simply click on a big 'Send To Router' button.

I needed to be able to use both the Pro Tools and the SonicStudio system I was evaluating with my Yamaha 02R — and I had just one 8-way AES/EBU interface installed on the 02R. Placing the Detangler between the two DAWs and the 02R interface allowed me to connect the 8-way interface from Pro Tools and the 4-way interface from the SonicStudio into the patchbay, and select whichever touting I wanted to and from the 02R. The 02R also has stereo digital outputs and 2-track digital inputs, and I could connect both my DAT and CD to its inputs using the Detangler, and still have plenty of room left to hook up a pair of PrismSound A/D and D/A units, an Aardverter A/D/A, a Genesis A/D/A, and a Manley D/A unit.

I set up my first patch to route the four pairs of O2R AES/EBU outputs to the four pairs of Pro Tools inputs, and was able to simultaneously route the first two pairs of O2R AES/EBU outputs to the two pairs of SonicStudio inputs. I chose to route the two pairs of SonicStudio outputs to the first two pairs of O2R inputs, and routed the second two pairs of Pro Tools outputs to the second two pairs of Pro Tools inputs. This way, I could use all the inputs to the two DAWs with all the outputs of the SonicStudio and two pairs of outputs from the Pro Tools — enough for many scenarios where I would be mixing most of my Pro Tools tracks internally.

To check out the various different D/A converters, I routed the 02R stereo outputs to the Prism, Aardverter and Genesis units. The Detangler was thus acting as a distribution amplifier to feed all the D/A converter inputs from the one source.

I routed a CD player directly to the Manley unit, while the output of the DAT was routed to the 2-track inputs of the 02R. It was then an easy matter to switch the output of any of the A/D converters through to the 02R or DAT, or even directly into Pro Tools or the SonicStudio system.

I could only route one set of A/D converters to any pair of inputs at any one time, but it was easy enough to switch the routings in the window to

PRICING

The Detangler is available in the following computer-controllable configurations:

- 288r (8 Ins, 8 Outs): £1263.13
- **1616**r (16 Ins, 16 Outs, as reviewed here): £1586.25
- z3232r (32 Ins, 32 Outs): £4694.13
- z6416r (64 Ins, 16 Outs): £5869.13
- m z6432r (64 Ins, 32 Outs): £7749.13
- z6448r (64 lns, 48 Outs): £9629.13
- z6464r (64 Ins, 64 Outs): £11509.13
- Mac software and cable: £141
- PC Windows software, cable and interface; £229.13

- 279816 remote control for z8 and z16: £411.25
- zrd3264 remote control for z32 and z64: £616.88

The z88 is also available in alternative configurations:

- z88e (all XLR AES/EBU connectors): £1051.63
- z88c (four XLR AES/EBU connectors two BNC connectors for S/PDIF, and two optical connectors): £1169.13
- z88custom (not computer-controllable, but available with any combination of connectors): £1439.38

feed the 02R from each converter in turn, by clicking on the buttons in the routing patch window. The result was near-total flexibility for routing the digital audio signals around my project studio!

CONCLUSION

The z1616r proved to be an almost perfect solution for my project studio. At first, I thought I might need a 32 x 32 matrix, but it turned out that 16 x 16 was just about the right number. In the not-too-distant future I'm intending to add some digital outboard units, such as a Lexicon PCM80 or a TC Electronics Finalizer, and will almost certainly want to use various other units with digital outputs, so I'll probably have to add a second 16-way Detangler at some stage. Still, it's great to be able to hook up extra units in this way as my needs develop.

One minor drawback is that there's no power indicator light on the front panel, and I sorely missed this when wiring up, as I needed to check whether the power cable was working or not — the only way to do this was to boot up the software on the computer and see if it recognised that the hardware was switched on. My Sony DAT and Denon CD players had no AES/EBU connectors, so I was unable to wire these into the patchbay. I'm now planning to get a Tascam DA30 and a CD player with AES/EBU outputs so I can hook these up to complete my rig.

It would be very useful to have an option to add some S/PDIF and optical connections to the z1616r — which is possible with a custom version of the basic 8-way router available from Z Systems.

I still needed some more patching equipment so that I could route the same analogue source into the various A/D converters I was testing, using a distribution amplifier or automated patchbay. And I also needed to be able to switch the analogue outputs of the D/A converters to route to the analogue inputs of my monitoring amplifier so that I could compare converters. I'm not aware of any currently available off-the-shelf units that provide these capabilities, and found myself wondering whether Z Systems might consider making such a device — with me as their first customer!

See separate 'Pricing' box.

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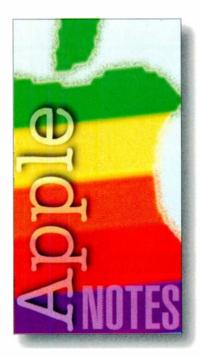
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MARTIN RUSS feels the need for speed, and reminds readers of the often overlooked benefits of using macros...

ne of the things that's always annoyed me about modern computers is their inability to carry out repetitive tasks. In the days when you had to program a computer by issuing instructions via a teletype, or punched paper tape or cards, a little bit of programming would enable easy repetition of a calculation. But when you're faced with a mouse and menus, getting the computer to repeat even simple tasks can become a tedious and difficult feat of manual dexterity. Many sequencers suffer from this problem. I've often wondered why very few programs have a 'repeat last command' button, because I must have spent a large proportion of my time at the QWERTY

keyboard repeating and then undoing (there is always an Undo key, of course!).

So, after a particularly onerous set of transpose dialogue boxes in my sequencer — Select notes, Command T, Return, Select different notes, Command T, Return, and so on — I decided that now was the time to look at automating things a little. A quick

search through my cover-CD festooned Mac magazine collection provided a shareware program and a review of a commercial alternative (*QuicKeys*). The shareware 'macro' program I found was KeyQuencer 1.2, and although it has now been replaced by a 'Lite' shareware version of the commercial KeyQuencer version 2.0 (and up), it shows that you can get considerable power for not very much money. It allows you to assemble a series of commands, and assign them to a single key-press. The only catch is that, unlike the more expensive commercial key recorders, KeyQuencer requires you to do some scripting — but since you probably know what key-presses you want to make, this isn't so difficult. And there are a host of special functions included in the scripting language to help you achieve things that aren't just a simple mouse-click or key-press away.

KeyQuencer 1.2 uses a remarkably small amount of my Mac's RAM, and it has been completely stable for over a month of hard usage. Learning how to script it wasn't very hard — the first macro that I produced did nothing more than reduce the 'Command T, Return' sequence I was using to open a dialogue box, and then close it, to a single press of a function key. Once I had the dialogue box set up to do the transposition, I could whizz along with the mouse, selecting the notes, hit F3, grab some more notes, hit F3, and so on. When I discovered that pressing the Tab key moved the cursor around in dialogue boxes, it wasn't long before I was writing macros to select the top line out of a track, or hocket notes in time. These are all things that I do frequently, and I had always wished that there was some way



Binary Software's KeyQuencer macro generation program.

of automating them...

At the risk of becoming a shareware evangelist, let me say that *KeyQuencer* is yet another wonderfully useful piece of software that doesn't cost the earth, yet can increase your productivity hugely. Even more important, when you aren't gnashing your teeth because you're repeating long, arcane and tedious sequences of key-presses, your creativity improves. I'm sure there are lots of sequencer users out there whose lives could be improved by it.

You'll find *KeyQuencer* at: http://www.binarysoft.com/kqmac/ and *QuicKeys* at: http://www.cesoft.com.

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HARD WORK

There's no doubt that hard disks are continuing their headlong plunge in price, despite their increasing capacities. 2Gb for under £400 is no longer quite the bargain it was this time last year. But there's a hidden casualty when you use these large disks — your files!

I bet you thought that if a file had 200 bytes of data in it, it would be stored as a file with a length of 200 bytes, perhaps with a few extra bytes tagged

on. And you would be wrong. In fact, ludicrous though it sounds, there is a limit on the minimum size of a file — and it changes depending on the size of the hard disk you store it on!

For my smallest hard disk, a mere 15Mb, the smallest file size is 1K. This sounds OK until you examine the actual contents of a file. Saving a letter 'a' in a plain text file on the disk produced a file whose contents were a

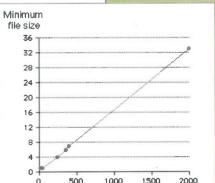
mere two bytes, but whose actual size was more than 500 times bigger! On my largest hard disk (a 2Gb AV drive), things are even worse — a minimum file size of 33K. Storing several small files on a large hard disk is often nothing more than throwing away useful space and filling it with padding.

If you're wondering, the formula works out at something like:

Minimum file size = Hard disk size x 0.166

Where the file size is in kilobytes, and the hard disk size is in megabytes. The significance of this formula depends on the typical size of the files that you work with. If you use a digital audio hard disk recorder system, you may well have lots of large files, and the wastage on a 'gig' hard disk will be minimal. But if you produce lots of small MIDI files, utility programmes, MAX scripts, or tiny 'READ ME' files, you may be expending large amounts of hard disk space to store only a comparatively small number of bytes.

One solution to this is to buy more hard disk space and accept that for smaller files, significant amounts will be wasted. But a much neater solution is to partition (split) a single large hard disk into several smaller ones by using special formatting software. Choosing the partition size to suit the expected file size isn't difficult. For example, if your files are around 100K, partitioning a disk into several 'project' named areas of about a CD's capacity (650Mb) will give minimum file sizes of around 10K — so the average wastage is going to be only about 10%. For tiny text and MIDI files, even smaller partitions may be better.



Hard disk size



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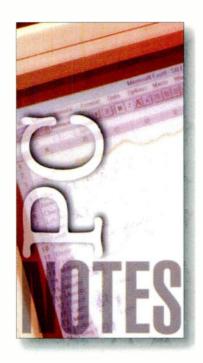


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This month's clutch of software and hardware problems are mainly of the SCSI variety. MARTIN WALKER deactivates a few suspect devices.

his month I have discovered a lot more about possible problems when attempting to install new SCSI devices. The beauty of SCSI is that you can keep adding devices up to a maximum of seven per host adaptor card (which is the eighth device on the chain), or 15 plus host adaptor for Wide SCSI. As far as the SCSI chain is concerned, there should be no difference between internal and external devices, so it ought to be possible to access an internal device from an external controlling device such as a sampler (as long as you turn off any polling from the PC, such as auto insert notification, which would interrupt the sampler during its accesses).

