17 DUN

felton pilate

hammer's man raps tech

ROLAND VOCODER PLUS
history's most important vocoder?

QUANTISATION
are you getting the best from it?

ALESIS D4
more than a percussion expander

NO COMPETITION

contents

SOMETHING OLD. . .

LISTENING TO THE late Miles Davis' 1962 classic album *Kind of Blue* recently I was struck by the quality of a recording made 30 years ago. Apart from the ability of the music to withstand the acid test of time, the recording itself sounds as if it might have been made for CD reproduction. Similarly recent excursions into rock recordings of the '70s, however, left me with the distinct impression that recording technology and techniques had come a long way in the intervening 20 years or less. At best these observations are contradictory, at worst they imply that somehow there had been a regression in technology or understanding of its use during the swinging '60s.

Could technology actually have become worse in some respect during these years? Or was it that many of the engineers and producers simply didn't know what they were doing? Looking (or listening) into '60s recordings, it seemed to me that these too fell well short of the standards set by the jazzers of a previous era.

The conclusion I came to was not that the technology had "regressed" in any way nor that the technicians "unlearned" any of their lessons, but that technology and understanding had advanced at unequal rates. I'll explain. . .

When the CBS and Bluenote labels were building up their excellent reputations within the jazz fraternity, they were doing it with instruments and recording equipment which was well established. The instruments in particular had been explored by a wide variety of musicians over a considerable number of years and, consequently, their behaviour was well understood. About the only notable advance during this period (as far as I'm aware) was the recording of the drum kit as a complete instrument. As the '60s brought electrification and such unprecedented approaches as Phil Spector's "wall of sound" recording technique, sound recording left well-charted territory for something new. The '70s saw advances in instrument technology increasing in both frequency and complexity.

So while music was advancing on all fronts, recording it was becoming a less and less exact science. True, a lot was being learned by those in the front line, but their experiences and experiments are now the documentation of that era. Listen to a recording of Genesis or Dire Straits today, and you're listening to the lessons learned in the recording of Jimi Hendrix and Led Zeppelin. I'm sure you'll agree, the techniques have done considerable "catching up" (shame about the music).

So what can we learn from this as we step further into the '90s? Quite a lot, I'd say. Look again at the current buzzword, "digital", and you'll see that the equipment industry is currently in a frenzy of trying to apply digital technology to anything and everything. Realistically, only certain areas are going to benefit from this. Take the example of digital EQ - it's complex, expensive, slow and often just plain unsatisfactory. Analogue EQ, meanwhile, remains cheap, effective, reliable and well understood. It's going to take considerable advances in digital technology before that situation changes.

Looking a little closer to home, are you as tired as I am of hearing digital synths trying to "sound analogue"? You spot the 'Prophet 5' preset and you know you're in for a disappointing time. And at what cost - why buy a £1000-£2000 digital synth to do the job when the real thing will net you change from £500? OK, there are other considerations, but they're not a reflection of how well hi-tech digital synths imitate low-tech analogue synths. I'm just making a point.

I suppose the real point is that digital technology - like all technology before it - has to have a chance to grow up. A lot of avenues must be investigated before we will know its strengths and weaknesses. But until that time arrives, be aware of what you're working with. To appropriate an old safety slogan: try to make sure you use "the right tool for the job". Or the right tool for the time, at least. *Tg*

MORE A-DAM FROM AKAI

Akai's support of their A-DAM digital recording system continues with the development of an upgrade which gives the DR1200 more recording time. The DR-EX Extended Recording Kit, when used with Akai STR2130 Extended 8mm tape, increases recording time from 16 minutes to 21 minutes and 30 seconds, though it's still possible to use existing recommended 8mm tape in an extended DR1200. The price of the upgrade is a mere £90 plus VAT and installation.

Still on the A-DAM front, more than a few famous names are currently using the system in their recording projects; both Midge Ure and Thomas Lang have recently recorded albums using 24-track A-DAM systems and Duran Duran (who they?) are recording their new album with the help of A-DAM. Strongroom Studios are also reporting enthusiastic use of their recently-installed system.

More information is available from Akai Digital, Pro Audio Division, Haslemere Heathrow Estate, Silver Jubilee Way, Parkway, Hounslow, Middlesex TW4 6NQ. Tel: 081-759 8268. *Dp*

16 BIT'S 5TH

Wembley Exhibition Centre is all set to go hi-tech when it hosts the forthcoming 5th International 16 Bit Computer Show. Scheduled to run from 14th-16th February, the show is intended to "demonstrate how 16-bit computers (Atari STs and Commodore Amigas) can be used by amateur and professional musicians to write and produce music", according to its sponsors.

There will be hands-on opportunities for you to check out the software on display and there will be special show prices for anyone prepared to put up their cash at the time.

Of the exhibitors claimed to be supporting the show at the time of going to press, Atari UK, Roland, Microdeal and the ubiquitous Brixton Exchange Mart are worthy of particular mention.

Music is not the sole reason for the 16 Bit Show, however, and educational, business and leisure applications will also be featured. Take the family. Tickets are available on the organisers' Ticket Hotline - (0726) 68020. Enquiries should be directed to Julie Collins at Westminster Exhibitions Ltd, Surrey House, 34 Eden Street, Kingston, Surrey KT1 1ER. Tel (081-549 3444. *Tg*

MARK OF THE BEAST

Mark of the Unicorn have announced that Console, the program which provides complete control over the MIDI Mixer 7S (reviewed MT, November '91) is now available for the Atari ST and IBM PC and compatibles. All versions are available free of charge to registered 7S users and new units are being shipped with both pieces of software as well as v1.1.1 of the original Apple Mac software.

For the Atari, Console exists both as a desk accessory and as a separate program, giving an on-screen graphic representation of all the parameters of the mixer. Mixer Automation can be achieved in various ways - "Scenes" can be saved and recalled either by program change or SMPTE frame number in MT at the computer's MIDI In port. Using C-Lab's Softlink, changes made in real time using Console in one partition can be recorded by Notator/Creator in another. For those with only 1Mb of RAM, Mark of the Unicorn have created an RMG page setup for C-Lab users and a MIDI Manager page for users of Cubase, providing direct control of the mixer from within those sequencers.

In the IBM version, again the 7S Console software looks and operates like a standard mixing console. The on-screen faders and knobs animate in response to incoming MIDI data. The IBM 7S Console can automate mixdowns by locking scene changes to SMPTE timecode. The software "requires an IBM PC, AT, XT, PS/2 or compatible computer" with a VGA or EGA video display, a Microsoft or Logitech compatible mouse and a MIDI interface. Current owners should contect Sound Technology to request the IBM software.

To briefly blow MOTU's trumpet, their Performer Mac sequencing software (reviewed MT, January '92) was given the 1991 World Class Award by *Macworld Magazine*. Well done chaps.

More information from Sound Technology at 15 Letchworth Point, Letchworth Herts SG6 1ND. Tel: (0462) 480000. Fax: (0462) 480800. *Dp*

SON OF ADMAN

MT staff wish to announce a new addition to MT Ad Manager Colin McKee's family in the form of Matthew, born just in time to cash in on 91's festivities. The editorial staff would like to wish Matthew the very best of luck when negotiating pocket money with his dad. Well done Colin and Jacqui. *Dp, Tg, St & IdS*

DAT'S CHEAP

In the wake of their well-received HHB1 Pro DAT machine, co-produced with Aiwa, HHB are announcing the launch of their own brand low-cost Professional Series DAT tapes. The new tapes come in a variety of lengths - 15, 30, 48, 62, 92 and 122 minutes and cost from ô3.30 for a 15-minute tape to £5.95 for a 122 minute tape. According to HHB, "a revolutionary design minimises errors and maximises tape life", boasting "ultra-fine metal particle formulation with stretch-resistant polymer backing, which guarantees high-performance recording and playback as well as excellent long-term stability"; in addition the tapes are housed in high-strength anti-static plastic shells, have internal spool bracing to prevent tape edge damage and offer tape labelling which conforms to new APRS guidelines. The competitive pricing HHB are able to offer is a result of the tapes being manufactured especially for them. Quantity discounts are also available.

More information from HHB Comunications Ltd, 73-75 Scrubs Lane, London NW19 6QU. Tel: 081-960 2144. Fax: 081-960 1160. *Dp*

BASKET CASE

We've important news this month that Roland UK have taken the unorthodox, but ground-breaking step of agreeing to sponsor Kingston Basketball Club (one of the UK's most successful teams) for the current season. After the surprise withdrawal of former sponsors Cadbury's Boost due to a change in company policy, Kingston were left sponsorless and minus expected funds - enter White Knight Roland, who were excited by the possibilities for reaching a wider prospective customer base through this type of sponsorship. The move has prompted a name change by the team, who will henceforth be known as Roland Kingston. Roland's influence will be felt elsewhere too - the Roland logo will be present on team strip and advertising boards at the home venue, and the music cassettes played before the game and in intervals have been replaced by live music played on a Roland E70 Intelligent Synthesiser. The instrument will also accompany cheer-leaders and play appropriate fanfares and other "encouraging music" during the actual game.

Roland mangaging director, Brian Nunney, was introduced to the team on Wednesday 18th December and was "warmly received" by the home crowd. The prospect of musical entertainment at games finds enthusiastic support from Kingston's coach, Kevin Cadle, who commented: "In the States, basketball and show-business is already a happy mix. It means an even livelier, better-value night out for all the family." *Dp*

STAND EASY

German company Konig & Meyer, reputed to be the world's largest manufacturer of microphone stands, have produced a line of stands and stackers for single and multiple keyboard setups. Featuring robust design and heavy-duty tubular steel construction, all units are height-adjustable and in some cases width-adjustable too. Apart from these designs, K&M also produce an extremely heavy-duty stand for weightier keyboards and a folding table-type stand. Stands are available in a variety of colours and finishes - black, pink, white, blue, red, nickel or chrome. To complement these designs, the company make a pair of folding keyboard seats/benches.

Further info and prices are available from Konig & Meyer, Postfach 1453 - Kiesweg 2, D-6980 Wertheim/Main, Germany. Tel: 49 9342 8060. Fax: 49 9342 80639. Yes, I *know* it's in Germany, but we're all European now aren't we? *Dp*

HANDS ON GS

Hands On MIDI Software Ltd, purveyors of fine commercial sequence data, have now completed their mammoth task of reconfiguring their entire library to support the new Roland GS format, as featured on the SC55 Sound Canvas. All data (except "the classics") is now available in GS format. In addition, demand has apparently dictated that Hands On Audio be launched to provide backing and karaoke tapes, which can be purchased in cassette or DAT formats. Customers can specify key and choose to omit important instruments and/or solos if required.

Lastly, Hands On have moved to larger premises, and have a new address: Hands On MIDI Software Ltd, 3 Bell Road, Cosham, Portsmouth, Hampshire PO6 3NX. Tel: (0705) 221162. Fax: (0705) 382865. *Dj*

ANYTHING GOES MIDI

Farfisa UK have sent us news of something of interest to the traditionalists amongst you - the Furstein "Night and Day" (TM) piano. This piano, whilst being completely traditional in mechanics, keyboard action, sound and dimensions, can also be listened to through headphones without the feel of the keyboard being altered in any way. In this mode, the acoustic piano is completely silent. Whilst it combines the look and feel of a craftsman-made traditional piano, the Night and Day makes a significant concession to the 90s with its built-in MIDI Out port. It's available in two sizes, 112cm and 120cm upright in a black polished finish only. Farfisa assure us that pricing is "very competitive".

More info from Farfisa UK Ltd, Fraser Street, Burnley, Lancs BB10 1XJ. Tel: (0282) 35431. Fax: (0282) 831132. *Dp*

DIGITAL BOOK

PC Publishing have released the second edition of Introducing Digital Audio by Ian R Sinclair. The book has been much expanded, taking into account such recent developments as Sony's Mini Disc and Philips Digital Compact Cassette, with more coverage of the DAT format, which has become ever more common within recording circles. Coverage of MASH and bitstream technology is included, and a glossary has also been added.

As with the original edition, the book strives to explain digital technology in all its manifestations in as clear and as useful a form as possible, making a good reference for technicians and those with a casual interest alike. The book is 160 pages long, well-illustrated, and retails for £6.95.

More from PC Publishing, 4 Brook Street, Tonbridge, Kent TN9 2PJ. Tel: (0732) 770893. Fax: (0732) 770268. *Dj (guesting from H&SR)*

NEW GAJITS

Gajits Music Software have announced a brand new sequencer for both the Atari and the Amiga. Sequencer One Plus retains all the features of the the original Sequencer One, but with one or two extras.