This approach would enable you to install the cheaper internal model Jaz drive inside your PC, but also access it (with a different cartridge) Figure 1:
This diagram, taken from the excellent SCSI
Tutor provided with Adaptec's EZ-SCSI program suite, shows how the host adaptor ends up in the middle of the SCSI chain when you're using both internal and external devices.



for sampler use, or do what I was trying to do this month — add a TEAC CD516S internal SCSI CD-ROM drive, for use both by the PC, and by my Akai sampler with sample CDs. Apart from the cost saving, this route leaves one less noisy cooling fan in the studio, since internal models are cooled by the existing PC fan system. The idea is that, since SCSI is a standard, there are no conflicts, and installation is just a matter of setting an appropriate ID number, and

connecting the power and data cables. It seemed such a good idea at the time!

Every device must have a unique identity number; during the bootup procedure, each of these numbers is polled by the host adaptor, to find out what's currently connected. Each SCSI ID has a priority: 0 the lowest, and 7 the highest; the host adaptor itself is normally assigned ID7, to make sure it remains in charge. At each end of the chain, the SCSI buss must be terminated, to prevent reflected signals bouncing back down the cable and causing problems.

If you are solely using external devices, then the host adaptor will be terminated, as well as the final device on the external chain. If you only have internal devices (inside the PC), such as a SCSI hard drive and CD-ROM, then the host adaptor must still be terminated, as well as the final device on the internal chain. If you have both internal and external devices, then the built-in terminations must be removed from the host adaptor, since this is now somewhere in the middle of the chain, and the two new end devices must both be terminated (see Figure 1 above).

After removing the small resistor termination

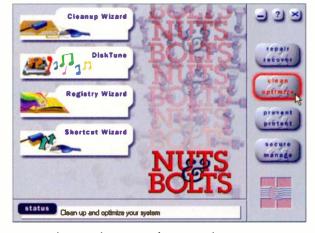


Figure 2: The main selection screen for Nuts & Bolts.

blocks from my host adaptor card, I attached the new CD-ROM drive to a convenient spare power cable inside the PC, connected the ribbon data cable between the back of the drive and the socket on the host adaptor card, and then rebooted. The PC got part way through the startup and then crashed, in the same place, every time I rebooted. Going into Safe Mode showed the same bizarre scenario that I reported in last month's PC Notes — the Device Manager showing multiple instances of the same hardware. Last time this happened was after I installed an update to EZ-SCSI, and although I recovered by re-installing Windows 95 in the end, this fresh attack suggested a SCSI hardware problem, rather than a software

I subsequently discovered that the CD-ROM drive worked fine, but only if I left my external

TINY TIPS

Here's the solution to another SCSI problem that you may come across when attaching computers to samplers and synths with their own internal drives and SCSI controllers (the Kurzweil K2000 series, for instance). If you find that the Device Manager in your PC shows seven hard drives (or CD-ROMs) when you only have one, the problem is probably caused by another device having

the same SCSI ID, 7, as the internal host adaptor card. If this is the case, each time the SCSI buss is interrogated during the bootup procedure, phantom devices will be found at other IDs. Simply change one of the IDs so that all are unique (most PC adaptor cards can be altered easily), and the next time you boot up, all of your ghostly drives should have disappeared. Finally, two tiny tips for those with yet more SCSI problems. Using the

same make of SCSI cable throughout may help solve problems, since its impedance values will remain more constant; although there are mixed thoughts on this, SCSI ribbon cable is said to sometimes perform better, since each core of the cable will have an earth wire running next to it (shielded cable often only has a single earth surrounding all of the cores). Having said this, finding external ribbon SCSI cables to try may prove more difficult.

SCSI Syquest drive switched off when first booting the PC. Normally when obscure things like this happen with SCSI chains, the advice is to remove devices one by one (by powering them down before rebooting the PC) to identify the culprit, and then move it elsewhere on the chain, or change the length of the SCSI cable connecting it to the rest of the system. In my case, the CD-ROM drive was fixed at the end of the chain, as the only internal device, so I had to try moving other devices.

Removing my Akai sampler and two-metre SCSI cable from one end of the chain, and substituting them with a termination, proved fruitful. Now I had both Syquest drive and CD-ROM recognised by the PC. I reconnected the Akai to the Syguest drive with a one-metre cable — the chain was now Akai (terminated). one-metre cable, Syquest, two-metre cable, PC host adaptor, internal ribbon cable, CD-ROM (terminated) — and the PC crashed again. Finally, bowing to other people's exhortations to break the rules, I removed the jumper termination from the internal CD-ROM drive, leaving the SCSI chain completely unterminated internally. Everything worked fine on the next boot, and it was only after this that I discovered that the tiny jumper on the CD-ROM worked the opposite way round to any other termination I've ever seen - with the jumper in place, there was no termination. and when it was removed, the termination was added. The moral of this tale? Never assume anything where computers are concerned! And if you get peculiar SCSI problems, stick with them — there may yet be a logical explanation

However, the Akai sampler now gave hard disk read errors with the Syquest, which it hadn't done before. Returning the cables to their original positions — Akai (terminated), two-metre cable, Syquest, one-metre cable, PC host adaptor, internal ribbon cable, CD-ROM (terminated) sorted this problem out. The sad thing is that, after all this rigmarole, the CD-ROM drive never did work reliably with the Akai. There's no disgrace in this, since it tends to be the Akai that's temperamental, but it does seem that 4x speed CD-ROM drives are about the fastest that work reliably with Akai samplers. Unless anyone knows better?

NUTS & BOLTS

Yet another utility package arrived for review this month — *Nuts & Bolts*, from Helix Software, distributed in the UK and Europe by Crossatlantic Software. This seems to be a direct competitor to *Norton Utilities*, but offers (as always) even more comprehensive and far-reaching components. These are provided in four main areas. The Repair & Recover section includes DiskMinder (disk diagnostics and repairs), Image/Restore (saves critical disk information in case of future crashes), Rescue (creates a single floppy recovery disk if you get hard disk problems), and Discover (a whole host of useful diagnostics for advanced users). Clean

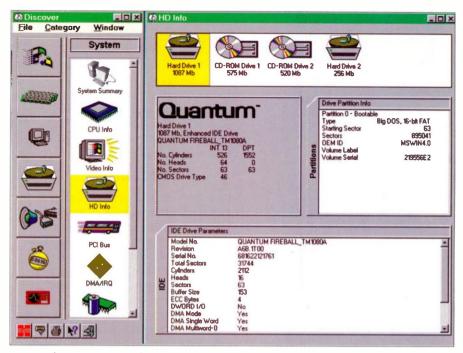


Figure 3: The Discover portion of Nuts & Bolts in action, showing the amount of information that it discovered about my storage devices. If everyone had this utility, sequencer helplines would have a much easier life,

& Optimise includes Cleanup Wizard (disposes of unneeded or unused files), DiskTune (a drive defragmenter that's even more comprehensive than that of the Norton suite), Shortcut Wizard (checks all of your shortcuts for missing files), and Registry Wizard. This one intrigued me, since besides the more usual options to backup and restore, clean up unused references, and repair internal references, it also offers a tune-up of your entire Registry, rebuilding it from the ground up, stripping out unneeded entries, and re-ordering everything, much as a hard disk optimisation would. Crossing my fingers and taking a deep breath, I tried it, and ended up with a 23% size reduction in both Registry files — and I've yet to find any subsequent problems. Prevent & Protect includes Bomb Shelter (a 'crash catcher'), Winguage (multiple monitors of system resource usage), Virus Scan, and TrashGuard (protects against accidental deletes). The final section, Secure & Manage, includes EZ Setup (a bit like TweakUI), LaunchPad (easy one-click start to any applications), Stronghold (file encryption and password protection), Shredder (security wiping of sensitive deleted files), and Zip Manager (compression and expansion of archives).

The whole package is most ambitious, and is claimed to run faster and deal with problems at a deeper level than many competing products. This is one of the most comprehensive utility suites I've seen, and it manages quite a bit that others don't, correctly reporting, for instance, all of my hard drive details (see screenshot), as well as providing very useful benchmark tests for checking the performance of components in your system. However, I did manage to crash my PC on several occasions in consistent ways. I reported my findings to Crossatlantic software, who suggested running the same scenario in Safe Mode, which unfortunately changed little.

Having said all this, this package is still staying in my machine, because what it does well, it does extremely well. Once these small problems have been ironed out, it will be a product to be reckoned with. *Nuts & Bolts* costs around £40 inc VAT. Contact Crossatlantic Software on 0171 228 7036.

PROBLEM CORNER

Those of you who read my 'Bottleneck Blues' feature in the August issue already know that certain components of a PC can stop you achieving maximum performance when you're HD recording, even though they work fine in most other applications. Now something else is conspiring to cause problems — the drivers used by some graphics cards. The problem (as always) is anything that tries to be clever by doing something different to attempt to save time overall, resulting in a hiccup in the audio, which would be far happier just plodding along at its own pace. The writers of some PCI graphics card drivers have hit on the idea that they can get better instantaneous performance by locking up the PCI buss until their screen updates have been completed. Of course, this makes the drivers faster, but if you happen to be reading or writing sample data, any lockup longer than 1/88200 of a second (1 byte of a complete 16-bit word running at 44.1kHz) will result in an audible glitch.

You can test your system by playing a WAV file from any application using a small window (not maximised). Start playback, and then repeatedly grab the title bar of the application, drag the window and drop it somewhere else on screen. If you get glitches and pops, or the left and right channels get swapped, you have a graphics driver with a problem. Apparently, many manufacturers, including Matrox and Tseng, have been made aware of the problem caused for musicians, and there are fixes available. Many thanks to Greg Hanssen of Zefiro Acoustics for helping to publicise this problem. You can find out more on their web site (http://www.zefiro.com/).



The ST platform is still plentifully supplied with cheap and cheerful music programs. **DEREK JOHNSON delivers an** update.

oodmans' recently released Atari Reference Guide Public Domain and shareware list has received its first update, and it includes a good collection of new and updated programming tools, games, fonts and clip art. On the music front, sadly, there's little included: disk number GD2984 contains a new version of System Audio Manager, a utility that allows digitised sound files to be attached to system events (such as opening a window); SAM also offers basic record, playback and editing features. In addition, the disk contains N Play, a simple sample player which recognises several sample file types, including SAM, DVS and WAV.

Most of the update lists the contents of a hoard of cover disks left over from American magazine STart which Goodmans recently discovered; some are 10 years old, but contain a good selection of programs. Stocks are reasonably plentiful but ultimately limited, and disks can be yours for the usual catalogue price (£1.50, or £1.25 for subscribers). Musical items

can be found on several disks (for example, there's Guitar Solo, Ear Trainer and MIDI data display program MIDI View. To recap, an annual subscription to the Guide costs £15 in the UK (£20 Europe, £30 other countries). Contact Goodman's, 16 Conrad Close, Meir Hay, Longton, Stoke-on-Trent, Staffs ST3 1SW. (Tel: 01782 335650. Fax: 01782 316132. Email: goodmans@mcmail.com).

MOOS FLASH!

While I've heard rumblings about some of Electronic Cow's software being ported to the PC at some point in the future, their ST programs are still being enthusiastically supported. First of all, granular synthesis package Snippit Synth is now at v1.1; as well as using the usual waveform grains (square, sine, triangle, and sawtooth), any mono AVR sample (as created by Microsoft's Replay 16 sampling package) can be used as the basis of a user wavetable. A sample's first 20K is used, and interpolated depending on the settings made in the frequency section. The results are often quite strange, but the original

sound is discernible when lower frequencies are used. Auto-crop and optimise volume tools have been added, so that sounds can be better prepared for sample dumping or exporting. It's also now possible to copy the settings made from one chunk to another, which makes it easier to

synthesize sounds from multiple chunks. The sample dump routines are now slightly faster, and a driver has been added for the

Akai's \$900 and 950 that automatically converts samples to 12-bit. Extra sampling rates, 16-bit playback and waveform-draw colour options have been added to the Falcon version, and all versions now benefit from four different waveform draw modes. And that's not all: v1.15 (to be unveiled at the Atari shows in October, see box below) will feature AIFF and raw sample data loading, import for user wavetable grains, better input controls (including editable text fields and bigger sliders) plus the ability to mix or modulate chunks and arrange them sequentially in a sound.

1 sample

1 HIDI

MIDI Arpeggiator v2.1 should be available as you read this, and features a new pattern play mode; tracks are now 64 notes long, divided up into four 16-note patterns which can be cycled



Electronic Cow's MIDI Arpeggiator...

in various ways. In the cycle modes, and with random play set, after the amount of notes determined by the locators MIDI Arpeggiator moves on to the next pattern (and plays this randomly). Left and right locators replace the 'steps' setting, so patterns can be played from an offset step — from step 4 to 11, or 8 to 16, and so on. The look and feel of the mixer controls have been improved: the dials have a greater resolution with faster re-drawing (and animation on the Falcon). By pushing the Shift



key, you can now increment values in larger steps. The duophonic part now has a channel strip, including pan,

volume, and two user-programmable dials, plus independently set controller buttons for each auxiliary, giving you greater control. Lastly, there are improvements in the MIDI File export option (both Type 1 and 0).

Snippit Synth costs £16 plus £1.50 p&p; MIDI Arpeggiator is £15 plus p&p. Upgrades are free to registered users, though original disk(s) must be returned, with a suitable stampedaddressed envelope, to Electronic Cow; arrangements can be made to upgrade via email. Electronic Cow can be contacted at 350 Broadwater Crescent, Stevenage, Herts SG2 8EZ. (Tel: 01426 281347. Email: electronic_cow@dial.pipex.com. Internet: http://dspace.dial.pipex.com/town/terrace/abi91 /cownet.htm.)

Incidentally, American readers can now buy Electronic Cow software domestically; the US distributor is Systems For Tomorrow, PO Box 3034, Independence, MO 64055, USA. (Tel: 800 875 4943 (orders only) or 816 833 4738. Fax: 816 252 3611. Email: sales@SystemsForTomorrow.com. Internet: http://www.SystemsForTomorrow.com). Prices should be \$19.99 for Sound Chip Synth, \$27.99 for MIDI Arpeggiator and \$29.99 for Snippit Synth, all plus postage.

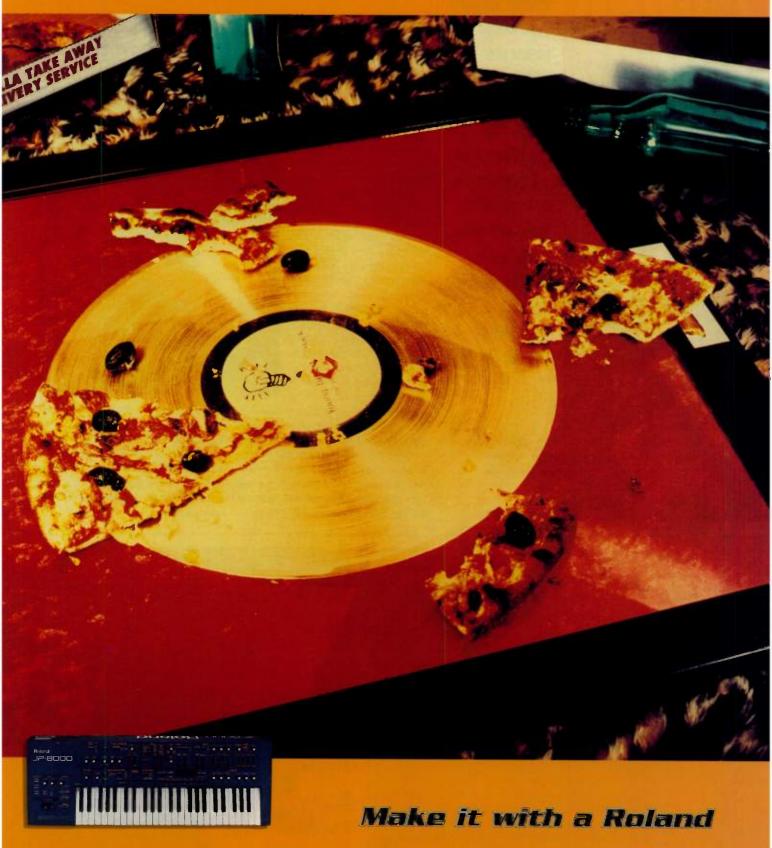
SHOW BUSINESS

Goodman's PD have been in touch to let us know that, following the success of their last two Atari shows, there will be another two shows held over the weekend of October 18 and 19. The venues remain the same as previous Atari shows: on Saturday, October 18, it's the Birmingham Motorcycle Museum, and on Sunday, October 19, it's the Osterley Hotel in Isleworth, London. Both shows run from 10am to 5pm, and admission is £5 (or £3 after 2pm); under 16s can get in for £1 all day, and special family deals are available. Expected exhibitors (though not necessarily for both shows) include Goodman's, System Solutions, Titan Designs, The Upgrade Shop, Console Centre, FaST Club, HiSoft UK, Club 16/32, Portfolio Club, Calamus User, Atari Computing, Sunrise Audio, Floppyshop, Best Electronics, Electronic Cow (who will be launching some new software), and various disk mags and user groups.

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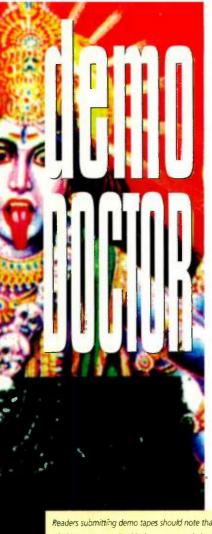
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If you'd like our resident specialist **JOHN HARRIS to** review your demo tape, just send it on cassette or DAT, with recording details and a photograph, to: Demo Doctor. Sound On Sound, Media House. Trafalgar Way, Bar Hill, Cambridge CB3 8SQ.

Readers submitting demo tapes should note that SOS regards the inclusion of photos or artwork with demos as permission for the magazine to reproduce this material free of charge, as illustration, with any review of the accompanying tape.

......

MICKEY DOWN UNDER

Recording Venue: Home.

Recording Equipment: Atari running Steinberg Cubase, Boss mixer, Akai \$900.

A strange name for a band, but as the group in guestion hail from Malmö in Sweden, I think we can let it pass. The titles of the songs speak for themselves: 'I Need A Brain', 'Dark Pop' and 'Are You Hip Enough?'. Complete the picture with a

photograph of a pouting blonde and a tall bloke with a Britpop hairstyle and you can probably make a guess at the style of music. Yet the equipment list sows some seeds of doubt — not a guitar in sight... And so into the brash four-on-the-floor of 'I Need A Brain', which leans heavily towards hardcore techno. The synth sounds are initially a bit thin, but it seems that the bass end has been mixed too low for the track. A remix would certainly bring the power back into an otherwise quite exciting sound.

'Dark Pop' begins with an upfront kick drum and echoed claps which are then joined by a backwards-sounding synth and clattering low-bandwidth hats. The formula is once again only 90 percent there because of the lack of any bass. Even as the track develops in the upper mids with the addition of rasping snare and extra synth

loops you keep waiting for the bass to start, but it never really seems to happen. Some vocal samples would also have been welcome, to break up the long arrangement.

Finally, 'Are You Hip Enough?' starts with some exciting industrial-style noises and a clever bit of drum programming with the occasional dropped beat. This is



more like it — the bass is even mixed a bit louder on this track too, although it's still not quite at its devastating best. A few decibels cut at 6kHz will help prevent serious ear damage when it's played at high levels, but otherwise this is a track that has most of the right elements of industrial techno.

MATT JOHNSON

Recording Venue: Home.

Recording Equipment: Fostex DMT8 digital 8-track, Lexicon Alex and Alesis Quadraverb effects, Drawmer LX20 compressor, AKG 451, Shure SM58 and Neumann U89 mics, ART Valve mic preamp, Atari 1040 running Virtuoso software, Akai \$950 sampler, Sany DAT.

No, not the Matt Johnson from The The, as he's quick to point out in his letter. This Matt Johnson's debut CD has been inspired by the Beach Boys' Pet

> Sounds, which accounts for the cover of 'That's Not Me' from that album. This demo also features a lot of cut-up samples and loops, as Matt was trying to get away from his keyboard-playing roots, which he felt would give the game away on his influences. Still, having openly admitted a fondness for the Beach Boys, he's rather done that!

> The opener, 'Cabbage In The Wet Suit', has an expansive stereo sound with what sounds like a well-known John Bonham sample providing a heavy groove to drive the song along. Undoubtedly the

work of a muso — Matt can't hide this fact, and the playing and choice of samples are excellent. The result is a kind of pastiche of many sorts of musicians playing. There's some discrepancy between the drum sample (very live) and the upfront nature of the rest of the mix, which makes it sound uneasy. Matt acknowledges that he was not completely happy with this mix, but I think the

only way around this would have been to change the drum sounds - the sample is over-used anyway.