For the first time on the Atari Sequencer One makes use of the internal sound hardware of the Atari ST and STE to achieve four-channel sample playback (in stereo on the STE), and compatibility with Microdeal's Replay and Playback hardware add-ons. The Amiga version supports the dedicated sample replay hardware within the machine.

Other new facilities offered by Sequencer One Plus include the new Diamond Drag note editing system, allowing fast note editing with the mouse. Notes can be transposed, stretched, shrunk, moved or deleted with the minimum of effort. Another addition is the Juke Box Screen, which allows songs to be chained together, by loading the next song as the current song is playing, making Sequencer One Plus a little more friendly for live use. Other new features include tempo maps, auto count in, handling of MIDI SysEx data, track solo, extra quantise options and more. The price is £129.95, but for a limited period, Sequencer One Plus will be available in the form of an upgrade kit for owners of the original version for only £49.95.

More from Gajits Music Software, I-Mex House, 40 Princess Street, Manchester M1 6DE. Tel: 061-236 2515. Fax: 061-236 4044. *Dj*

communiqué

german raving

Your choice of interviews is one of the most appealing subjects in your mag. Without gravitating towards becoming a purely dancefloor mag you've managed to satisfy my interests as a techno raver. By the way, have you noticed how many of the artists mentioned by Andrew Hill (Communique, April'91) you have covered? Thank you. Of the ones still left, Nexus 21/Altern 8 would be interesting at the moment. Two other artists of interest are GTO/Tricky Disco/John & Julie and Moby.

A friend of mine - Tobias from a band called Apoplexy who are signed to the Berlin-based Machinery label - mentioned that there are interesting things going on in the electric body/industrial area. Since your last coverage of this was Front 242 (June '89), you might also like to do something on our hardcore friends.

Acts attracting interest here in West Germany at the moment are Skinny Puppy (from Canada), Frontline Assembly (also from Canada), Die Krupps (Germany) and Click Click (from Leeds in the UK). With 1992 coming, you might like to cross the channel more often.
Sir Mike MC
Sasbach
W Germany

bizarre sounds

Sitting in my studio having a quiet read of December's MT (while my girlfriend has a "girls' night in" in the other room) I came to the Bizarre Inc interview. As the music I write is of a similar style, I read intensely - until I read ". . .a D110 (rubbish for dance music, the sounds aren't there)". Who are they trying to kid?

While I admit that the presets in the D110 may not be of a dance style, the capability of the machine is tremendous. Have Bizarre Inc ever tried to program it? It is a synth after all. I find it strange to read about a group who thrive on "analogue" sounds calling a D110 rubbish, as the instrument can be made to sound very "analogue".

Please find enclosed my phone number in case Bizarre Inc are interested to hear what the D110 can really sound like.
Shaun Wight
Nottingham

and another thing. . .

I've been reading MT for some time now but I've never got around to writing you a letter because I've never had enough reasons. Until now.

Concerning Keir Thomas (Communique, October '91), I'm confused as to his priorities. He can't afford the "200 quid" for a keyboard but he's managed to obtain a CD player. Who's he trying to kid? I've played musical instruments for over seven years, have never made enough money to call myself a pro but have managed to collect two decent guitars, a bass, recording gear (four-track), a D10 and a PR100 sequencer. But I've yet to find the money for a decent hi-fi, let alone a CD player. Yet playing music is only a hobby for me.

Anyone who feels they can afford to give away gear (Don McCormick; Communique, Dec '91) would do better selling it mega cheap to the Keir Thomases of the world and then giving the money to charity, so doing them both a favour.

Moving on to Steve Clark (Communique, December '91), it was RAM, not REM, who was the program in *Tron* - an accounting program, if I remember correctly.

And to Martin Howard (Communique, Nov & Dec '91), I got my keyboard as a result of a shopping trip looking for a decent MIDI guitar. My guitar playing has earned me a reputation as a clean, tight and accurate player but I couldn't wean any 2nd, 3rd or 4th fret harmonics from the synth unit even when they came out of the guitar. And the tracking was slow, with a capital two miles an hour (and I ain't exactly Yngwie Malmsteen). MIDI guitars are an interesting idea, but I wouldn't like to get on a stage and play one, thank you. I like my credibility the way it is.

On the subject of MT, could you explain to me why there's such a difference in size between this mag and your sister, *Guitarist?* I appreciate there's a difference in sales and turnover, but I'd like to hear about it anyway.

Finally, while I sometimes read the On the Beat series, surely this would be better placed in another of MT's sisters, *Rhythm* magazine, and use the space in MT to cover playing techniques or creative sampling. After all, if I had problems with my drum programming, I'd buy another magazine to help me with it.
Edi Murphy
Eastfield
Cumbernauld

Just to bring you up to date, Edi, I hear Keir Thomas has taken up origami, Don McCormick changed his name and had plastic surgery, Steve Clark has accepted a research post in artificial intelligence at MIT and Martin Howard is currently in a service station somewhere between Betelgeuse and the Crab Nebula.

Returning to the real world, comparing MT and Guitarist is likely to lead you to some rather erroneous conclusions, I'm afraid.

You're right in assuming that it all comes down to cash, but you have underestimated the size of the guitarist-related market compared to that of hi-tech. Guitarist is the biggest-selling musicians' magazine in Europe. The number of guitarists in circulation is staggering (terrifying, actually), while that of keyboard players/disciples of hi-tech is far smaller. Part of the reason for this is that the outlay involved in hi-tech music making is depressingly large. Until that at least changes, you and me and MT are dealing with a specialist area of a specialist market. C'est la guerre.

As for On the Beat, you can certainly pick up drum programming instruction from Rhythm, but you be paying for a whole magazine in order to read a handful of pages. (It is, after all, a drummers' magazine.) As MT's editor, I'm not prepared to penalise the readership in this way. But apart from the series in Rhythm (aslo written by Nigel), I'd challenge you to find a comparable work on rhythm programming in print anywhere - that's why it's proved so popular with such a large number and wide range of people. As for a keyboard techniques series, it's such a broad and well-documented area that we really don't feel we could do it justice in a series of monthly instalments. Creative sampling, on the other hand, is a broad topic that we've chosen to cover on a regular basis but not in the form of an On the Beat-style column. In this way, you read about it from different perspectives provided by various authors as well as certain interviewees. We believe this is the best way to approach this important and quickly-evolving issue.

Now, if there's anything else you need, just drop me a line. Better still, drop in for a beer and a chat. I'd love to discuss politics or AIDS with you and maybe we could have a game or two of Trivial Pursuit. . . Tg

FRIEND CHIP TCR1 TIMECODE REFRESHER

IT'S THE MOMENT you dread - the multitrack is happily playing back your vocal and guitar parts but the sequencer has stopped, and taken out the drums, bass, pads. . . There's a dropout on the sync track and experience tells you it's usually a fatal situation.

Such a dropout might be caused by audio on the adjacent track interfering with the sync tone, or there may be a drop in the signal level. It may even be down to the cable connections between the sequencer and tape recorder. Your usual solution is to record another timecode track, work out the start time and offset - and hope.

Another area in which timecode problems arise is when transferring sync code from one tape machine to another. This invariably distorts the square wave - ultimately to the point where a dropout occurs. Square one.

It all sounds like a job for the TCR1. Friend Chip, who brought out the K..AT ST remote controller some months ago, have recognised the need for a unit which can generate a high-quality square wave from practically any distorted waveform on tape.

The TCR1 is a full-width 1U-high rackmount unit just 3cm in depth. The front panel has controls for Sensitivity and Level along with LEDs indicating Signal and Error. It also has a couple of diagrams showing a particularly ropey input waveform followed by a precise output version (like the soap powder ad with beetroot stains). The rear has two quarter-inch jack sockets for Code In and Out and a 2.1mm socket for an external PSU (not included). If you want to be able to patch in and out on the front panel, there are holes in the chassis to accommodate extra jacks. The small size of the TCR1 belies the fact that it contains no less than eight chips on a neatly laid out, double-sided PCB.

The best way to use the TCR1 is to patch it into a patchbay so that the connections can easily be changed between use on recording SMPTE to tape, and on playing the timecode back. When recording SMPTE, the Sensitivity control is set fully to the right and then backed off anti-clockwise until the signal LED remains constantly on. The Level control is then used to ensure that the correct level of timecode is recorded to tape, which will vary between multitracks. On playback, the Sensitivity control is used in the same manner, while the Level control ensures that the Sync LED on the SMPTE unit remains constantly on. Generally, the same settings work for record and playback, which means that the TCR1 is practically "invisible" in use.

The square wave produced has edges which slope slightly; this helps to minimise the crosstalk between the track used for SMPTE and the adjacent track. While the unit doesn't "jam-sync" in that it will not continue to generate timecode if a dropout occurs, it will continue to send a data "1" signal which apparently confuses many SMPTE readers into believing that timecode is still being sent for two or three frames. Ingenious.

Results in use were very interesting. One of the principal problems with using narrow tape (cassette or quarter-inch reel-to-reel) is getting the level on tape right. Too high a level gives crosstalk; too low a level gives intermittent dropouts. It was possible to record SMPTE at -15dB on a Fostex R8 and still get a perfect lock on playback. In fact, it became clear that using the TCR1 on playback really is only half of the answer; by using it to record timecode as well, there's definitely an improvement in crosstalk for signals recorded at the same level. While I couldn't test it, I would expect the results with a four-track cassette to be as good if not better.

This is because crosstalk on cassette is a serious problem and so timecodes tend to be recorded at a dangerously low level.

The idea of the two- or three-frame dropout compensation couldn't really be tested either as it is very difficult to deliberately create such a dropout. However, the delay between Code In and Out was measured with a dual digital storage oscilloscope and measured as being 140ms-200ms. Apparently, with a perfect input signal, the manufacturers quote the delay as being 125ms with a worst-case figure of 200ms, which the test agreed with. One oddity is that the waveform is inverted, but as SMPTE is a biphase signal, this is of no consequence.

Currently, no PSU is included with the TCR1; the transformers supplied with Roland Boss units work perfectly, however, as long as the polarity is reversed. Fortunately, a diode is positioned in-line with the power input to protect the circuitry should you use a power supply of the wrong polarity (why don't all manufacturers do this?).

At its price the TCR1 is unreservedly recommended, especially for cassette and quarter-inch based studios. Bearing in mind that it's also perfect for transferring code from one tape to another, anyone working with audio-visual who moves audio from one system to another (quarter-inch to video, say) and also needs to copy the SMPTE would do well to have one to hand. I bought one for use with my Fostex E16 - the level on tape no longer wanders up and down like a thermometer reading. ∎
Vic Lennard.

The DPM® 2

Riding high on the success of its big brother, Peavey's newest entry into the synthesizer market makes its debut with a smash. Introducing the new DPM®2 digital phase modulation synthesizer. Now you can have the high performance of the DPM®3se with a surprisingly low investment. The DPM 2 was designed for the stage or studio musician who wants the power, sound, and flexibility of the SE with only a limited array of extras, allowing you to expand at your own pace as your needs demand. It contains the same 4 Megabytes of internal ROM samples as the critically acclaimed SE, offering the incredible clarity and bandwidth of 16-bit resolution. Other features include: 600 internal program locations (300 factory, 300 user), and up to 800 locations with memory card; a built-in 24-bit programmable dual effects processor; ten 32-piece programmable Drum Kit locations; up to 4-program mapping for creating layers, splits, and velocity switches; 16 voice polyphony; and 16 channel multi-timbral capability with dynamic voice allocation. Plus, like its big brother, the DPM 2 is totally software based! And if that weren't enough, the DPM 2 will also accommodate simple, affordable future upgrades and additions — a sequencer, sample RAM expansion, and true sampling capabilities, to name just a few. The DPM 3se led the way in revolutionizing modern synthesizer technology. Now the DPM 2 continues the tradition.

And in this case, second best is still number one.

Visit Your Peavey Dealer Today And Play The Amazing New DPM 2!

VOICE DATA DISK 64 VOICES AND DEMO
YAMAHA SY22/TG33 **Vector Studio**

Signal To Noise

Signal to Noise
VECTOR STUDIO
Voices for Yamaha SY22/TG33

Creating sounds is becoming big business now, especially as many synths are difficult, if not impossible, to program from the front panel. Companies taking a professional attitude to the supply of those sounds are going to score points over their rivals; one such company is Signal to Noise, whose first offering is for Yamaha's SY22/TG33 synths.