The second track has a more homogeneous sound, with a warm, sexy bass line on the verses which breezes into the sort of chorus that Bowie would be writing if he was into

club mixes at the moment. Sub-bass provides a large sonic slice of the mix without becoming overbearing, and the drum samples have been superbly chosen and programmed to occupy the

frequency area above them. I particularly liked the use of hot shot hit samples rather than sticks on the snare, which helped give it a lazy, relaxed

Despite being heavily sequencer-orientated, the album features some well-recorded real instruments. The acoustic guitar and saxophone on 'As Lonely As You Are' in particular stand out

for me. This track has shades of Prince (vocal), Thomas Dolby (highresonance filter synth) and Steely Dan (sax) but manages to sound like something completely new.

This is one of those albums you could definitely get to love on repeated plays and it seems obvious to me that a lot of hard work has gone into the songwriting and the excellent production. The singing is also of a high standard and, of course, those backing vocal

arrangements have to be mentioned. Definitely an album that large record labels will fail to pick up on, but I hope a smaller label will give a chance to a deserving cause.



BEDSIT MENAGERIE

JEREMY TURNER

Recording Venue: Home.

Recording Equipment: Details not included.

A previous patient of the Demo Doctor, Jeremy has returned for another going-over in the column. In common with most people who send out tapes, he's not had much luck sending out demos to companies and asks for some recommendations of people who would like his style of electroorganic music. Strangely enough, I was talking to a friend about this just the other day, and we agreed that you have to target companies whose style you like. Even if this means that you're only sending to a few companies who turn out the sort of albums you like, it's worth sitting down and doing a little research — we both know of instances where such an approach has worked out.

Jeremy's music is a kind of trance dance, but the looped sequences are too far forward in the mix to allow you to sink into that state. I would recommend dropping their level and moulding them to the backing with more use of echo and modulation. Having said that, you have to be careful: there's a fine line between hitting it just right and chucking

too much delay on the track. I can hear in the mixes that Jeremy already uses echo well, but he's tending to use it on looped synth parts a lot, which can make the main kick and snare parts sound a little dry and upfront. I can also hear — particularly on the second composition, 'Sting 2' — that he's got some good in-tempo echo effects on the occasional kick and snare hit, but this doesn't seem quite enough to meld them with the backing. So the separation of the recording is good, but that's not always what you're after with this kind of music.

On a more positive note, the music is well put together, with a warm sub-bass end and plenty of good musical ideas to keep the dance feel without losing the vibe as new sections are added. The tape lacks presence, but this omission of high frequencies gives it a dark, earthy feel. I tried adding some 12kHz with my desk EQ but this didn't really improve the overall sound enough. The drum sounds, however, are a little wearing after a while, with a predominance of fairly boxy samples strong in the 800Hz-1kHz range; some variation would have been welcome. \Box

JUAN MICO

Recording Venue: Home.

Recording Equipment: Power Mac running Steinberg's Cubase, Yamaha AM802 mixer, Alesis RA100 amp, Menitor One speakers and Microverb III and Quadraverb Plus effects, Sony DTC60ES DAT.

Juan says his roots are in rock, but he switched to electronics in the early '90s, partly because they 'didn't question' his ideas but also, I suspect, because of his growing interest in computers.

The first instrumental composition features a crisp, but never harsh, mix that sounded great on my new Spendor monitors. The bass line is pretty minimal, using only A flat to F, but is rhythmically very hypnotic. The sound is deep but mellow, and Juan uses pitch-bend, or possibly even a light portamento, to slide from one note to another. On the percussive side, a lightweight, bright-sounding snare is given a short reverb and a touch of backwards reverb every time a couple of bars roll over. This all helps the rhythmic interest, and the

kick drum sticks to the bass line as if it's been super-glued there. Melodically, looped bells take the high ground and fat brass/string combination pads glue the rest of the soundscape together.

Interestingly, the second instrumental is an electronic version of a piece of music by Canadian metal band Voivod, who I confess I've never heard of. This is exceptionally well put together, but couldn't possibly make it onto the dance floor because of all the tempo and rhythmic changes — a sort of Tomita meets a Rush/Motorhead combination!

Sonically there's nothing to criticise on this demo. The high frequencies are clear, the bass and kick work hand in hand both musically and in terms of frequencies; nothing is abrasive or jumps out of the mix. Juan's got it all under control and it would be nice if he could get some more writing done next year!

COOKIE B

Recording Venue: Home.

Recording Equipment: Spirit Folio Mixing Desk, Atari Mega 4 running Steinberg Cubase, LA Audio compressor, XRI SMPTE unit, Spirit Absolute 2 monitors, AKG C1000 mic, Tascam DA20 DAT, Digitech Quad effects, SPL Vitalizer.

I reviewed Cookie B a while ago under the name Paul Cook and since then he has decided that the best way forward is to start his own label and try to break into the club scene independently of major labels. Like most people, he's received little encouragement from larger operations and is going it alone, even starting a small studio business from his home, which offers recording tuition as well as

recording facilities.

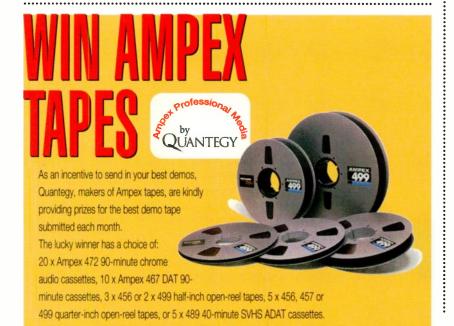


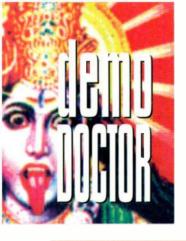
In my last review I mentioned that the vocals sounded a bit too dry for the music, and Paul has taken the criticism on board and

adjusted the vocal sound in the mix. I'm glad to hear that he hasn't gone from one extreme to the other: the reverb chosen on the first track is short and subtle. The idea is to give the vocal a bit of space as opposed to smothering the vocal mix in reverb. As the backing is dry, it also gives the vocal a place in the mix.

Another problem last time was a rather heavy dance snare, and again the suggestion of lightening this up has been taken on. Consequently the mix does show improvement, with all the sounds sitting well in the aural picture. As for the production, the first two songs are pretty standard dance with female vocals, and Paul seems to be doing everything right. All he needs now is a touch of flair, perhaps in the use of effects, or an additional part or sample that gives a special touch to a solidly produced backing.

The final track is a techno workout which Paul intends to use to break into the club scene, and the opening phrase is certainly an attention-grabber. I liked the way that the tail end of the phrase worked with the echo and also the reverbed echo effect, which made the sound larger in an otherwise minimal mix. Some of the sounds could be fatter and more analogue-sounding, and the bass end seemed low on my speakers, but I'm really splitting hairs here. \square

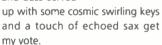




QUICKIES

STEF GOODCHILD: Despite including no information about the recording, Stef's demo impressed me enough to get into the Quickies column. The low-frequency end of the demo is clear but effectively sub-bass enough to do the trick in this arty jazz/dance style of music. Borrowing elements of drum and bass and turning them into something softer by using less aggressive sounds makes the first track very laid-back, in a nice way.

There's also a well-chosen trumpet sample to hold the interest when the spoken vocal drops out. The jazz edge is held for some of the later tracks, such as the vaguely Eastern 'New Tattoo', but the mellow drums and bass served



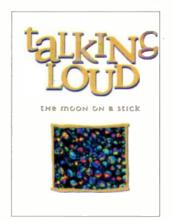
SELENA LEON has a strong, controlled voice which she puts to good use on the single song on this demo; the recorded quality of the voice is of a high standard, with only some sibilance audible as a result of overcooking the levels to the cassette. Country rock still has a big following and this song doesn't really tax Selena at all, but that easy style is what's required of the genre. Harmonies are nicely placed on verses and choruses in a classically arranged song with a strong middle eight. My only criticism of the production is the lack of feel in the programmed bass and drums, which sound very static compared with the real thing. Possibly some better samples with a variety of snare hits would improve things and, yes, it would be nice to hear a real bass guitar on the track.

PRETTY IN BLUE: In a sea of echo and reverb, the vocals of 'leather' Lisa sit awash in the first song on the tape. In this instance the huge amount of effect actually suits the mix: heavily echoed guitar occasionally pokes its head out of the keyboard pad and a drum loop backs it all up. On the second track it's all too much, and the vocal should really be up at the front with the occasional echoed phrase. The drum track is interesting, though, and I definitely recognise a Shooglenifty drum loop sampled from their Venus In Tweeds album, albeit cunningly disguised with a triggered drum part. Given the limitations of the recording equipment the pair have done well, but remember that delay is like another instrument added to a mix. and you should really consider its impact before just adding loads of it.

TALKING LOUD started life as a cover band and proved very

successful, winning the best cover band category in a regional competition. Since then they have decided to write their own material too, in the same kind of style as their influences. The resulting demo is intended to be released as a CD for them to sell at gigs, and opens with a strong song entitled

'Tomorrow'. It's very much a keyboard-orientated sound with a retro early '80s feel, complete with sneezing electronic snare, analogue-ish keyboard sounds and angst-filled English vocals. The second song even features an octave bouncing bass line with a lovely warm sound and slightly buzzy edge



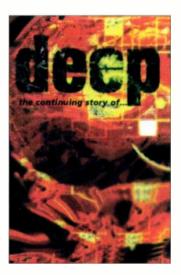
— classic stuff! All this they do very well indeed without once pandering to the more modern dance beats, with the result that it sounds quite fresh. Perhaps it's time for another retro revival in the pop industry.

DEEP: Once again a lack of recording details prevents a fine demo from getting a better review. I'm assuming that guitarist Rik Oliver is also the lead vocalist when I say that he has the closest vocal style I've heard to Squeeze for some time. The songs are obviously influenced by this era of pop music too, with excellent harmonies and guitar sounds thrown in for good measure. It's interesting that they've included a six-minute edited version of all the songs on side A of the cassette and all the full-length mixes on side B. The mega-mix works well and for a while I thought I was listening to just one cleverly played song (thank God there were some sleeve notes!). Rifferama in good old Paul Weller style also comes to the fore on this demo, and it's rather well recorded, without too much in the way of effects muddying up the sound or smoothing out the raw edge. On the strength of the songs, ably helped by the recording, this demo should definitely get them some interest from record companies.

JOHN CROSS is hoping to get some record-company interest in his new material after coming very close to success in 1995. However, I don't think his vocal performances are doing his fine songs any justice. For example, if you write a song called 'Living On The Edge' and then sing it in a lacklustre fashion, surely something's not right? Unfortunately, the lack of vocal expression holds true for the rest of the songs too -I can't understand why the producer didn't point this out during the recording session. On a more positive note, the songs themselves, the production (vocals excepted) and the mixes are professionally handled. Perhaps the way forward for John is to try to get a publishing deal.

ALAN WHITE: An impressive demo from Newcastle-based Alan White, featuring a classic '60s and '70s style of songwriting. The songs are epic in structure and ooze backing vocals and catchy choruses. Where there would usually be strings, pad keyboards take on the role, and the drums are programmed instead of played. Sonically some of the sounds, such as the toms, have a digital

crunch, but this is more than made up for by the real instruments — the saxophone playing of Gordon MacRae on 'Living In The Night', for instance. The big chordal keyboard sounds give the recording that large stereo spread and these are well done, particularly on the second



song, which is exceptionally well mixed and performed. Alan also has a good voice, admirably backed by Lynn White on 'Back To The Water' and other tracks. Curiously, all the songs sound as if you've heard them before and, even more curiously, a lot of them sound like singles.

WL THOMPSON: The mysterious WL Thompson sent absolutely zip apart from an SAE with this demo. which makes the recording standard a little hard to assess. However, I can reveal that the first track on the demo has all the hallmarks of a dance/funk cross with a fine vocal performance, house-style piano and a brass section placed high in the mix. One suggestion for improving the mix would be to thin the brass by either rolling some bass off the sample, adding some 6kHz for cut, or trying a small amount of both to taste. The second song moves towards soul, but is hampered by the level of the bass drum in the mix - it's just far too loud, with a complex rhythm that doesn't suit the groove. I can see it working lower in the mix, squashed by a hefty amount of compression. The vocals are also a bit muddy on this track, with a touch of distortion right at the end of the song, but I can hear that they are well performed. Overall, WL should watch out for overcooking the bass end of the mix and improve the vocal clarity, possibly by using a better vocal mic.





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brief encounters

CONCISE REVIEWS OF ESSENTIAL ACCESSORIES

KELSEY ACOUSTICS PATCHBAY

Low-cost patchbays are pretty much commodity items nowadays, and ever since P&R figured out a way to get 24 pairs of standard jack sockets in a 1U panel, just about every other company has come up with its own interpretation of the same idea. The Kelsey Acoustics Patchbay, manufactured for them by Rean (a major plastics company who also make jack sockets), is no exception, though it does have a couple of interesting new features. The basic patchbay comprises a folded metal chassis into which individual circuit boards containing the sockets are slotted. If you reverse the boards, which have sockets front and rear, the front-panel jacks can either be semi-normalised (for use as insert points), or non-normalised, and reversing the board is only a matter of

loosening the jack socket's retaining nut on

the rear panel. By the same token, the boards can easily be removed for contact cleaning. Using this principle, both balanced and unbalanced connector boards can be fitted depending on the needs of the user.

The unusual twist on this model is that you can also specify semi-normalised boards with a single stereo jack on the rear, the idea being that a regular stereo jack lead is all that's needed to

rear of the patchbay to a console insert point — though this isn't necessarily as straightforward as it seems, because not all console manufacturers yet agree on whether the ring or the tip of the jack should be the insert send. These boards are wired for ring-send, which I believe is the system adopted by most leading brands, so users with consoles wired the other way around will need to swap the hot and cold connections at one end of their stereo jack lead. The front-panel jack sockets on the insert boards are actually TRS types, and the cold/screen signal from the insert point is connected to the ring connector, rather than to the screen as you'd expect. This is done to allow both balanced and unbalanced outboard gear to be connected to the insert point.

connect the

Another nice touch is the labelling system, something that's always a problem with 1U patchbays. Here, two slim metal channels are provided, each of which is fitted with a strip of white plastic, onto which the socket names may be printed. You could also type up your own labels on an inkjet or laser printer, then slide the strips of paper into the channel. You don't get a lot of height to write in, but it's probably as good as things get for a 1U, 24-pair jack bay.

Like all budget patchbays, this one uses inexpensive moulded plastic jack sockets; in time, the normalising connections are likely to need cleaning or, preferably, treating with a deoxidising solution. The beauty of this system of construction is that boards are easy to remove individually, and the option of a stereo jack insert point board looks set to appeal to those who hate making up their own cables. The price is attractive, there are some genuinely new ideas and there's a practical labelling system. 'Nuff said! *Paul White*

- E Three standard insert patchbays are available, though specials can be made to order:
 KA48INS (two rows, 14 insert cards, 10 unbalanced cards) £79.90; KA48INSB (two rows, 14 insert cards, 10 balanced cards) £82.25;
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 All prices include VAT.
- A Kelsey Acoustics Ltd, 27 Beethoven Street, London W10 4LL.
- 0181 964 8000.
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EMO E655 POWER DISTRIBUTION SYSTEM

I don't know about your studio, but the back of my MIDI rack looks like the rat's nest from hell, and a lot of that is down to the mains wiring. There are multiple distribution boards, external power supplies and over-long mains cables all stuffed into the bottom of a dark, dusty

have, the more corrupt your system gets!

EMO have a more elegant solution in the form of their power distribution units, available in several different configurations; the one I tested was the E655, a no-frills, 2U rackmount box with 12 EC connectors on



cabinet alongside the decomposing remains of various drummers' sandwiches, crisp wrappers and biros that don't write any more. It all works well enough so long as it's left absolutely alone, but disturb it at your peril! It's a case of power corrupting, and the more power sockets you

the back and a standard 13A socket on the front for when you need that extra socket in a hurry. Moulded male-to-female EC leads are cheap, and they're the only extra you need to buy to tidy up your mains wiring. Separate EC connectors can be fitted to external power supplies of

the 'lump in the line' type, but for the hated 'in-plug' wallwart versions, you'll still have to keep one of the oldfashioned four or six-way 13A distribution boards handy.

Powered from a heady captive mains lead, the EMO box is quite shallow and it's fitted with a physical earth terminal so you can earth other things to it. A green lamp shows when the power is connected, an amber lamp lights if the fuse blows, and the mains fuse is accessible via a front-panel screw-top fuseholder. The standard of finish is high, the box is rugged and, because there are no landing lights, mains filters or other metering systems, the price is quite attractive. Switch on and it works. What else is there to say — the phrase 'plug and play' was made for this particular unit. Paul White

- £ £79.23 including VAT.

 A EMO Systems Ltd, Durham
 - Road, Ushaw Moor, Durham City DH7 7LF.
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FOSTEX M80 8-trac recorder exce no condition one use only the demagnetical resolution and two Americans £550 To Data

FOSTEX R8. plus MTC Frances 812 miser, MID nule At a war montor Cunasi, los of extra.

The construction, an audion IDI st. dio for 1200 at Chris 121 743 9054

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MACKIE MICRO SERIES 1202 m ion, £150, no offers # 0171 511 1901

OTARI MX5050 reel to reel high-speed mastering recorder, 2SHTD, 2/4TR in super condition with manual, 10-nch large or small

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SANSUI MR66 6-tract rack-mounting cassette.

ord in double peed, Do by C, sync input more tracks than your average cassette multitrack, great sound and results, good condition manual, box, recent full service by Panic Mus £360 ono # 01354 695239

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SECK 18:8:2 II mixer boxed immaculate £500: Tascam 32 2B analogue master recorder, £300; Nakamichi master cassette (BX2), Dolby C £100 # Andy 01392 435334 (Exeter)

SECK 18:8:2, £600, Soundtracs PC-MIDI-24 desk, £2200; BBE 422A enhancer, £180; mixer stand plus bridge £150; Patchbays, looms, DBX SNR, Quadraverb and other racks and outboard © Carl 01223 236108

SONY DTC 750FS DAT machine okis remote £200, Studiomaster show mix desk, 16.8:2, full spec and case, Mint, £950, MFX amps, 300W pair, £240, 100W pair, £140, @ 01460 68157

SOUNDCRAFT DC2000 24-channel in-line desk with automation, £6000 ono; Fostex G16 multitrack, £1200 ono, Fostex £16 with sync, £1500. ** Mark 0181 549 0014

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SOUNDCRAFT GHOST 32-channel LE as n £2750; Drumstation, £250, Atari S20, 4Mb, monitor, £150, # Tom 0171, 624, 4369

SOUNDCRAFT SPIRIT FOLIO mixing cons 12 inputs, 4-mono, 4-stereo, £150; Peavey MIDI Master 8-way patchbay, 2 processors for merging and keyboard mapping, £100. = 0121 354 4015. SOUNDCRAFT SPIRIT LIVE 16-channel mixing cellent condition including flight cas Adnan 01628 416685.

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STUDIO CLEAROUT, Pulse, Rodent 2, E4K 128Mb, YS880 MK2, Soundtech ST62 graphic EQ, Boss PQ50 parametric, Studiomaster 38:4 desk. loads more # 0181 810 5370

STUDIOMASTER MIXDOWN GOLD 16:8:16, fully professional features include MIDI muting, flight case, reluctant sale, £800 ono. # Chris 0181 299 9800

STUDIOMASTER P7 mixer, 16:8:2, 4-band EQ, 6 aux. 4 stereo. MIDI-muting, hardly used, perfect condition, box and manuals = 0181 882 8245. TAC SCORPION MIXER, 30:16:2 with 8 aux, 4 dedicated aux returns, home use only, in excellent condition, offers. # 0181 556 7888

TASCAM 238 cassette multitrack, £500. # Mike

TASCAM 424 4-track portastudio with many good condition, £250 = Mark 0114 268 7872 TASCAM 424 4-track portastudio, in good condition, boxed with manual, # 01222 644107 TASCAM 688 MIDI studio, 20-channel mixer, MTC, 2 aux, 8-track, MIDI muting, £900 ono, Sony DAT DTC 60ES rackmount £250. # 0410

capability plus Atari 1040ST with sequencing program and monitor, £800 ono. # 01730

TASCAM 866, £700, Roland U220, plus 3 soundcards, £150; Atan ST, 4Mb, 60Mb hard disk, monitor, printer, £150; the lot for £950, no offers. ♥ Dirk 01322 528053.