Rather than provide the sounds on a RAM card, which is expensive, they're supplied on 3.5" disk in a CD-style case with full-colour booklet and label. Signal to Noise also appreciate that a simple "loader" program won't suit everyone and so supply the sounds in various formats. The review version was for the Apple Macintosh and had the 64 voices in Mark of the Unicorn Performer and Opcode Vision song formats along with the relevant modules and bulk data for Opcode's Galaxy editor. The data is also presented in Standard MIDI File format for use

with other sequencers and as a Hypercard stack.

This on its own would be impressive, but Signal to Noise also appreciate the value of the kind of "demo" available on most modern synths. Consequently, they also give you three demos in the song file formats above, in MIDI File format and for Hypercard. Full instructions are supplied on disk files of two different formats in case your sequencer can't import MIDI Files (MIDI File playback devices, for example). The sounds are divided into eight groups of eight, each of which take up a bank on the synth. These are carefully itemised in the booklet with the voice name, comments and details on whether Level and Detune vectors have been used and the functions which the mod wheel and aftertouch carry out (modulation, vibrato, chorus).

The first bank is the Showcase Bank. There is little doubt that the first preset you hear in a new set of sounds affects your attitude towards those sounds, and 'Goons' is an excellent choice. Pitchbent bells, string pad and swelled-in noise conspire to give a shiver down the spine. 'CMI22' (CMI?) is a pretty good attempt at that infamous breathy choir sound, and 'Toast' is a convincingly resonant, "analogue" funk synth. Next comes the

Acoustic/Electric Pianos; while an accurate acoustic piano is pretty well impossible to coax from the SY22, Signal to Noise have attempted to create pianos which sound good in a recorded mix. 'Quado' is one such piano, the slight chorus effect caused by detuning adding a richness to the tone. 'Padul', meanwhile, is a Rhodes-like piano with swelling strings behind it.

The third bank is Solo and Other Keyboards. Here 'Modun' is a superb Hammond-style organ complete with click, Leslie effect via aftertouch and vibrato on the mod wheel; 'Vai' is an electric guitar patch which tails away to a screaming harmonic and brings in pitchbend via aftertouch. Basses and Percussion have various goodies; fat, analogue basses in 'Housy' and 'VCO2', sharp, metallic bass in 'Atack'. The four percussive sounds are superb, from the metallic, ethnic 'Ethos' through the bell-like, PPG-style 'Tinka' to 'Chink', a key-split timpani drum and bell/flute 7ths combination. Excellent stuff.

Synth Comp/Choirs/Strings has two sounds that stand out; 'Astra', a breathy choir with strings whose pitch fall away while decaying, and 'Bells', a remarkably thick texture of bells and strings. Brass Collection varies from the raucous 'Stabs', 'Synth' and 'Fizzi' to the mellow, french horn-like 'Proms'. The Synth Pads/Musical Effects bank is disappointing in that most of the sounds are the type of sounds which you may find a use for once in a moo blune; multiple sounds brought in on a time delay is a commonly-used effect. Directly opposed to this is the final bank, Musical & Special Effects/Drums whose first three sounds could each be used for the first chord of some musical epic. 'Shore' is the perfect electronic coastline sound (complete with seagulls) and the final patch is a highly percussive set of drums.

Reverbs and delays have been intelligently used throughout, to the point that the sounds really do feel as though they are coming out of the speakers at you. A similar package for Atari ST and PC computers is currently being put together. For those of you who believe that the SY22/TG33 are the poor relations of the SY/TG family, it's well worth hearing these sounds - shops stocking them are likely to sell an awful lot of these synths via the demos alone. The whole package looks and sounds totally professional, which makes a change for sound banks not supplied on RAM cards. ■ *Vic Lennard*

Price £29.95
More from *Signal To Noise, PO Box 5005, London N10 3UW.*

ON THE

BEAT

Part 27

CALL IT ANOTHER METHOD OF "CHEATING" IF YOU LIKE, BUT USING A DELAY UNIT TO CREATE UNUSUAL RHYTHM PATTERNS - IT WORKED FOR THE POLICE. . . TEXT BY NIGEL LORD.

AS IN SO many other aspects of musical composition, one of the hardest things about writing rhythm tracks is preventing yourself from wandering down the same well-trodden path and emerging with a reworking of an all too familiar pattern. Though this doesn't seem to bother those who believe 'Funky Drummer' to be the sole path to dancefloor nirvana, anyone with any regard for orginality will almost certainly have felt the need to develop some method of breaking away from

"standard" patterns.

Short of inspiration from any other quarter, I tend to fall back on a couple of programming tricks which can almost always be relied upon to get the creative juices flowing and provide some germ of an idea on which I can build a potentially interesting rhythm track. The first of these involves taking an existing pattern and making changes to the voice assignments - not minor changes like substituting bass drum or snare voices, but more radical

Experimentation is the key: though there's often a direct relationship between pattern tempo and delay times, this cannot be relied upon to provide the most effective results. A straightforward repeat timed to occur on the beat of the pattern usually only produces a peculiar phasing effect as the notes of the delayed pattern duplicate those of the original. It's better to time the delay to provide off-beats and repeating figures within a pattern - particularly where a stereo processor is used and delay and repeat times may be set up independently.

You should also experiment to discover what difference there is between using delay effects and genuine echoes - where the repeats decay in level and eventually die away. Some patterns are more suited to one than the other, particularly where high feedback levels are involved. More importantly, however, you'll need to decide which instruments within a pattern should be subject to the delay treatment and which shouldn't. Often, the quite dramatic effects produced by the processor make it unsuited to more critical instruments such as the snare, bass drum and hi-hat but this certainly isn't always the case and you have no alternative but to adopt a suck it and see approach.

Of course, those of you with access to MIDI effect processors should be able to produce similar results "at source", without committing an external unit to providing delay effects. You should also find it possible to re-record the sequence and incorporate the delay effects into the pattern itself. This is particularly useful if you're interested in seeing exactly what's going on, or if you want to edit some of the repeated notes relative to those already in the pattern.

The five Patterns in this month's *Beat* all work extremely well with delay effects and I've highlighted some of the transformations possible with a few well-placed repeats or echoes. Obviously, the major problem lies in accurately setting up the same delay and repeat times (relative to pattern tempo) on your machines as existed on mine when the patterns were notated. To make this easier, I've stuck to a single tempo figure this month which should be adhered to at least until you have the pattern and the delay times locked together. I think it fair to say all the quoted figures were derived from fairly accurate equipment, and I think ➤

ILLUSTRATION: CLIVE GOODYER

reassignments such as using the hi-hat line to trigger a tom-tom or perhaps a pair of congas. Or maybe using the bass drum notes to trigger a synth patch or sample.

Though this seldom produces instantly usable results, it almost always reveals some path towards inspiration.

The second method I find even more effective; patch the output from your drum machine(s) into a delay unit -

preferably stereo - select a favourite pattern and adjust the delay time and feedback (repeat) levels until they are locked into some rhythmic cycle with the pattern. At any given tempo, there will be at least three or four delay times capable of producing rhythmically interesting results. Used with the right pattern (which will usually be fairly sparse in terms of arrangement) these can often provide some fascinating rhythmic effects.

you should find it possible to achieve the intended rhythmic effects without moving more than about ±10% from the stated figures.

As you can see, I've included two delay and repeat times for each pattern - labelled left and right - and these can be used simultaneously if you have a stereo processor at your disposal. If not, you'll just have to try each delay time individually and see which one you prefer. Incidentally, the figures for "repeats" are just that - the recommended number of repeats for each delay effect. You'll need to set the feedback parameter on your machine to provide the requisite number, though by and large you should find these figures are far from critical and can be varied over a considerable range - especially if the bass and snare drums are not subject to the delays.

The patterns themselves should be pretty staightforward for regular readers of this series; there are no special programming notes which need outlining - with the possible exception of the closely-spaced snare notes in Patterns 2 and 5. Though these aren't true flams, they do need to be programmed pretty close together (about a quarter of a grid division). However, given the effect on timing of the delay unit, you may find you have to experiment a little to get the correct spacing for these. ∎

PATTERN: 1a TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 1

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1e TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 5

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1b TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 2

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1f TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 6

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1c TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 3

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1g TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 7

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1d TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 4

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 1h TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat / Open HiHat / Snare Drum / Mid Tom / Low Tom / Bass Drum 1 / Bass Drum 2
TIME SIG: 4/4   BAR 8

DELAY/ECHO:	Left 630ms	Right 750ms	REPEATS:	Left 10	Right 5

PATTERN: 3c   TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Hi Tom
Mid Tom
Low Tom
Bass Drum
TIME SIG: 4/4   BAR 3
DELAY/ECHO: Left 375ms   Right 870ms   REPEATS: Left 4   Right 7

PATTERN: 3h   TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Hi Tom
Mid Tom
Low Tom
Bass Drum
TIME SIG: 4/4   BAR 8
DELAY/ECHO: Left 375ms   Right 870ms   REPEATS: Left 4   Right 7

PATTERN: 3d   TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Hi Tom
Mid Tom
Low Tom
Bass Drum
TIME SIG: 4/4   BAR 4
DELAY/ECHO: Left 375ms   Right 870ms   REPEATS: Left 4   Right 7

PATTERN: 4a   TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4   BAR 1
DELAY/ECHO: Left 340ms   Right 820ms   REPEATS: Left 6   Right 3

PATTERN: 3e   TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Hi Tom
Mid Tom
Low Tom
Bass Drum
TIME SIG: 4/4   BAR 5
DELAY/ECHO: Left 375ms   Right 870ms   REPEATS: Left 4   Right 7

PATTERN: 4b   TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4   BAR 2
DELAY/ECHO: Left 340ms   Right 820ms   REPEATS: Left 6   Right 3

PATTERN: 4c   TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4   BAR 3
DELAY/ECHO: Left 340ms   Right 820ms   REPEATS: Left 6   Right 3

PATTERN: 3f   TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Hi Tom
Mid Tom
Low Tom
Bass Drum
TIME SIG: 4/4   BAR 6
DELAY/ECHO: Left 375ms   Right 870ms   REPEATS: Left 4   Right 7

PATTERN: 4d   TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4   BAR 4
DELAY/ECHO: Left 340ms   Right 820ms   REPEATS: Left 6   Right 3

PATTERN: 3g   TEMPO: 120 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Hi Tom
Mid Tom
Low Tom
Bass Drum
TIME SIG: 4/4   BAR 7
DELAY/ECHO: Left 375ms   Right 870ms   REPEATS: Left 4   Right 7

PATTERN: 4e   TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4   BAR 5
DELAY/ECHO: Left 340ms   Right 820ms   REPEATS: Left 6   Right 3

PATTERN: 4f TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 6

DELAY/ECHO:	Left 340ms	Right 820ms	REPEATS:	Left 6	Right 3

PATTERN: 4g TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 7

DELAY/ECHO:	Left 340ms	Right 820ms	REPEATS:	Left 6	Right 3

PATTERN: 4h TEMPO: 130 BPM
BEAT: 1 2 3 4
Clsd HiHat
Open HiHat
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 8

DELAY/ECHO:	Left 340ms	Right 820ms	REPEATS:	Left 6	Right 3

PATTERN: 5a TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 1

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5b TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 2

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5c BAR 7 TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 3

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5d TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 4

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5e TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 5

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5f TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 6

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5g TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 7

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

PATTERN: 5h TEMPO: 125 BPM
BEAT: 1 2 3 4
Clsd HiHat
Crash Cymb
Side Stick
Snare Drum
Bass Drum
TIME SIG: 4/4 BAR 8

DELAY/ECHO:	Left 240ms	Right 365ms	REPEATS:	Left 5	Right 6

X28 MULTITRACKER

If your MIDI sequencing setup has taken you as far as it can go and you're looking to incorporate a few tracks of audio tape, Fostex' X28 could be your next buy. Text by Nigel Lord.

THERE'S NOTHING LIKE spending money - especially other peoples'. Recently, a friend asked me for some advice on the best way to spend a few grand he'd "come into" (. . .I enquired no further) in order to fulfil a long-cherished ambition to write and record his own music. After an hour, I'd come up with a bewildering variety of options, and a sheet filled with names and model numbers which, on reflection, did little to help him through the maze of gear he'd already found so off-putting.

Acknowledging his penchant for high-quality sound - he was the first person I know to buy a CD player - I paid particular attention to the choice of multitrack recorder and suggested one of the better four-track reel-to-reel machines, or at the very least, the highest-quality personal multitrack that lay within his financial reach. It depended, I told him sagely, on whether he needed the convenience of cassette or the quality of quarter-inch or half-inch tape. He seemed dismayed. After discussing the finer points of computer sequencing systems and the editing facilities he could expect to find on even the most

basic sampler, he couldn't believe I was suggesting he would still have to commit the fruits of his labours to magnetic tape.

Were there no digital systems available, he wanted to know? Not unless he planned spending his entire budget on a Mac and a hard disk, I advised him (the ADAS system for the Atari had yet to see the light of day at this time). What about DAT - hadn't they developed four- or eight- track DAT machines yet? Er. . . no, not yet. As a matter of fact, the two-track machine had a somewhat inauspicious start in life.

Try as I might, I could do nothing to convince him that spending thousands of pounds on digital technology and then committing it to an analogue recording system wasn't completely crazy. And yet, year after year, that is precisely what thousands of buyers of multitrackers and reel-to-reel machines are convinced of when reaching for their cheque books. And until the cost of mass digital storage systems drops to a fraction of its current level, that's how things are likely to stay, particularly while companies like Fostex can build a four-track machine with logic- ➤

➤ controlled transport functions, pitch control, an eight-input mixer, simultaneous four-track recording, switchable Dolby B and an auxiliary send and return - into about a square foot of desk space and for less than four hundred quid.

The X28 is the latest in a long line of Fostex multitrackers, the exact genealogy of which I've long-since ceased to keep track of (no pun intended). The X28 is portable in every sense of the word (small, compact, light), and its layout, like so much hi-tech gear these days, can only be described as a triumph of miniaturisation - though I'm sure Fostex's service engineers have quite a different name for it. . .

COLOUR ME BADD

WHILST COLOUR CODING of knobs is employed as an aid to use, the overall appearance of the X28 is actually rather sedate and functional - unlike a number of recent machines whose attempt to assist the application of technology has resulted in some pretty frightening front-panel layouts and hideous colour schemes.

As seems *de rigeur* these days, all of the metering and visual indicators are consigned to a single, large (by the X28's standards) liquid crystal display situated over on the right-hand side just above the transport controls. These are positioned - sensibly enough - along the front (or bottom, depending on your perspective) edge of the unit. In addition to the four record-level bar-graph meters and a pair for the main stereo buss, you'll find a three-digit tape counter, a tape movement indicator (which changes according to tape direction), all the transport control indicators, Dolby "in" indicator (along with its associated pushbutton over on the left of the display) and a "rehearsal" mode indicator.

The rehearsal facility is used in conjunction with the punch in/out function which the X28 also includes, and allows you to practise drop-ins by switching the monitor system between the originally recorded part and the one with which you intend to replace it. It is not, it should be stressed, a rehearsal facility which controls the transport system and automatically plays and rewinds the tape between two locator points (as found on many reel-to-reel machines), though there is a return-to-zero function to make life a little easier, and this can be used with an auto-play facility which may be selected whenever the tape is fast forwarding or rewinding.

As mentioned earlier, simultaneous four-track recording is possible on the X28, and record warning lights underneath each LED meter flash to indicate record-ready mode on whichever of the tracks happen to have been selected. The tape deck is equalised for high-bias tapes only, and these it plays at the standard cassette speed of 4.75cm/s (1⅞ips). I particularly liked the logic-controlled transport buttons which are a delight to use, and take care of any problems which might ensue, for example, when switching from rewind to play without first pressing stop. On the negative side, I did feel that the fast forward and rewind speeds were on the slow side, and on a number of occasions I found myself

counting sheep waiting for the tape to return to the beginning of a track.

Having said that, the fact that the X28 runs at the standard speed means that you have far less tape to shuttle through than would be the case with a high-speed machine, so I suppose you're no worse off in that respect. On which subject, I was somewhat surprised to find Fostex still opting for a standard-speed tape deck on their machines. Though the quoted frequency response, crosstalk and noise figures (40Hz-12.5KHz, 50dB and 58dB respectively) are wholly creditable for a machine at this price, you can't help wonder what might have been achieved with tape running at twice the speed. I know recording times would be halved, but that still leaves room for a 20-minute track on a C90 - and who records them any more?

ON THE BUSSES

IN MY EXPERIENCE of using cassette multitracks, I've come to the conclusion that like or dislike of a machine is based almost entirely on the facilities offered by the mixer section. In this respect, the X28 acquits itself well, though I think it fair to say that what economies have been made on this machine as a whole have been made here.

The X28 boasts an eight-input mixer, each channel having its own level, pan, aux send controls, and additional trim controls for the four mic level channels (1-4). The other four channels (5-8) may be used for recording line-level instruments or for routing signals from the four tape tracks on mixdown. To facilitate this, each channel features a push button to switch between tape and input signals, and also dual-function auxiliary send controls which, apart from being pre-fade (unlike the mic inputs which are post-fade), can be used to direct signals from either tape tracks or the four inputs to whatever piece of external equipment you have connected. If this happens to be a reverb unit with a stereo output, both left and right signals may be fed back into the X28 via individual sockets on the rear panel and adjusted (like the auxiliary send signals) by a master level control.

The main stereo buss can also be pressed into service when recording, as a means of combining two separate inputs onto a single tape track. And the presence here of the X28's only EQ facilities - individual low and high controls - certainly make it useful when input signals need tweaking in some way (which is nearly always). The EQ offers nothing more sophisticated than a 12dB cut or boost at 100Hz and 10KHz, but it's enough to make the X28 a machine on which more than simply input levels can be controlled.

Determining which tracks are to be recorded is the job of the four record-select switches immediately above the aux send controls over on the left of the unit. With a centre Off position, these can be switched to one of the four tape tracks (bypassing the pan and EQ controls) or to the left or right channels of the stereo buss. As you'd expect, a master fader controls the overall output from the stereo pair, which may be routed through to the rear panel for

> "I've come to the conclusion that like or dislike of a multitracker is based almost entirely on the mixer section - the X28 acquits itself well."

connection to an external master machine for mixdown.

Monitoring on the X28 is taken care of by two slide switches, a level control and the provision of a headphones jack and a pair of phono left/right output sockets on the rear panel. The first of the switches determines whether stereo signals from channels 5-8 are sent to the stereo buss (as they would be in most recording and remixing situations) or to the monitor buss - a setup referred to as Monmix in X28 parlance.

The main monitor selection switch has three positions, the first of which combines Monmix signals (from channels 5-8) with those from the stereo buss and makes them available for monitoring. The second position allows monitoring of the auxiliary send signals, while the third combines these with signals from the stereo buss. It's not the most comprehensive system in existence (why do so many manufacturers offer monitoring of aux sends but not returns?) - but it's enough to get by with in most recording situations.

INS & OUTS

CONNECTION HARDWARE ON the X28 includes quarter-inch jack sockets for each of the eight inputs which, like the sockets for phones and (optional) punch in/out footswitch, are situated along the front of the unit. Also here is a socket for the connection of a footswitch which duplicates the action of the return-to-zero button on the top panel. According to the manual, this is the same kind of switch used for the punch-in facility, so providing you don't need to use both at the same time, you should find it possible to get away with buying only one.

All rear-panel connections are via RCA phono sockets and in addition to those I've already mentioned, you'll also find four tape out sockets should you wish to do your mixing down on a separate desk. The last of these - Output 4 - is also marked as the socket to use if you're involved in MIDI/tape synchronisation. However, other than the fact that it is one of the outside tape tracks (and therefore less likely to bleed through onto other channels) there's nothing special about it in terms of signal levels. Neither is it possible to disconnect it from the noise reduction system should you experience any problems reading sync code - though Dolby (as opposed to dbx) is less likely to present any problems on this score.

VERDICT

NO ONE WITH any experience of cassette multitrackers should have difficulty operating the X28. Unlike that of some machines, the signal routing section of the mixer section is quite straightforward and not once did I find myself scratching my head wondering why the synth I had connected to input 6 hadn't ended up on tape. I suppose this could be said to reflect the inherent simplicity of the system and its lack of flexibility - but that's budget multitrackers for you. If it's versatility you need, then I'm afraid you're looking at a significantly higher

investment - most likely in a separate desk and recorder.

On to the all-important question of whether or not you can make good-quality recordings of four or more instruments on this machine. The answer, unequivocally, is yes. In the X28 you have a multitracker with a performance to match that of a good-quality reel-to-reel of less than a decade ago - and the significance of that shouldn't be understated. There's a clarity and spaciousness about the X28's recordings which - I have to confess - took me by surprise. Aren't personal multitrackers supposed to sound compressed and woolly? Apparently not.

Life isn't quite so sweet with second-generation recordings which have been bounced down, but the advent of MIDI, the sequencer and the recording of virtual tracks has drastically reduced the need for this. Indeed, more and more people are finding themselves recording direct to stereo mastering machines and avoiding the multitrack stage altogether. Of course, this is only a realistic proposition if you have enough MIDI-equipped devices and few people can regularly get by with only two tape tracks. Nevertheless, in the current scheme of things, a four-track machine does look a much more attractive option than it did a few years ago - and in this light, the X28 undoubtedly fits the bill for a great number of people.

Given this new lease of life for four-track, I'd have thought it an obvious move for manufacturers (like Fostex) to have included built-in MIDI sync devices on their machines. I accept that though not everyone is likely to need MIDI synchronisation, a very large percentage of multitrack users do, and buying a machine with built-in facilities would be a real plus. Indeed, the inclusion of a MIDI socket on the rear panel would, I believe, be of considerable psychological importance in convincing punters that the development of the multitracker is keeping pace with the rest of music technology. As it is, the reaction of the friend I introduced earlier is likely to be typical of people asked to spend a significant proportion of their budget on a recording device.

But I've no wish to take anything away from the X28; this is a most attractive little machine which I got on with extremely well. It's quite capable of adopting a central position in any budget recording setup and becoming the real workhorse of the system - if you can attach the term workhorse to a device of such diminutive proportions. Frankly, on any piece of equipment which contains mechanical as well as electronic components, I'd be looking to find a name like Fostex before I'd be talked into parting with my money. Too much of what arrives from the Far East these days is considered disposable, and anything that moves must eventually wear out. When that happens it's nice to know there's a service department somewhere that can sort the problem out. Buy with confidence. . .   ∎

"There's a clarity and spaciousness about the X28's recordings which took me by surprise - aren't multitrackers supposed to sound compressed and woolly?"

PARTNERS IN RHYME

After 12 years playing soul and funk, Felton Pilate is keeping the company of rap superstar Hammer - and playing keyboards in his band, writing his songs, producing his records. . .

Interview by

Nick Batzdorf.

Text by

Tim Goodyer.

HAMMER'S FIRST TWO ALBUMS (THREE IF you count the original release of *Let's Get It Started* as *Feel My Power*), *Let's Get It Started* and *Please Hammer Don't Hurt 'Em* have sold somewhere between 13 and 15 million copies apiece. If the major record companies needed convincing of the commercial viability of rap, Hammer - who's signed to Capitol - and his EMI counterpart Vanilla Ice are it.

Hammer's indisputable level of popularity is confusing, however, since he's regarded by hardcore rap fans as having sold rap out, and he's resented by the "traditional" pop fraternity simply for being an exponent of rap. Yet the second single from Hammer's

current LP, *Too Legit To Quit*, is also the theme from Barry Sonnenfeld's film *The Addams Family* and is sure to become just another of Hammer's string of hit singles.

Perhaps part of the explanation for the musical appeal of MC Hammer lies with 38-year-old Felton C Pilate II - Hammer's co-writer, co-producer, keyboard player and regular member of his touring entourage. Unlike Hammer, though, this is not Pilate's first taste of success, as he previously spent 12 years as lead singer, guitarist, keyboard player and songwriter for American soul/funk outfit Con Funk Shun (who also performed as the backing band for ➤

various Stax artists). With them he chalked up 11 albums' worth (five of them gold) of playing, production and engineering experience. In '84 he left the group, opened a recording studio and became involved in arranging and producing for some of Fantasy/Volt Records' roster of artists. Then he met Hammer.

Catching Pilate during Hammer's recent US tour, and just days from the finish of *Too Legit to Quit*, there are questions to be answered. Questions about Hammer's production techniques, for example. Questions about Hammer's approach to sampling other artists. The single 'U Can't Touch This' topped the UK charts in 1990, flaunting its dependence on a sample loop from Rick James' '82 cut 'Super Freak'.

"That gets into a whole philosophy of the rap culture", responds Pilate. "Honestly, had you told me, five, seven years ago that my biggest work was going to be involved with rap music, I'd have told you to get out of here. I wouldn't even have considered that music - you know? So my whole involvement with MC Hammer has been kind of a melding of ideas.

"He brings to the table with him his lack of knowledge - I'm not saying that in a negative sense, but he doesn't have a concept of what 'traditional' music is supposed to sound like. He's got no formal musical training, so when he gets his hands on a synthesiser - an RX7 drum machine, which not only has drum sounds, but electric bass sounds and a couple of pitched instruments that you can assign to the keyboard without having the narrow format of what 'proper' music is supposed to sound like - he tunes these keys to what works for him, and he plays it!