TASCAM DA30 MkII DAT recorder with wired te, excellent condition, industry standard ine, £750 ono. = 01752 558218.

James 01480 461880 TASCAM MM1, 20:2 rackmount mixer, exce

condition with manual, £325.

Simon 0161 724 TASCAM MSR24 track recorder, DBX, 1-inch, 20

months old, home use only, boxed with manual, perfect condition, £3800 onc. = 0118 947 1030. TASCAM M2516 desk, perfect condition, £950; Alesis Quadraverb GT, £290; Fostex R8 multitrack, rarely used, £550 with 3 looms; Ensoniq EPS16+, £500, SPL Vitalizer, perfect, £250. # 0181 257

YAMAHA AM802 stereo mixer, 8 inputs, 6 mic/line inputs, 2 stereo inputs, 2-band EQ. aux sends, boxed, perfect condition, £175; Yamaha MV1602, 6U rackmount mixer, stereo out, 3-band EQ, 4 aux sends, 8-channel, mic/line input with trim, boxed, perfect, £275. = 01628

YAMAHA MT8X 8-track portastudio, 3-band EQ, 2 aux sends, auto punch-in/out, £500. andy 01924 469002.

YAMAHA NS10M nearfield monitors, boxed, manual, perfect condition, £175; Yamaha P2075 power amp, boxed, excellent condition, £100, Studiomaster Session Mix Gold, 8:2 flightcase, manual, excellent condition, £195.

■ Peter 01827

YAMAHA SPX990 professional multi-effects, good condition with manual, £350.

■ Jonathan 01792 472560 (evening).

COMPUTERS/SOFTWARE

AMIGA 500, MIDi-port, trackball, sample cart, 2nd diskdrive, Quartet MusicX, Superjam sequencer 1, 30 sample discs, over 100 games, £100; Boxed Akai XE8, £90 ono; Yamaha FB07, £70; Fostex 450, £200; Korg KPR77, £95 ono. ® 0121 622 2743

APPLE MAC 5300 POWERBOOK (Power PC). 100MHz processor, 24Mb RAM, 500Mb hard drive. Mono Screen Music Software, as new

£550 ISDN Modem card, ISDN Manager

software, Nubus, £175. = 01332 776244.

APPLE MAC IIFX, 20Mb RAM, 40Mb HD, 6 Nubus slots, complete with 21-inch B/W Apple monitor, ideal for sequencing, £700 ono. © Gaz 01772 673163/01253 405521 (day/evening)

APPLE MAC CLONE Power Computing 100, 100MHz, 32Mb RAM, 850Mb hard disk, Audiomedia II card, keyboard, mouse, perfect for 4-track recording, excellent condition. # Ardy

APPLE MAC QUADRA 650, 40/1Gb with 40MHz accelerator, £500, = Mike 0115 978

APPLE POWERBOOK 5300C5/100, colour screen 24Mh of RAM 500Mh H/D Oncode Studio Vision Pro sequencer, Yamaha CBX hard-disk recording system, £1500. = 0181 889 0990/0802 447358

APPLE POWER MAC 71/66, 32/350, 256k, I2 cache, 15-inch monitor, extended keyboard audiomedia II card, excellent condition, £850, will split. = Andy 0116 233 1591.

APPLE POWER MAC 7200/75, 500Mb drive,

8Mb RAM, digital audio hardware built in, runs Cubase VST perfectly, PCI slots, process perfect condition, box, manual, system disks, £1000 ono. # 01354 695239

ATARI 520ST, £100. = 0161 718 2302

ATARI 5205TFM plus Sequencer 1 software, £60, Roland CM64 and CA30 intelligent arranger, £300; Yamaha PSR420 GM/Multitimbral, £200; Yamaha RX8 drum machine, £50; Casio CZ1, £200.
Robin 01305 785675

ATARI 1040STFM, SM124 mono monitor, 40Mb aard disk drive, citizen printer plus software, home use only, £150, # 01993 776172.

ATARI 1040ST, 2Mb, 5M 124 monitor, Notator Logic and SL Log 3 (80 MIDI channels) plus more programs for DTP spreadsheets, £350. # Andy

ATARI 1040STE, 2Mb, 14-inch high-res monitor, bubble-jet printer plus sheet feeder, lots of software, £300. = Dave 01706 812123. ATARI 1040STE, with Cubase, SM124 monitor,

Band-in-a-box and MIDI files, complete recording package, all original with manuals, dongle, colour monitor and printer, £300. # Andy 0121 449

ATARIFAICON AMB 127IDE 1GB SCSI VGA monitor, Steinberg FDI digital interface, FA8, 8 outputs, expander, Cubase Audio 16, £699. ** Mike 01323 509490

ATARI MEGA4, monitor, laser printer, £300, no offers. = Dave 01202 775224.

ATARI MEGA4 computer, 4Mb, 200Mb harddisk, Atari monochrome monitor, extra floppy drive, music software and games, £270. \$\pi\$ 0141 6341027

ATARI RESOLUTION EMULATOR, converts any TV or monitor into high resolution, complete with instructions, £15. # George 0181 785 9862.

ATARI SPARES, cables, drives, one box, £25; C-Lab Editor/Librarian

for Yamaha DX keys/modules (Atari platform)

£40. = 01865 776587 (Oxford). ATARI STE, 14-inch Hi-res monitor, Cubase \ 3.1 including all leads, £250, PC Pentium 90 16Mb, CD-ROM, 16-bit full Duplex soundcard, 1.2Gb hard-drive, 15-inch SVGA monitor, MIDI interface, 2 in/2 out, Cubase 2 and Samplitude Pro. £850. # 01858 575353.

C-LAB POLYFRAME universal editor for Atan ST senes, £60.
Anton 01908 677872.

COMPAQ 386 PC. 4Mb RAM, 58Mb hard disk drive, colour monitor, mouse, keyboard, Windows, pay delivery, £225 ono; Atari 520STFM, £70. © 01266 861978

DIGIDESIGN PRO TOOLS III, NuBus core sy 882 VO, 2-Gig AV drive, Quadra 800, 21 monitor software £4500 ADAT V 4.3 £1000 verb card plus TDM, £1100. # A

DIGIDESIGN SOUND DESIGNER II v2.8. Norton utilities, Microsoft Office 4.2, Quadra 800, 32Mb RAM, 240Mb hard-disk, ideal for NuBus, Pro Took # lan 0181 556 7888.

EMAGIC AUDIOWERK 8 card, hardly used, as new, £379. \$ 01375 673411.

EMAGIC AUDIOWERK & PC card with instructions, lead and VMR software CD-ROM, only one month old, perfect working condition, cost £500, will accept, £390, = 01707 642369 EMAGIC LOGIC 2.0, for Windows sequence and MIDI control software, boxed with manual, disks, as new, £120, # 01705 261895

IOMEGA JAZ DRIVE, brand new, £260; 1Gb Jaz cartridges, £50 each. # Eugene 0181 694 6876

ROLAND COLOUR MONITOR, 14-inch display, complete with special RGB cable, surtable for samplers, \$770/\$760/\$750/\$550, in good condition, can dispatch if required, £85; Atari High-res monitor, latest 14-inch model, suitable for Cubase/Notator, £95. # 0181 668

ROLAND LA PCI CARD with external MIDI interface box, complete MT32 synth on a PC card, boxed with manuals, £100. # 01705

STEINBERG AVALON, 16-bit D/A stered converter and Steinberg Avaion Universal Sample Editor for Atari ST/STE computers with key and manual, cost £700, selling for £295; Steinberg Synthworks Editor/librarian on Atari ST/STE/Falcon computers for Roland D5/D10/D110/D20/MT32 with key and manual, £60. # 0181 883 4329 or

STEINBERG CUBASE SCORE v3. for PC. CD-ROM version, still wrapped, unused, won competition, £380. # Chris 01425 478435.

TURTLE BEACH TAHITI soundcard, boxed nanuals, £200. # 0113 232 5825/293 8955

TURTLE BEACH MONTEREZ card and registered SAW 16-track software for the PC, great digital start, £395.

Kevin 0181 443 1622.

TURTLE BEACH TAHITI, soundcard and MOX32 MIDI interface, offers for cheap sale; Roland RGB colour monitor for S760, £120 ono. # Paul 0966 463 429 or 01302 538304

DRUM MACHINES

ALESIS SR16, excellent drum machine, boxed as new, home use only, £135; Roland MT32, £95; Korg poly 800, £150; Yamaha MTIX, 4-track; Yamaha R100 reverb, amp, mixer, offers ■ 01993 776172.

BOSS DR 550 drum machine excellent condition, £65 ono. = 01224 732296 MOVEMENT DIGITAL drum module, £100: Akai VX90 analogue synth module, £110; Simmons SDE FM synth module, £85; Cheetah MS800 digital synth module, £100, all nearest offers, # Kat 0181 960 1844

NOVATION DRUM STATION rack, £290; Roland W30, large sound library, £650, 13-unit rack, lockable with castors, £110; all in very good condition.
Richard 0113 294 5649/244 3924

ROLAND R8 drum machine, excellent condition mains and manual, £250, no offers. = 01303

ROLAND TR626 drum machine, mint condition excellent presets/sounds, £100 ovno. a Jason 01202 529310.

ROLAND TROOP excellent condition with manuals, £825; Emu Proformance 16-bit stereo piano module, boxed, £125; Emu Emax II rack, 8Mb, boxed, £575; Wanted, Roland MKS50, PG300. © 01752 562343. ROLAND TR909, immaculate, manual, £875. ©

0181 342 9014

ROLAND TR909; TB303, £900; JP8000, £650; MKS80, £800; Jupiter 8, £650; JV2080, £800 ID990 £600: Oberheim Matrix 12 £1200 Xpander, £850; Emu SP12, £900; Proph Lexicon PCM70, £750. # 0181 405 0188

ROLAND TR909, excellent condition, £899: Roland TR808 with Kenton MIDI, £650; Cubase 3,0, PC with box and dongle, £200; Atari monitor SM144 FR0 # 01224 323007

YAMAHA RM50 rackmount drum machine, 500 voices, 64 presets, 133 waveforms, £350; Award MB10 DI box, £50; Cakewalk Express PC encer, £20; CP44 patchbay, £50, all as no live 0181 902 9784.

YAMAHA RX17 drum machine, excellent condition, home use only, classic sounds, boxed with manual, £80.

David 01908 616149.