> "Had you told me, five, seven years ago that my biggest work was going to be with rap music, I'd have told you to get out of here."

"Now I've got this microtonal thing happening on the bass which, of course, I can't duplicate on a traditional instrument, but it creates the tension in a hip hop record that we're looking for. So, it's kind of like I'm schizophrenic - there's Felton Pilate the producer, versus Felton Pilate the musician. The musician says that things have to be assigned to certain keys, that if our song is in B minor, and you're going to bring in a scratch, that scratch needs to be in B minor also. Right?

"Not the case. Rap and hip hop, being an inner-city kind of music, is based on the idea that traditional music theory doesn't apply. Or 'I made this record, not because I'm a musician, but because I like part of this record mixed with part of this record, and it suits my needs; here it is'. And as an art form, part of it developed from DJs doing their thing over someone else's record live at parties. You know that the DJ is playing someone else's record - that's what he does, he's not a musician. But he now has his own creativity to add to it: 'I've got a 32-bar section in this record where there's no vocals going on. Hey, here's my part'.

"That has developed over years, and that's *the art form* where we have little snatches of this record and little snatches of that record. And there's now compilation, or a jumbled mass of beats and rhythms beating against each other. We tie in all this by adding our own drum beat underneath to lock in the various parts and it becomes the *new* art form. It's a whole new creative thing.

"But in some cases, it's not as easy as it sounds. 'U Can't Touch This' was easy - that was a case of taking a four-bar sample from this song, locking it in with our own drum beat underneath, doubling up the bassline on the synthesiser, adding another synthesiser lick and Hammer doing his vocals on top. That was it. It wasn't the most creative thing that we could have done, but certainly the most commercial. It wasn't a case of 'Let's steal this piece over here'. You notice that Rick James' name appears on the album? It's a case of we like it, we've used it, what do you all think? We knew we were going to have to work out a money deal so they worked out whatever it was that they needed to work out.

"When we're doing it like that, I guess it's just keeping in the tradition of rap and how the whole thing got started.

"Now the other thing to do is not to use the samples at all, or not to use any *recognisable* samples. We may sample a two-bar drum bridge from somebody's record and just the fact that it's already been processed - it's already three or four generations old from the original recording to the mixed-down tape, to the mastering process - means that it has a sound, and a presence in it that is not possible to get from playing, listening to that bit and duplicating it on a drum machine, or even getting your own drummer to copy it. That same thing is not there. So that kind of helps the sound. There's a certain tension, a certain cacophony that works very well for rap and pop music.

"Alternatively, take Hammer's example of doing 'Have You Seen Her' which is not hip hop at all. We're not dealing with hip hop music, we're now dealing with a song where the lead vocal happens to be spoken as opposed to sung. It's kind of different, very soft, but also very appealing to people, say, my age. People who could not, or would not appreciate rap in another form could now listen to the record, and even though they say 'I hate that music', they now listen to it and say 'Hey, this is all right!' and 'I remember that song - used to sing that when I was in high school'. So, there are different approaches to rap music. Not all of it is hip hop."

WHAT, THEN, OF PRODUCTION VALUES? How much do the techniques of Hammer and the 1990s compare with those of Con Funk Shun and the '70s?

"It kind of varies from song to song", comments Pilate. "In some instances, the same procedure I would have used in doing demos with Con Funk Shun wound up being the same procedures I used for the current Hammer album. We worked out our basic ideas for the song on an eight-track first, and worked out the format before going into the studio.

"However, on the *Please Hammer Don't Hurt 'Em* album, and *Let's Get It Started*, that whole demo ➢

> procedure was bypassed. Many times the first thing that came to our minds was the final product. That was a little new for me, but exciting at the same time: 'Look, we're just going to go for the master right now and no, we haven't heard these lyrics with the music, but let's go for it and then we'll go for whatever edits or changes on the spot'. If we didn't like that verse, we sat down and wrote a new one.

"It's nice to have the technology to be able to work out almost the entire idea in my hotel room or at my house before ever getting to the studio. It's nice to be able to hear how the parts are going to work - including the background vocal parts. I can now sample and rearrange the whole tune."

Sampling obviously plays a major part in Pilate's working methods - but not always in the way you might expect. Sampling backing vocals off demo recordings for use on record and in live performance, for example, is commonplace.

"Again, it's done on a song-to-song basis", he says. "On one of the demos that we did on the road for this album, the background vocals sounded just fine, so I sampled them off the eight-track.

"For a live performance - as an addition to the background vocals on stage - I go back and sample each word and assign it to a different key, so that when we're playing it against the live band, we're not obligated to stick with the same tempo as the record.

"On this album I've sampled a lot of the background vocals. After they've been committed to tape - mainly because I foresee redoing remixes of most of the album. On a couple of Hammer's tunes, I also have stereo samples of the horn tracks, where, if there's a repeating phrase, I just took a sample of the best phrase and repeated it a couple of times. And there are a couple of tunes now where everything, all of the sounds that occur on the album, I could now just hook up my rack and you would hear everything that's been recorded on tape - with the exception of Hammer's lead vocal.

"Hammer's voice really stands out on tape, and it almost doesn't matter what microphone we use. As a matter of fact, half the vocals on the *Please Hammer Don't Hurt 'Em* album are done with a Shure SM57 and SM58 microphone, and it sounds wonderful.

"We've tried different microphones and almost anything you put out there works. And we have recorded in so many various environments - everything from the Record Plant in Sausalito to a clothes closet at my house. I've done his vocals on a bus at four o'clock in the morning with all the lights turned out, in the middle of somebody's trailer park somewhere!

"We just cut down the popping and put a little bit of compression on - and he likes a little bit of 2.2K

> "Hammer brings to the table with him his lack of knowledge - he doesn't have a concept of what 'traditional' music is supposed to sound like."

EQ added to his voice, just to bring it out - but other than that, he has a really easy voice to work with."

Back to sampling. More than allowing control over the vocal and horn parts, Pilate's sampling gives him the ability to completely remix tracks.

"If I want to work out a whole new arrangement of the song, I don't have to do it at the studio", he explains. "It's not like I have to worry about the album budget, but it's just an old thing for me - maybe just an ego thing - where, if I can bring it in for under $75,000, I'm happy. I never could see the logic of 'Hey man, I spent $200,000 on this album', and being proud of it. That's a waste of money."

Remixes can be worth big money, however. In the UK a whole industry of remixing has grown up around the club scene and the record companies' thirst for prolonged chart success. But Pilate doesn't see his and Hammer's use of remixes as a moneyspinner, more as a means of providing a variety of forms for a track.

"There may be two or three different remixes of the same song on the same 12-inch 45", he explains, "just to add flavor to the same record. There will be a version that would be real hot in the clubs, that has less vocal, more beat, more measures. . .

"But I've heard Jimmy Jam and Terry Lewis do a remix of 'Diamonds are a Girl's Best Friend', on Herb Alpert's album where they only kept the lead vocal, the background vocal, and used a different arrangement of the music. They may have kept the same drum beat, but went back and added a different bassline, a different chord progression - like maybe in the relative minor of the original key - and it adds a whole new flavour."

UNLIKE MANY OF HIS RAP CONTEMPORARIES, Pilate's longstanding involvement with music will have brought him into contact with a considerable amount of hi-tech equipment. Ordinarily you'd simply chalk it up to experience, but with the present fascination for older synths and drum machines, it's a considerable asset to Pilate.

"I use an interesting combination of the old and the new. I still have my DX7 that I bought in Japan. I still have my Roland JX3P that has nice, real thick bass sounds, which is basically what I use it for. And the big Roland JX10 - again, it's a nice, big, fat sound. I'm using those combined with all the new stuff that I've gotten. Some of the old DX7 electric piano patches, when MIDI'd with my new JD800 - the new Roland - make really nice bell-ish tones."

While the hip hop movement has tended to scorn the politeness of digital synths, the ability of samplers to recall sounds from the past have ensured their popularity. In particular, Akai's samplers have become almost synonymous with hip hop. So what's Pilate using - an S1000, S950. . .?

"As a matter of fact, the only sampler we used on the *Please Hammer Don't Hurt 'Em* album was a Roland W30", comes the surprising reply. "Not that there weren't other things out there - that's what I had and that's what I felt comfortable with. I had just bought one for myself, right before joining Hammer on the tour, and I was really excited about

it. Fourteen seconds of mono sampling time at 30K - it was like 'Hey, I like this!', and I discovered how to do pseudo-stereo samples on it, although it samples in mono. So I was using it to fly in background parts.

"The new Roland sampler has even allowed me to go back and experiment with my Yamaha RX5 drum machine. I can take drum sounds off of there and combine them with the standard Roland library, or some other stuff that I've sampled off record. This will allow me to layer up to four different snare drums together, alter the pitch of each individual sample, and give me a whole new snare sound. So I've been off into sample heaven here because I've got 16 Meg of memory to work with."

But the sound of a specific musical style relies on more than just the equipment made to produce it - ask any guitarist. One of the most prominent features of rap is its bass - it has to be heavy enough to move the walls in a club and yet still be able to come across on radio. One trick used by dance producers in general is to test out a mix on a car stereo. Pilate prefers to check out his mixes in as many different situations as possible - and as many cars as possible.

"Many times we'll take a mix - a DAT or a cassette - and listen to it in four or five different cars that happen to be sitting out in the parking lot. We've taken tapes to live concerts, to the PA system, to see what it sounds like on that.

"One interesting thing that I've done to check out the mix: Nady used to make their wireless guitar systems, their 410 model, basically a low-power FM transmitter and receiver. So, I would figure out what frequency the transmitter was transmitting at, and I would put it into the output of my mixer, pan everything to mono, and go tune in to the mix out on my car radio to hear what it sounds like semi-compressed.

"One time I had a pair of small speakers made by a company called Dimension, and I remember watching Hammer listening back to the mix by picking up each of the speakers and putting them over his ears, as if they were headphones! We tried it at a couple of different volumes: real soft, and what would have been painfully loud for me. That low-end stuff is normally associated with a lot of low end on the bass and TR808 kick drum and we figured that if it sounded really good on the small speakers, it would work on the big systems. You didn't have to feel it down there, but if you are at least aware that it was there, we figured it would work. And of course, it's very common for us to stick on someone else's record in the studio, do a quick A/B check."

Bass - the byword of the dance movement, and with it goes one of the secrets of a well-crafted production. Is Pilate prepared to share the secrets of Hammer's bass with us? He is: "Well, the sound comes from one, maybe two things. An 808 kick drum is basically a low-tuned, almost 'sine' wave. It's a big, round, very low note with a very sharp attack on it. When I've sampled it and looked at and expanded the wave, it's almost a perfect sine wave. When you tune it real low you get that 'hmmmm'. Once you've added an envelope to that sound - which could be duplicated from an

analogue synthesiser, you get the sound that is normally associated with these types of records. Sometimes we add analogue synthesisers, and you get the beating between the two because that kick drum is normally at a certain pitch.

"Other than that the secret is just making sure that you've got lots - if that's the style that you're looking for - lots and lots of low end on your kick drums. But then you're going to have to make adjustments for that in your volume level to make sure that you're not overloading. And if you want it totally dominating your mix. . . I mean, that's what you do. I want to make sure that there's enough low in there so that when you do put it in one of these boom-boom car systems, that's the effect that you get.

"In the studio *I* don't turn it up that loud. I feel that if I can sense the low end there at a low volume, that's fine for me. What I do many times, just to make sure that I hear everything clearly, is crank the speakers up and go step into the next room, figuring that if it still sounds clear enough to me through two or three closed doors, the mix is fine. I used to call that the party effect - you know, you walk up to someone's house, and the place is rocking. And if you can identify what the song is from outside the house, that's a nice clean mix." ∎

"If it still sounds clear enough to me through two or three closed doors, the mix is fine - I used to call that the party effect."

EQUIPMENT

INSTRUMENTS/SEQUENCING
Apple Mac Computer
Korg M1R Expander
Korg M3R Expander
MOTU Performer Sequencing Software
Roland D70 Synth
Roland JD800 Synth
Roland JX3P Synth
Roland S770 Sampler (16Meg)
Roland P330 Piano Module
Roland R8M Percussion Module
Yamaha DX7 Synth

OUTBOARD
Aphex Compellor Compressor (x2)
Lexicon LXP1 Reverb
Lexicon LXP5 Effects Unit
Lexicon PCM70 Reverb
Roland 48-channel Line Mixer
Tascam 688 Midistudio
Yamaha REV7 Reverb (x2)
Yamaha SPX90 Multi-fx x(2)
Yamaha SPX900 Multi-fx
Yamaha SPX1000 Multi-fx (x2)

PDC100 PRO DISK COMPOSER

Sequencing on 32 tracks, SysEx datafiling and a built-in disk drive for around £350 make Brother's PDC100 a must to check out. Review by Simon Trask.

DOES THE STAND-ALONE sequencer have a future? While computer-based sequencing packages have been enjoying stellar success during the past few years, the once-ascendant star of the stand-alone sequencer has been steadily waning. Sequencing packages like Creator/Notator and Cubase have blossomed through a series of software updates and hardware add-ons while stand-alone sequencers have more or less, well, stood still - closed-system stagnation in an era of open-system dynamism. This very stagnation - or perhaps I should say lack of imagination on the part of the manufacturers - poses at least as much danger to the continued well-being of the stand-alone sequencer as computer sequencers do. And now that compact, lightweight "notebook" computers are starting to erode its traditional advantage of portability, manufacturers need to bring out the strengths and advantages which are unique to the stand-alone sequencer - strengths and advantages which have to do with it being a dedicated machine. The question is this: when the market for notebook and (even more compact and lightweight) pen-based notepad computers explodes, when the machines become affordable and MIDI software developers adapt their software to run on them, what will the stand-alone MIDI sequencer be able to point to that

will justify its existence? Answers on the back of a £20 note, please.

Maybe what's needed is a relative unknown in the field of stand-alone MIDI sequencers to bring fresh insight to the medium. Maybe what is needed is a spot of Brotherly love. Japanese company Brother, best known for producing printers and electronic typewriters, have already dipped a collective toe or two into the backwaters of the stand-alone MIDI sequencer market, though without causing any significant ripples. Will their new PDC100 Pro Disk Composer make more of a splash than its predecessors?

SHAPING UP

FIRST OF ALL, some key facts about the PDC100: it costs under £400, has a built-in 3.5" DSDD disk drive, its internal memory can hold one Song (maximum length 999 bars) and up to approximately 21,000 notes, and it can be used as both a 32-track MIDI sequencer and a MIDI SysEx datafiler. It's also compact and lightweight, measuring a modest 10"(W) x 8"(D) x 2"(H) and weighing just 2.42lbs - which in portable computer terms places it somewhere between a notebook and a palmtop.

With half of the PDC100's front panel taken up by its built-in disk drive, the user interface consists of ➤

just six buttons and a 2 x 16-character backlit LCD window located in the other half. With so few buttons, it's no surprise to find that each one has three functions. Fortunately, you're helped in familiarising yourself with the PDC100 by having the functions of each button and a list of the software pages printed on the front panel. The list is laid out matrix-style to give you a clear picture of the multi-level organisation of the pages and to let you see at a glance which pages are on which level. One particularly useful operational shortcut allows you to return to the main record/play page from any other page with either one or two dual button-presses depending on your location. Also useful are Shifted button-presses which jump you straight to the beginning or the end of a Song.

While we're being positive, the PDC100's backlit LCD is bright and clear, and can be read easily from a variety of angles - which is more than can be said for some LCDs. And on the subject of visibility, the MIDI output of your controller can be made visible by selecting a MIDI monitor page on the PDC100.

The rear panel houses one MIDI In and one MIDI Out socket, 7.5V DC power input (the PDC100 comes with an external AC adaptor) and the power on/off switch. Syncing the PDC100 to tape will require either an external sync box or a tape machine with built-in tape sync, such as one of Tascam's MIDIstudios.

"If a disk is in the drive when you switch on the PDC100, its Preset file will be loaded automatically. A nice touch."

TIME & PLACE

ALONG WITH ITS 32 MIDI tracks, the PDC100 provides a Beat/Tempo track for time-signature and tempo changes during the course of a Song, and 64 Units (single-track sequences) for pattern-based recording. The PDC100 allows you to set up time-signature and tempo changes for a whole Song before you've recorded any tracks; you also have the option of switching off the tempo changes at any time.

The Beat/Tempo track allows you to program a different time signature for every bar if you want. The purpose of programming time signatures is to let you bring the PDC100's bar count and metronome downbeat into line with what you play. So some of you may be disappointed to learn that the time signature can only be set within the range 1/4 - 8/4. Wot, no 13/8?

Tempo can be set in the range 30-250bpm and, as with the time signature, you can program a different tempo at the beginning of each bar. Unfortunately, this allows for neither subtle fluctuations of tempo within, say, a 4/4 bar, nor smooth increases or decreases in tempo across two or more bars. Recording in 4/4 and then changing the time signature to 1/4 does no good because the PDC100 chops out beats two and three and merges whatever's on beat four with beat one of the next bar!

Tempo changes are absolute, rather than relative to the initial tempo, so if you decide the overall tempo of a Song needs changing you'll have to edit every tempo change accordingly. Imagine you're rehearsing with a singer, you get asked to take the

tempo down a bit for practice purposes, and there's you saying "OK, wait while I make these ten tempo changes". Not really on, is it?

Having the 64 Units allows you to build up a library of single-track musical parts, each of which can be up to 100 bars long. Units exist outside of the Song, and can only be recorded in isolation, but they can be either Copied or Placed into any of the 32 Song tracks at any time during recording, and to any location in the Song.

While Copying a Unit duplicates its data, Placing a Unit inserts a call to it into the destination track; when the PDC100 comes across a Placed call, it knows to play the data in the Unit along with whatever's in the other tracks (which could be calls to other Units).

Placing therefore saves you time and economises on memory. For instance, rather than record a repeating bassline "x" times, you can record it once into a Unit and then Place the Unit "x" times into a track.

To record a Unit within the context of the tracks, you record the part as a track first and then Copy it across to a Unit; then you can delete the relevant bars from the track and Place the Unit into the track in their place. Unfortunately, Units can only be Placed at the beginning of a bar, so you can't create echo or delay effects by Placing a Unit into two tracks and offsetting one against the other.

CHANNEL FUDGES

EACH OF THE PDC100's 32 tracks and 64 Units can contain up to 16 MIDI channels of data. The sequencer records multiple channels at once, so you can record parts using split and layer textures which require notes to be transmitted on more than one MIDI channel. Multi-channel recording is also very handy if you want to transfer sequences across to the PDC100 from another sequencer via MIDI (sadly, the PDC isn't able to read Standard MIDI Files off disk).

Brother's sequencer has no function for extracting MIDI channels from a track, so if you do record a complete multi-channel sequence into one track, you can't separate the channels onto different tracks. Nor are there functions for deleting a specific MIDI channel from a track or for merging tracks. However, there *are* ways to fudge all three functions, and without getting into a lot of detail it basically involves routing the PDC100's MIDI Out back to its MIDI In (making sure that its soft MIDI Thru function is disabled so that you can't get MIDI feedback), setting its MIDI channel output filter to discard the channel(s) you don't want to record, and then (re)Recording the relevant channel(s). To speed up the process, you can bump up the tempo as far as possible, then reset it once you've finished. Incidentally, unless you want to be switching MIDI cables whenever the urge to merge or extract takes you, a MIDI input selector box is a must.

Extracting, erasing and merging Units takes a little longer, as you first have to Place or Copy the relevant Unit(s) into one or more tracks, then go through the re-recording process just described, and then finally ➤

Copy the relevant track or section of a track into another Unit.

Track merging can be particularly useful where Units are concerned, as it allows you to build up a multi-part Unit from several different tracks and then Place it in a single track. In this way you can have one Unit which contains a rhythm pattern consisting of just kick, snare and hi-hat, another Unit which adds in some percussion, a third which adds in a bassline, and so on. Then you can have instrumental parts dropping in and out of a Song simply by Placing the relevant Units at the relevant locations in the Song.

RECORDING

THE PDC100 IMPLEMENTS three methods of recording for both tracks and Units: real-time, automatic (preset) punch in/out and step-time. Overdub loop recording hasn't been implemented, however, which is unfortunate unless you're happy recording rhythm patterns into your drum machine(s) rather than into a sequencer (see the Blow interview elsewhere in this issue for a view on this).

Real-time recording into a track on the PDC100 allows you to start recording from bar one and keep on playing until you've used up all the memory, if you want (unless you're Cecil Taylor, this would probably take a while). Unit recording is limited to 100 bars; it also differs from track recording in allowing you to preset the Unit length. For both track and Unit you get a count-in (user-programmable from 0-8 bars), and a

metronome sound on every quarter note. This sound can be an internal beep or a MIDI event; for the latter, you can globally program the transmit channel, separate MIDI note numbers for the downbeat and subsequent beats in the bar, and a velocity amount. Maximum record resolution is 96ppqn, which is par for the course on stand-alone and workstation sequencers but a lot less than on many computer-based sequencers, and not enough to satisfy everyone - though enough to satisfy most, I'd venture.

Sectional recording in real time presents a bit of a problem. The reason is that whenever you start recording from partway through a track the PDC100 erases any data in the preceding bars of that track, while if you stop recording before the end of a track the sequencer deletes all the following bars in the track! Strange but true - and undocumented in the manual. It all seems too "clean" to be a software bug, though why on earth anyone would deliberately program this to happen I don't know. Fortunately there are ways to get round it (it seems you have to get round a lot of things on this sequencer). Perhaps the simplest is to record into one track and then Copy across to another, as Copying into a track doesn't get rid of anything before or after (but then it would be a pretty useless function if it did). Another way is to record a section directly into a Unit and then Copy or Place it into the relevant track, though in this case you lose the ability to record in the context of any other tracks.

"The sequencer not only automatically loads the next song in each time, it also automatically starts playing it."

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- *"Hey Kids! What time is it?"*

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A third way is to use punch in/out recording. However, as you can only use this *within* the recorded length of a track, how can you use it to add to an existing track? The best answer I can think of is that you create a "template" Song consisting of nothing but blank recorded bars, save it to disk and then load it in whenever you want to start working on a Song from scratch. In this way you can punch in/out at any position on any track, because, although it won't seem like it, you'll be recording *within* a track.

There are one or two important points to bear in mind about punch in/out recording, however. First, you have to preset the length of the punch in/out section. Second, if you Stop recording before the end of the section is reached, the PDC100 takes that Stop point to be the new end of the track you're recording into, and deletes anything that comes after it. This *is* documented in the manual - but sadly the reasoning behind it isn't.

Another point: constant use of punch in/out recording can get a bit tedious, because instead of being able to select punch in/out recording in place of real-time recording on the Normal (play/record) page, you have to go through about eight button-presses to reach a separate punch in/out page, record your section and then return to the Normal page (two dual button-presses) to be able to hear what you've just recorded.

Quantisation on the PDC100 is post-record only, and has none of the sophisticated humanising features found on many computer-based sequencing packages. You just select one of six quantisation values (quarter note, 8th, 8th triplet, 16th, 16th triplet or 32nd) and Execute the quantisation function. There are no regional or channel-specific quantise options, but once again you can "get round it" with a little ingenuity. One thing you can't get round is the PDC100's inability to timeslip tracks against one another, let alone time-slip individual notes (a useful feature for rhythm parts). Which is a shame, because you lose out on the ability to fine-tune the feel of a piece of music or to compensate for an instrument with a slow MIDI response time.

Step-time recording, which you can start and stop at any point in a track or Unit, allows you to program MIDI channel, step size, note velocity and note duration for each step. Duration can be set from 10-200% of step size, so you can overlap notes in step-time mode if you want. Notes are the only kind of MIDI data you can program in step time. To enter them into a step, you hold down the relevant note(s) on the keyboard and press the Execute button to advance to the next step; to program a rest you just press the Execute button while no notes are held

down. There's one problem with this method: if you want to program in a two-handed chord, you're in a catch 22 situation - you need to lift a hand off the keyboard to press the Execute button, but if you do that you won't be playing a two-handed chord when you press it. As this is a family magazine, we won't discuss the relative merits of using other appendages. The PDC100 should really let MIDI sustain pedal "take over" from the notes so you can lift your hands off the keyboard and press that Execute button.

EDITING

THE PDC100 IMPLEMENTS editing at both Bar and Event levels. At Bar level you can Insert, Delete and Copy bars in both tracks and Units, and Place Units into tracks. Copy allows you to copy any number of bars from one track to another, and from a track to a Unit or vice versa. However, you can't copy a section which includes Placed Units.