YAMAHA RY30 drum machine, 4 outs, filter,

human feel, PSU, manual, £250 ono. # 01932 YAMAHA RY30, plus card, boxed, manuals, mint, £280; Yamaha MCS2 MIDI controller unit, £100.

Neil 01603 624987.

SEQUENCERS

AKAI MPC3000 10Mb memory, SMPTE option huge library, flightcase, perfect condition, £2000. 20171 254 8384.

OUASIMIDI STYLEDRIVE with Commande. 19inch rackmount, 1U high, built in floppy drive plays and records standard MIDI files, can be used for SysEx storage, plus built-in 5 part auto-arranger with built-in styles, 100s of extra developer styles, £400 ono. © 01255 821039 ROLAND MC50, including SMF converter, box,

manual, delivery, perfect working order, almost mint, £195. © 01375 673411.

ROLAND MC50, records up to 128 tracks, n condition, boxed, manuals, £179. a Jamie 01434

ROLAND MC50 MKII sequencer with manuals,

as new, £375. = 0181 809 0145. ROLAND MC202, mint condition, manuals, £285 ono; Quasimidi Technox rack, boxed, £400 ono. = Phil 0113 263 1026.

ROLAND MC303, new, boxed with manuals £400; Akai SO1, boxed, manuals, £350; Yamaha SY35, home use only, manuals, £275, Akai SG01v, mint, £200; Atan 1040STE, £100. \$\times\$ Steve

ROLAND MC303 boxed with instructions 2 months old, £450 ono. © 01404 815431.

ROLAND MC303, later version (v1.02), mint

condition with box and manual, £395; Roland Jupiter 4, good condition with flightcase, £300; Drawmer DS201 dual nose gate, £195. # 01305 774367

ROLAND TB303 Bassline with instructions, £650; SH101, £250; ARP AXXE, £150; Moog Prodigy, unused, £280; Juno 106, £400; home studio break up so more gear available. # 0114 248

ROLAND TR303 £700 one Reland TR808 £500 ono; Roland SH101, £275 ono; Roland DX10 with M64, £550 or swap Planet Phatt, roland PG800, £275. = 0113 289 9622

ROLAND TB303, mint, £750; Akai S2800, 10Mb, £950; Seck 18:8:2 desk, £450; Alesis midiverb II, £80; Zoorn 1202, £80. = Chris 01785

YAMAHA QY20 portable sequencer, with carry case MIDI cable, boxed with manuals and power supply, in excellent condition, £200.

01406

YAMAHA QY20 sequencer/expander, excellent condition with manuals, power supply, Sqyrrel 2 editor and phones £200 or swap for sound module, keyboard, # David 0141 954 0802. YAMAHA QY22 sequencer, module, keyboard, general MIDI, 8 drum kits, boxed, manuals, headphones, batteries, mint, £250, # Ben 0966

360880/01253 398916 (day/evening). YAMAHA QX5, £90; Tascam DA20, £550 ono, Fostex DMT8, full spec, £890; Kawai K1r, £150; Sony HRMP5 multi-effects, £370; Roland analogue strings, £90; all delivered. \$\pi\$ 01523

PERSONNEL

ADVENTUROUS COMPOSER/PRODUCER

seeks contacts and employment. I have an interest in all modern styles, qualifications in sound ening and previous dance-track releases. Dan 01252 628694

BASS PLAYER wanted to join band, influences: Beatles, Supergrass, Beck, Cast, Wannadies, Stone Roses, commitment essential, # Troy 01628 286 26 (Rerkshire) CLOUD RECORDS require a female vocalist, 17

to 25 with serious voice qualities to rocket dance group to new heights, send demos later, ring now. # Neil 01772 816508.

COMPOSER WITH EXPERIENCE of writing for radio, available for adverts, jingles, TV programme themes, and film work. Write to: Michael Scott, PO Box, 374 Enfield, ENZ 6DW.

DRUMMER AND BASS player needed for solo artist with major label interest, must be con and genuine, London area. = 01227 728 409 or 0802 954877

MALE VOCALIST urgently required to front Funk/Dance, original 5-piece band waiting, paying gigs booked, recording shortly, imag confidence, transport, commitment, essential. Dave 01933 270930

KEYROARDIST LIRGENTLY required for established, modern, original rock band with worldwide distribution deal. Experience essential. Influences, Floyd, Genesis. # Andy 01582

KEYBOARD PLAYER, sequencer operator required for West-Country band. Funky, Dub, Hip-hop, Reggae, lots of gigs, own studio. **

INTERMEDIATE PRODUCER required (N Cumbria) for collaboration on red-eyed, dub, hip-hop, deep breaky kind of stuff, looking to start releasing tracks, serious and fun. # Mark 01228 576147

INTERNATIONAL DANCE record company is looking for producers/engineers/artists. If you think you've got it, contact Mega Records. Only genuinely talented need apply. © 0171 720 7266. I'VE GOT music making machines, I'm looking for other people to help produce something d on them, Laika to Teenage Fanclub. w 0

KIWI MIDI-TECH, intellegent, motivated, seeks more engineering experience in London based studio. # Bernie 01274 306361.

MUSICIANS REQUIRED by gutarist to form part-time band, influences, Kraut Rock, Trance, System 7, Eat Static, Australasia, Orb, combined with Rock and Psychedelic guitar, I have many vintage effects, Copycats, Delays, I need keyboards etc. to augment a band. # 01253 344960.

SOUTH LONDON-BASED PROGRAMMER & MUSICIAN looking to work with some locals to produce some hard-stepping, art-house music. Darren 0181 333 8033

TO ALL PRODUCERS of House, Drum 'N' Bass Garage, if you want a solid vocalist for studio or live work, call. # Boneto 01703 360520.

21:3 RECORDS, require Trance/Techno/Breakbeat tracks for forthcoming 12-inch compilations, send your demos and info to: 21:3 Productions, PO Box

, 237, Learnington Spa, Warks, CV31 12L. SOUND ENGINEER, trained to Diploma let (Ment) seeks employment, anytime, anyplace, anywhere, willing to start at the bottom. Ring for written/audio CV. = Jim 01274 401 307 VOCALIST/FRONTMAN, alterative looking with

punky/indie vocal style seeks programmer for crossover Dance, Rock, Punk band; Prodigy, Senser, Ellis, Dee, Shades Of Rhythm. = 0181

WHAT CAN I do for you? What can you do for me? I've written great pop songs, now lets make some money.

Greg 01737 241977.

MISCELLANEOUS

DIGIDESIGN SMPTE slave driver, never used, boxed as new, sound designer II, Fender Telecaster, Cream, original, offers. © 0181 556

HH 100W PA amp with reverb, £70; guitar tuner, £10, various leads and multicores, Viking 8:2 mixer, £60; guitar distortion pedal, £20. = 01342

JBL M-SERIES PA speakers, in very go condition, £450 each, ono; Yamaha P2700 professional power amp, 350w per channel, mint, £500; Yamaha 16:2 mixer, mint, boxed, £350 ono. © Jonathan 0181 693 3387.

KORG PANDORA PX1 guitar effects unit, 20 editable programs, tuner and metronome, 60 types of effect variations, £95 including PSU plus

types of effect variations, £99 including PSU plus instructions. 9 01785 823204.

OLD MAGAZINES, International Musician and Recording World, May 1978 to Febuary 1985 (81 editions with one month missing), £50, no offers. 9 01403 264602.

ROLAND JAZZ chorus combo. 80w. 1x15-inch. great for keys backline, £295. # john 01904 705492. ROLAND PK5 MIDI bass nedals, faultless, £160:

Yamaha LLIE quitar, new, £480; V. Soprani melodeon, as new, £375; Whirle banjo mandolin, 695 # Rournmouth 570946

MARTIN AUDIO PHILLI SHAVES mid range

units, £550 the pair. # Mac 0171 837 6419 **OUIK LOK** heavy-duty professional triple keyboard stand, brand new but redundant since music room dear-out, £60. # 01732 361442.

TWO FULLY PROFESSIONAL Buildog flightcased keyboard trunks, padded with heavy duty castors, perfect condition, £180 each or £320 for the pair. # 0171 720 7266.

WANTED

AKAI MPC60 MKII sequencer/drum machine required, cash waiting. = 0181 883 4329 or 0956 339577

ALESIS MEO230 graphic EO: Korg Poly 800 II for sale; Yamaha FB01 sound generator also for sale # Frazer 01463 232794

ALESIS MIDIVERB (the first one) wanted, must be in working order and in good condition, will pay cash and collect # Mark 01306 731358.

CHASE BIT 1/01 circuit diagram urgently required, will pay for original or copy. = Daz 01706 526273

EMU E64/E6400 or similar. Must be in good condition, cash waiting for best offer; Pro Tools, project or session 8 system with 882 interface for Nubus Mac. # Andy 01633 613342

EFFECTS UNIT AND COMPRESSOR/GATE, a good quality sound module for a MIDI setup anything considered for home recording. = 0114

FENDER RHODES STAGE 73, with very good action and in good condition, sensible prices nlease # 0181 981 3851

ITEMS FOR HOME STUDIO Prophecy Studio Quad, Compressor, Quasimidi, Emu, Roland, Akai, modules, sampler, keyboard, TR909, TB303, SH101, J106, J8, etc. For immediate purchase. # 01252 655283

KORG G4 rotary speaker simulator. # Mile 01564 770121.

KORG M1. extra sounds, cards, ROMs or any rare for the PC for extra sounds. editor soft Martin 0121 355 0527.

KORG M1 sound cards required plus advice on M1 MIDI usage? # 01526 353032.

KORG MONO/POLY wanted, preferably with manual, cash waiting for right price. # 01354 695239

LEXICON JAM MAN wanted, for cash or exchange with SPX90. # Mark 01484 513158. LEXICON JAM MAN urgently required, name your price. I won't waste your time, # 0113 274

PATCH COMMANDER PLUS, or any MIDI device to block incoming track on MIDI cable, for use th a sequencer. # Richard 01543 258467 RHODES MK60 electric piano with MIDI. 76-

note, cash waiting. # 01332 775 273 or 0705

ROLAND CR78 MANUAL, original or photocopied; Roland TS1 write switch, cash waiting, 01563 528329.

ROLAND JV2080, in good condition. # 01932 567614. ROLAND MC202 wanted, cash waiting for right

price. # 01354 695239. ROLAND TR808, £300; Yamaha DX100, £80; Lexicon Vortex, £150; Reflex £150; TR909, £500; MS10, £100; MS20, £200 # Phil 0113 263

ROLAND TR909, able to pay £500; TB303, pay £450; SH101, pay £150; Oscar, will pay £400; Wasp, pay £100; Spider, pay £50; other synths considered. = 0114 248 2760 (evenings).