Event-level editing lets you get at the MIDI data in interpreted form - you don't have to know the status byte in hex for each type of MIDI event. The PDC100 is able to record note, controller, pitchbend, channel and polyphonic aftertouch, patch change and SysEx data, and lets you get at it all at the Event level (not that you want to edit raw SysEx data, but it can be reassuring to see it there). You can Change existing events and Insert new ones. The process of getting new events into the sequencer is a bit long-winded, as events are Inserted with a default value and you then have to select Change to be able to program in the value you want. To change the location of an existing event, you have to Insert a new event at the required location, program in the same value(s) and then, of course, delete the original event. Don't you just hate it when that happens?

More positively, the PDC100 transmits the event data as you scroll in either direction through it, while you can select the data type for Inserting by playing it on your main keyboard (moving the pitchbend wheel selects pitchbend, for instance).

Another edit mode, Modify, allows you to modify the MIDI channel and/or all occurrences of a specific data type within a track or Unit (though not SysEx, obviously). For notes, you select an offset value for the note numbers and either a selected absolute value or else a ratio (8/1, 4/1, 2/1, 1/2, 1/4, 1/8) for the velocity; for other data, the amount can be either Min, Max or a ratio. Note Modify provides a global transposition and/or change in velocity; however, if you select Drum you can transpose, and/or change the velocity of an individual note, which is ideal for rhythm parts.

To make regional Modify edits to a track, just Copy the required region into a Unit, Modify it and then Copy it back to the track.

MIDI FILTERING

THE PDC100 ALLOWS you to selectively filter out the various types of recordable MIDI data at the receive and/or transmit stages, to enable or disable

reception and/or transmission of each individual MIDI channel, to force all incoming data and/or outgoing data onto a specific MIDI channel (programmable per selected tracks in the case of outgoing), and to transpose note data on all outgoing MIDI channels (your singer wants to sing the song in a different key? No problem).

This last function allows you to set a single Pass channel which bypasses the transposition. Unless you're feeling adventurous, you would set this to your drums channel (if you've got more than one drums channel, you're in trouble).

All in all, these functions are a welcome inclusion on the PDC100, as they do add an extra degree of flexibility (such as making possible the "fudges" described earlier).

DISCORD

FILE SAVING TO disk is much slower than loading. For example, it takes a little under two-and-a-half minutes to save the full PDC100 memory, but just under 50 seconds to load it back in again.

The PDC100 allows you to save a single Preset file to each disk which contains global information such as count-in length, MIDI metronome settings, initial tempo, tempo changes on/off, soft Thru on/off and the various MIDI filter settings described above. The idea is that this is a setup file; if a disk is in the drive when you switch on the PDC100, its Preset file will be loaded automatically. A nice touch.

The only other file type is the Song file, which contains all the track and Unit data in memory at the time of Saving. The PDC100's memory isn't battery-backed, so if you don't Save before switching the sequencer off, you lose whatever you've been working on. Disk space permitting, you can save up to 32 Songs per floppy (a DSDD disk holds in the region of 39,400 notes). Each Song can be given a 12-character name, so you shouldn't have any trouble being able to identify each one.

As only one Song at a time can be in onboard memory, and there's no way of loading track data independently of Unit data or of loading individual tracks or Units, you can only bring together music from different Songs if you load in one Song, transfer the relevant track(s) and/or Unit(s) to another sequencer, load in another Song and then transfer the external data back in again. Not exactly ideal (especially if you don't have another sequencer).

The PDC100 allows you to automate Song loading and playing off disk using its Chain Play function, the idea being that you can play a live set without having to stop to load Songs individually. Unfortunately, with Chain Play you can't stop at all - the sequencer not only automatically loads the next song in each time, it also automatically starts playing it. So there you are, lapping up the ecstatic audience reception when all of a sudden the PDC100 launches into your next song for you. What's more, assuming you survive till the end of your set, unless you're quick on the Stop button the sequencer will launch into the first number of the set again. "OK folks, I just thought I'd do this song as an encore."

SYSEX DATAFILER

THE HISTORY OF stand-alone sequencers and System Exclusive file storage has not always been a happy one. Typically, the sequencers simply haven't had big enough MIDI input buffers to be able to cope with bulk SysEx dumps. There's no such problem on the PDC100, however: if you had a 128K SysEx dump (the size of the sequencer's memory) it would take it. Alternatively, you can transmit several smaller dumps in succession into it. As an example of the PDC100's SysEx capacity, it recorded a bulk dump of a full pattern memory and all associated parameters on a Yamaha RY30 drum machine (more than 40K) and still had 61% memory remaining. Useful or what?

The PDC100 doesn't have a separate SysEx mode. You just select a track to record into, start the sequencer recording, initiate a SysEx dump from your instrument, Stop the sequencer once the dump has finished, then Save the data to disk as a Song file. All you have to do subsequently is Load the file, hit Play and out your SysEx data goes to find its maker.

VERDICT

THE ONLY SERIOUS problem with the PDC100 is the situation with real-time recording - although you can get round it with some ingenuity and patience. As for Chain Play, you just have to accept that it's of no practical use. If Brother were to improve anything on the PDC100, it should be the real-time recording situation and Chain Play; unfortunately, they seem to be more inclined to bring out a new sequencer than upgrade an existing one.

The limited number of buttons and the 2 x 16-character LCD window do have a restricting effect - some functions could literally have been better implemented if there'd been more buttons, and room for more parameters in the LCD. And of course you have to accept the fact that the PDC100 doesn't exactly make the most of having a dedicated front panel (in particular, no dedicated track buttons for live mutes).

But while some features could have been better implemented - in the sense of being streamlined rather than rethought - there are a lot of well-implemented features, too, and the track/Unit architecture is particularly effective. Overall, there's a great deal of flexibility in the sequencer - even if a certain amount of it has to be arrived at by working around a number of limitations. And the fact that it's so compact and lightweight is appealing in itself. In fact, even if you use a computer-based sequencer you could find the PDC100 a useful alternative at times.

All in all, a 32-track sequencer with the PDC100's recording and editing features, a SysEx datafiler and a built-in disk drive, for around £350, has got to make Brother's latest sequencer current best buy in the budget stakes. ∎

"Even if you use a computer-based sequencer you could find the PDC100 a useful alternative at times."

what the hell does
QUANTISATION
think it is?

ALMOST ALL OF US USE QUANTISATION, BUT FEW OF US GET THE MOST FROM IT. THIS ARTICLE TAKES YOU THROUGH THE FINER POINTS OF ONE OF SEQUENCING'S MOST POWERFUL FEATURES. TEXT BY VIC LENNARD.

ALL SEQUENCERS ARE pretty much the same: they "record" the notes you play in from a keyboard and get it to play them back. Of course, we know that it isn't sounds being recorded, only the digital information created by pressing a key, moving a pitchbend wheel or stepping on a sustain pedal. But by recording in this way, we can keep our options open - we can change the sounds when the sequencer plays back, for instance, by using patch change messages. Sometimes notes are played in from a keyboard for other reasons than their actual pitch - most multitimbral synths dedicate a MIDI channel to the percussion sounds and then map them out along the keyboard. So Bottom C may be a bass drum, the D a tone above may be the snare drum and so on. The key to all this flexibility is our ability to edit the MIDI information in one way or another.

One of the most musically powerful forms of editing is quantisation. Let's take an example: you want to record 16th-note hi-hats, so you repeatedly press the key assigned to the hi-hat in time to the metronome. On playback, the chances are that the notes aren't quite where you intended them to be. You go to the quantise function on the sequencer and *voila* - it sounds even worse than it did before! But what does quantising actually do?

EVALUATION

QUANTISING IS WHAT happens when a sequencer moves notes to the nearest division of a bar; you decide what the value of that division is. If you quantise to 8ths, all notes will be moved to the nearest quaver, or eighth note. It's like having a grid where all events have to lie on the vertical lines. For instance, Figure 1 ➤

BAR	1				
BEAT	1	2	3	4	
A3					
G#3					
G3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
F#3					
F3					
E3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
D#3					
D3					
C#3					
C3	▬▬▬▬▬▬▬▬▬▬▬▬▬				

Fig 1

➤ shows a C major chord played on the downbeat of the bar (or at least that was the intention). Each crotchet, or quarter note, is divided into four so the vertical lines represent 16ths.

All the various types of quantising rely on this "movement" of events - if you choose the wrong quantise value, the result is not going to be what you wanted. No matter how intelligent the algorithms within a computer program, no computer (to date) can read your thoughts - so it doesn't know where you intended to play the notes. Figure 2 shows what happens if you select 16th-note quantise for the C major chord. Because the selected quantise value is wrong, one note has been moved to the desired position while the other two have been moved to the next 16th. However, quantising to 8ths gives the correct result (see Figure 3).

Quantising to the correct value may still leave some notes sounding as though they were played in the wrong place. This is because they have been played too far away from the desired point in the bar and, consequently, have been moved to another quantise position. Unless you can individually edit these notes - as you can on a "micro-edit" screen on a hardware sequencer, or via a note display page on a computer sequencer - you'll probably need to play them in again.

The secret is to figure out what is the smallest note value you intend to play. To do this, check the note value that your sequencer's metronome is ticking along to and listen to it. It's likely to be crotchets (quarter notes), for which it will sound four to each bar. Quite often, the metronome on the downbeat of the bar will be either louder than the rest, or a note of a different pitch. Tap the notes you have played against the metronome and decide how many times more frequently you're tapping; if it's twice, then you're using eighth notes; if it's four times, then you're using 16ths (semiquavers).

A helpful trick is to slow down the tempo when playing in fast passages such as certain drum parts. It's like trying to jump into a moving car - you have to judge the position of the open door, which is easier to do if the car is moving slowly. This is an effective practice, but it tends to remove the more subtle emotive qualities from the music. Many musicians would argue that playing should never be quantised, but more about this later.

OPTIONS

THE MOST COMMON type of quantising is one where the Note On is moved to the nearest quantise position. However, there are three possible effects on the Note Offs:

The Note Off doesn't move: This method of quantisation changes the note length. While there may be circumstances where you may want to keep the Note Off in its played position, these are rare. This is shown in Figures 2 and 3.

The Note Off moves with the Note On: This keeps the note length the same. In the playing of a drum part, note lengths are likely to be irrelevant, as most drum sounds work on a "one-shot" principle, where the sound plays for its full length irrespective of when the Note Off is received. See Figure 4 for the C major chord example.

The Note Off is quantised as well: This not only changes the note length but as each Note Off will be moved differently, it does so in an inconsistent way (Figure 5). For chords, this is rarely used, but for a solo it might be useful. If the intention was to play the solo in a legato manner (where each Note Off is butted up to the next Note On), then this type of quantisation will produce the required result. Unfortunately, the same quantise value is

Fig 2

BAR	1				
BEAT	1	2	3	4	
A3					
G#3					
G3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
F#3					
F3					
E3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
D#3					
D3					
C#3					
C3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬				

Fig 3

BAR	1				
BEAT	1	2	3	4	
A3					
G#3					
G3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
F#3					
F3					
E3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
D#3					
D3					
C#3					
C3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬				

Fig 4

BAR	1				
BEAT	1	2	3	4	
A3					
G#3					
G3	▬▬▬▬▬▬▬▬▬▬▬▬▬▬				
F#3					
F3					
E3	▬▬▬▬▬▬▬▬▬▬▬▬▬				
D#3					
D3					
C#3					
C3	▬▬▬▬▬▬▬▬▬▬▬▬▬				

usually used for Note On and Off so unless the part has been played in accurately, the Note Off quantise is unlikely to produce correct legato - some Notes Off will be quantised to the wrong position.

INTELLIGENCE

MOST OF THE more expensive computer sequencers offer different types of quantisation. These do more than just move Notes On and Off, and so are flexible and often more useful.

The Over Quantise in Steinberg's Cubase uses the quantise value you select but takes into account whether you play in front of, or behind the beat. It then attempts to retain the "feel" of your music

within which notes are not moved, and then set a percentage movement towards the quantise position for the remaining notes. A setting of 50% will move a note halfway between its current position and the quantise position. Creator/Notator's Capture Quantise works the other way round: if a note is within the capture range it is moved, otherwise it's left untouched. This function uses percentage movement in the same way as Iterative Quantise.

Sometimes, you know what feel you want but can't play it in. Both Creator/Notator and Cubase offer a Groove Quantise option in which a preset "template" is used. This template is a pattern where the quantise positions are in odd and exotic places. The success of the result still depends largely on how accurately you have played in the original part, however, because various

quantise positions. The quantise value you set then determines which notes of another part are moved to the reference positions.

Creator/Notator allows you to take this idea further with its Adaptive Groove function. This uses seven parameters to seriously reshape your playing, although the muso fraternity would certainly argue that the time taken to get to grips with a function like this would be better spent brushing up your playing technique.