ROLAND R8 ROM CARDS: also, Roland Octapad; JD800; JP8000, Tascam 688; Yamaha VL1; VI7; Alesis Quadraverb II; Digitech Studio Quart sensible prices please # 0181 449 9698 ROLAND R8 ROM CARDS, Ethnic and contemporary drums, other cards conside ton prices paid # 01472 388415

ROM CARDS for SY77, M1 SR Prophecy, also contempory Percussion card for R8 plus Tascam 688 MIDI studio, sensible prices. # Bradley 0181 449 9698

SCI STUDIO 440 drum machine, cash waiting, = jomas 0046 31 166262 (Sweden)

SOUND MODULE with classic orchestral voices. keyboard would do, minimum 12-part multitimbral, good woodwind essential. # Olaf 01752 880267

TC ELECTRONIC effects pedals, phaser, distortion, sustainer, livedriver, power supply, will call and collect, please phone with details.

YAMAHA CS80, will collect; Soundcards for Morpheus synthesizer: New England Digital Synclavier, will collect; Lexicon Nuverb, signal processing card for Mac; Linn LM1 drum machine: R8 drum machine souncards, numbers 4, 8 9, and 10, # 01535 645233.



he VS880 digital multitrack was the darling of small studios everywhere, and the V-Xpanded version made a good thing even better remember our glowing review back in May '97? "With its automated mixdown, integral effects and virtual tracks, the whole philosophy of the VS880 is liberating, recalling the days when you just switched on a tape deck, hit Record and made music," enthused SOSs Paul Nagle. He loved its virtual tracks, which let you try out alternate mixes and different takes, and the addition of two more tracks of uncompressed audio to the V-Xpanded machine, bringing the total to six.

We raved about the 10 new effects on its digital effects card — including a Voice Transformer for hours of happy role-playing and gender-bending (with real-time pitch and formant characteristics), a Robot Voice option and Space Chorus for sci-fi fans, and a Lo-Fi Processor to give your recordings a touch of grunge. We were impressed by Roland's Mic Simulators, which use COSM (Composite Object Sound Modelling) technology to improve the tonal qualities of even the cheapest, nastiest mic.

And we loved the automated mixdown: the VS880 will let you record real-time MIDI mixes along with your audio data, up to 12,000 events per song. "The VS880 was already a superb studio tool; the new V-Xpanded machine has even more going for it," we said. Oh yes, we really liked it.

And so will you. Because we're giving you a chance to own this desirable beast. We've got a shiny new VS880 V-Xpanded to give away - and it's not just the basic one-and-a-half-grand's-worth either: those lovely generous people at Roland have fitted the VS8F1 effects board worth £340, so you can keep all your processing in the digital

> domain, plus a stonking 1.4Gb hard disk that you'd normally pay an extra £399 for. Yes, you heard us right: you could be ripping the brown paper off a gorgeous hard disk recorder worth a digi-tastic £2,240.

All we want you to do, as ever, is answer a few easy questions and then stun us with your wit, charm, and brevity. Be quirky. Be alliterative. Be pertinent. Be original. But keep it short. And don't forget to post it — it must reach us by Friday 7 November.

OUESTIONS

How does the VS880 increase recording time on a hard disk?

- a. By recording on both sides of the tape at once
- b. With compression routines c. By missing out all the
- repeated notes What does the VS880's Voice

Transformer effect do?

- a. It makes you sound intelligent
- b. It translates song lyrics into French or German
- c. It changes the pitch of your voice

What does COSM stand for?

- a. Composite Object Sound Modelling
- b. Completely Objective Sonic Mutation
- c. Comparatively Odious Sadistic Measures

Post your entry (a photocopy is fine) to: SOS Roland VS880 Competition, Sound On Sound, Media House, Trafalgar Way, Bar Hill, Cambridge CB3 8SQ



TIE-BREAKER The VS880 V-Xpanded includes a sophisticated Voice Transformer effect that provides a range of real-time pitch and formant

the small print

characteristics. "Even my own squeaky voice could be translated into a reasonably convincing Darth Vader or a manic gerbil on helium," said our reviewer. So tell us, in fewer than 30 words, what you'd most want to do with a Voice Transformer.					
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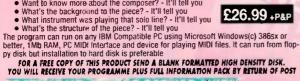
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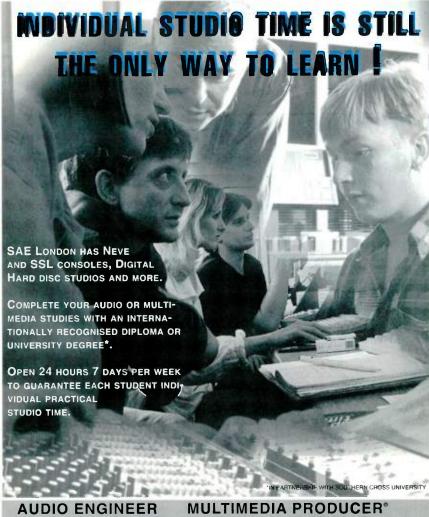
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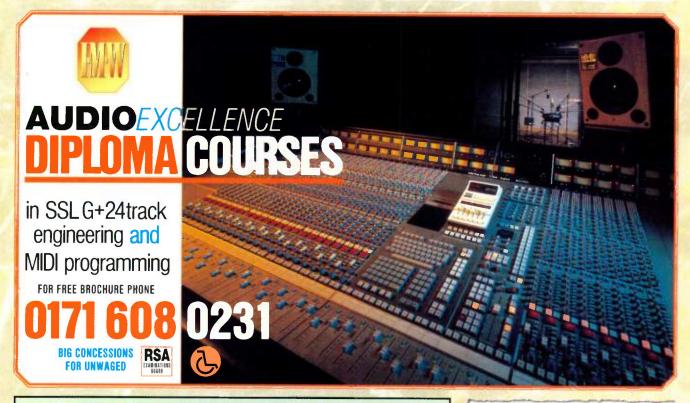
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as there ever been a more infuriating recording artist than Frank Zappa? I doubt it. Just consider the man's attributes: incredible songwriting ability; a totally original way of thinking; and no sense of quality control whatsoever! There are dozens and dozens of Zappa albums out there in the marketplace. Many of them are great, of course, but the majority are patchy, self-indulgent, or even totally pointless. Musical gems surrounded by hour after hour of needlessly flashy playing and daft time signatures. It's a bloated legacy.

Of course, I'm not suggesting that there's no place in music for excess. I suppose I just have some curious belief that any work of art should be able to justify its existence to the world. And the fact that there are only 37 live Zappa

CDs available is not, in itself, the most compelling rationale for producing a 38th.

I've been thinking a great deal about this whole phenomenon

lately, ever since I read Paul D
Lehrman's feature in
August's SOS: 'A
Technological Tribute To
Frank Zappa'. Fascinating
as they were, it wasn't
really the mechanics of Mr
Lehrman's super-complex
performance piece which
interested me, so much as the

motivation behind it. Here's Lehrman's

summing-up at the end of his article: "A welf-respected electronic musician, after hearing the piece, paid me what was possibly the highest compliment I could want. He asked me, 'How did you do that?'"

'How did you do that?' The kind of reaction you'd expect if you'd just produced a playing card from behind your ear — this is the highest compliment possible? Isn't there more to music than this? And yet this mentality is something we've all been a victim of from time to time. Why? Because all musicians and producers are, in the final analysis, terrible show-offs. If we can approach something in a way that's just that little bit more involved, just that little bit more difficult, then we will.

We idolise technique-heavy musicians like Steve Vai and Joe Satriani. And we seethe when artists like Oasis and the Fugees touch nerves in the record-buying masses with the simplest, most straightforward of material. "Stuff like that is so easy to do," we moan over our 15th pint. "I could put that track together in half an hour."

But could we really? Or would we be too busy slipping in that fancy chord we learned last week? Weaving in a few bars of 7/8 before the chorus? Or drenching the vocals needlessly in that cool effect from our newly-acquired piece of outboard?

The more music I come across, the more it occurs to me that the finest attribute any performer or producer can possess is restraint. The ability to keep things simple, even though the option is there to complicate them. The ability to leave that drum pattern alone, rather than spending hours tinkering with it until it's 10 times worse than before. The ability to edit one's own output: shortening and refining the best songs, then consigning the rest to the bin.

Some people are born with such abilities. The rest of us need to develop these skills over time. But how? Well, from my experience, it's easier than you might think. All you need to do is put a few obstacles in the way of your normal working routine. For instance, how about turning off some of your equipment? Work with a limited palette, but squeeze every last drop of performance out of it. If you're working in your home studio, with no expensive hourly rates to keep you in check, try setting yourself deadlines: 15 minutes on that bassline, say, then leave it alone.

Try out your material on someone who isn't into your style of music. Listen to their criticisms. Maybe they're wrong. More likely, though, they'll hear aspects of your songs which you've overlooked. Try following their instincts, not yours — you might well come up with something unexpected.

Am I sounding a little preachy about this? If I am, it's with good reason. After all, I did undergo my own Damascus-style conversion to this way of working a few years ago. Let me explain...

Invited to record a Peel Session at the BBC's Maida Vale studios, my band arrived to be greeted by our producer for the day: a gentleman responsible for hordes of classic, groundbreaking sessions, and a right miserable sod. We would, he informed us, only have a fraction of our allocated time to put down our tracks, so we'd better get on with it. And with that, he swivelled round to face the console.

Infused by a mixture of indignation and desperation, the five of us piled into the live room and proceeded to deliver our best performances ever. In fact, the broadcast session sounded better than any of our expensively-produced album or single material. (Nor, of course, were we the first band to discover this phenomenon.)

Was the producer telling the truth about those nightmare time constraints? Or merely using a tried-and-tested tactic for getting sluggish musicians to hurry up? Who knows? Who cares? It did the job. So thank you, Mr BBC, for teaching me a valuable lesson — one which many studio and muso types out there would do well to learn (the Artist Formally Known As Worthwhile, for one).

Shout it from the rooftops. Less really is more. Restraint is everything.

Mind you, if I ever meet that producer guy down a dark alley...

ROBIN MORLEY explains why he thinks musicians

why he thinks musicians should stop showing off and get on with making some tunes...

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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