DECISIONS

DECIDING WHETHER OR not to hit the quantise button depends largely on whether your sequencer also gives you the option to "undo" quantising. Most computer sequencers do whereas most hardware sequencers don't. If you can't undo an operation which can have drastic effects on your sequence, you're well advised to make a copy of the part you're about to alter before proceeding. If you can select and change quantise values while your sequencer is playing back, this will give you an immediate idea of whether or not you're doing the right thing. If not, then it's play, stop, quantise, play, stop, change, play, stop. . .

Another approach to quantising is to use an auto-quantise function. These are most useful when recording drum parts in "loop in overdub" mode, because there are few things worse than trying to build up a drum part when each part is out of sync with every other. Each time the part loops round, what you hear has already been quantised. You can usually change the quantise value from one cycle to the next, but make certain that this too can be undone, otherwise the wrong quantise value will ruin your "take". You won't get a second chance.

Finally, remember that the timing inaccuracies caused by the queueing up of MIDI data (due to MIDI's serial nature) and the reaction time of your multitimbral synths is likely to adversely affect the nuances which can be achieved with some of the complex quantisation methods. Sometimes the simplest solutions are the best; Note On quantise with no change of note length will do the job in most cases. But then, technology is there to be used. . .   ∎

Fig 5

BAR	1				
BEAT	1	2	3	4	
A3					
G#3					
G3					
F#3					
F3					
E3					
D#3					
D3					
C#3					
C3					

and will even line up the Notes On of chords. The Musical Quantise II feature found on C-Lab's Creator/Notator is a similar function, and uses the timing of notes around the quantise positions to decide how best to move note events. Notes played behind the beat will be pulled forward and vice versa - this produces the possibility of actually changing the playing style of someone who wants to sound "lazy". Consequently, intelligent quantisation functions often have problems handling your style if your playing is too erratic.

Another quantisation option is to leave notes which are close to the quantise position unchanged, and to move notes which are further away towards the quantise position. Cubase's Iterative Quantise works in this way: you set a number of ticks (192 ticks = a quarter note) distance from the quantise position

types of tuplet (triplets, 5ths, 7ths) feel may have to be dealt with, and misinterpretation of the original musical intention is all too easy.

Now let's take a situation where a pianist has played in a part which has excellent feel and where you want to take that feel and impose it on a string part playing alongside. Creator/Notator's User-defined Groove is intended specifically for this. It analyses the timing of the piano part, uses it as a template and attempts to quantise the strings using the same parameters as for Capture Quantise (see above). It also has the ability to change the velocities of the notes in a similar fashion. Cubase's Match Quantise is a simpler function which is intended primarily for use with drum parts. The notes in the reference track need to be pretty regular (like a hi-hat for instance), and these "pulses" are then used as the

VIRTUAL WAVE

Info Options Create Setup Send Utilities   Wave Page Selected

Patch : BELISIMO   1 2 3 4   Waves Used : 1-8
                          5 6 7 8

LIBRARY CREATE MODIFY SPECIAL MOVE ZOOM IN

As more musicians choose a computer and sampler as the basis of their music system, the need for a computer program capable of synthesising sounds grows. Enter Virtual Wave. Review by Vic Lennard.

L USH SYNTH BRASS, warm string pad, percussive bell tine; what do they all have in common? Well, they're all created from a mixture of waveforms. If you've worked with, or even just listened to, an analogue synth, you'll be aware of the various waveforms and their uses.

On its own, a sine wave has a rather pure, characterless timbre. However, by combining waveforms, complex sounds can be created from simple waves. Usually, this is carried out on a synth which has wave generators built in. The resulting sounds are manipulated by envelopes, which alter levels according to time (commonly, the Attack time, Decay level, Sustain level and Release time) and filters, which change the tone of the sound over a period of time. Digitally-created sounds employ a variety of systems including FM (Yamaha) and LA (Roland) synthesis.

One neglected area of synthesis is that of waveform manipulation on samplers. While most samplers offer basic envelope and filter options, it's difficult to create complex waves. Various pieces of computer software have appeared - Samplemaker, to name one - which let you construct a waveform and download it to a sampler, but these tend to be very difficult to use unless you have a good working knowledge of synthesis.

OVERVIEW

VIRTUAL WAVE (VW) is a sample creation and synthesis program for the Atari ST; you create a sample by defining up to eight waveforms which occur at a moment in time, and the time taken to smoothly move between these waves. The sample is then synthesised from these and transmitted to a sampler for playback and further manipulation. Because the final waveform of the sample is not the synthesised sound, the ST disk space taken up by the waveform data is small; consequently, even though the actual sample is, perhaps, three seconds long, you will still be able to fit 15 or 20 waveforms on a single ST disk.

As up to eight different waveforms can be used, there may be up to seven smooth transitions from one waveform to the next. You can control the level and pitch changes that occur in these transition periods and control the editing of the basic waveforms used.

Virtual wave is not copy-protected. Instead, the serial number of the disk is indelibly printed within ➤

the program, which means that pirate copies can be easily traced back to the purchaser.

Practically all menu options have keyboard equivalents and comments appear in the top right-hand corner of the screen to tell you what page you're on or what procedure is currently being carried out.

CONSTRUCTION TIME

ON BOOTING UP, you meet the Wave Page. This has eight windows (each of a basic 3.82ms duration) for the eight different waveforms; the overall sound is referred to as a Patch. Beneath the waveform windows are eight numbered boxes which are used for selecting a particular window but as you can select a window by simply clicking on it, the necessity of this pad is dubious. At the bottom of the screen are six menu buttons which access the various editing functions.

The basic building block for each waveform is kept in the Library. From here, you select between Sawtooth, Triangle, Square, Sine, Exponential and Pulse 1-3 waves, Noise and Silence. The three pulse waves differ in that the first is positive going, the second alternatively positive and negative going, and the third is a bipolar positive and negative-going pulse; you enter the pulse width that you want.

Once you've selected the basic wave, you then Modify it. Reverse reflects the waveform about an imaginary vertical axis in the centre of the wave window, while Invert reflects about a similar horizontal axis. While these have little effect on the sound of the basic waves, they are important tools when carrying out further modifications. Phase Adjust moves the wave along the time axis; this can be used to great effect when waves are added to or subtracted from each other. Amplitude Scale adjusts the level of all points on the wave to make the overall amplitude larger or smaller. If waveforms are to be combined, reducing the individual amplitudes will prevent clipping. Frequency Multiply changes the period of the wave. Consequently, it changes the fundamental frequency. Finally, Normalise Amplitude increases the amplitude of the highest point of the wave to a point just before clipping, and increases all other points proportionally. This can be used after functions which excessively increase the amplitude of a wave.

The above are common functions to carry out on a wave. Under the Special menu are others which have more specific uses. Amplitude Ramp Up/Down changes the level of a wave according to a scaling factor. For instance, a Ramp Up of 50% will scale the amplitude of the wave down to 50% at its starting point. Frequency Ramp Up lets you decide how many wavelengths are squeezed into the original wavelength, with each new wavelength being a fraction of the previous one. This creates resonant peaks in the sound. Taking a sine wave and using a Ramp factor of five creates an oboe-like timbre.

Smooth does what it purports to - it affects sharply-changing parts of the wave by a degree which you control via the percentage factor. Smoothing the above oboe-like timbre removes much of the resonance. The higher the Ramp factor, the longer the time taken to carry out the operation. One hundred percent smoothing takes a little short of ten minutes; consequently, there's an Abort button which restores the original wave.

The final option here is Splice, which lets you take two different waves and join them one after the other. Each wave is then reduced to half of its wavelength, which makes it sound an octave higher.

One gripe I have is that there's no Undo function - you have to copy a wave to another of the eight boxes before carrying out any modification otherwise it is lost. Copy is one of the functions offered in the Move menu and lets you select any current wave and copy it to another window, while Swap makes the obvious exchange of waves. Add lets you select two waves, add together multiples of each sample point in a ratio (which you select) and then place the result in another window. A ratio of 1:1 adds two waves in equal amounts. Subtract inverts the first waveform and then follows the same procedure as Add.

As the ST Monitor resolution is far less than the resolution of the samples being created, Zoom In allows you to see a wave enlarged by a factor of three. You can also flip between the different windows without having to exit from the zoom screen.

CREATING CUSTOMS

BY ADDING WAVES, it should be possible to create practically any waveform. Virtual Wave allows you to combine any of the current eight waves and, while this particular facility is probably the most powerful available, it's also the most difficult to control.

Clicking on Select Fundamental brings up a dialogue box giving you the option to use a sine wave or waves 1-8 as the basic building block. Having selected a wave, Starting Harmonic lets you select the lowest harmonic to be used. Using 1.0 will keep the root frequency of the original wave. Maximum Harmonic gives the upper limit of the harmonic range used; working with a sample whose starting frequency is, say, 100Hz, the first harmonic would be 200Hz, the second 400Hz and so on. Using an audio range of about 20kHz, harmonics beyond the 200th would be inaudible. More to the point, the anti-aliasing filters in the sampler would remove them. Also, the higher the number of harmonics, the longer the time taken to create the wave. Harmonic Step then lets you set which harmonics are to be used for calculation; selecting a figure of 3.0 would give the 1st, 4th, 7th and so on. For non-linear steps, there is a Step Increase function. Other setup functions include Starting Phase, Phase Step Offset and Scale Amplitude. Most parameters deal in integral values, but the program gives you the option of using fractional values for interesting effects.

Finally, you have to select the Harmonic Divisor. This sets up the way in which the amplitude changes from one harmonic to the next; effectively, the amplitude is divided by a number over which you have control. Six options are offered: Harmonic, Harmonic Squared, Root of Harmonic, Step Count, Random and None. For instance, selecting Harmonic Squared will mean that the 2nd harmonic will have its amplitude ➤

"After three days working with Virtual Wave, I have to admit to being very impressed - I spent three weeks with Samplemaker and got nowhere."

➤ decreased by a factor of ¼ while the 3rd harmonic will have an amplitude of ⅛ of the original. Consequently, the character of the sound will be less bright as the higher harmonics diminish. Alternatively, Root of

Harmonic decreases the divisor, giving an increase in the amplitude of higher harmonics and a brighter sound.

Once the settings are complete, OK makes the Create Additive Synthesis Monitor pop up. This uses a horizontal meter, marked in percentage points, to show you how far through the creation process you currently are. The result is then displayed in the current window and you can continue to modify as you wish.

LISTENING IN

ALTHOUGH INDIVIDUAL WAVES are only the foundations of the final sample, chances are that you'll wish to hear them as you go along. The Setup menu lets you select which sampler is connected to the other end of the MIDI cables (current options are Sample Dump Standard 12/16-bit, Akai S900/950 and Ensoniq EPS range) and to set any parameters which the selected sampler requires. You can then choose a number of times to loop the wave; this is essential, as the wave only has a basic length of less than 4ms. Such a dump takes very little time, and a similar meter to the one in the Create process is used to visually show you the progress.

Once in the sampler, the wave can be looped and you can hear its character. Doing this with the S900, setting the loop points to the entire length of the sample produced a perfect replay.

PUTTING IT TOGETHER

HAVING CREATED THE individual waves, the Patch Page lets you dictate the pitch and level for each wave. The transition from one wave to the next will then smoothly move between the values you set.

On entering the page, the top of the screen shows a linear chain giving the relative pitch of each wave and the time taken to move between one wave and the next. Below this is a Pitch/Time graph showing the same data visually with the central, horizontal line bearing the root MIDI note and associated frequency. Pitch is changed in terms of semitones and cents rather than just numbers; a good idea. Clicking on the

word "pitch" in any of the eight boxes makes the pitch boxes change to level boxes where you can set the percentage level for each wave. The graph changes to Level/Time. For both modes, the total duration of the sample is shown at the bottom of the graph. Unfortunately, you can't edit the values by just pulling about the points on the graph; this would be a useful feature because often it is easier to set parameters visually rather than deal in actual numbers. Data is displayed sensibly on these two graphs. On the Pitch graph, the vertical limits are set according to the maximum change of pitch, giving the best vertical resolution.

Resotek use a neat method to change parameters. Point at the digit you wish to change and a two way vertical arrow appears; move upwards and this changes to an upward arrow and the digit increases in value. Decrementing is done similarly. Neat though this is, it takes a bit of getting used to and I'd prefer the option to type in the value as well.

You can decide on the number of waves in the line at any time; clicking on a wave number turns off all waves after this point.

THE FINAL PATCH

BEFORE TRANSFERRING THE Patch to the sampler, you can see how the waveform changes over to time on the Preview Page. This shows seven graphs, each the width of the screen and relating to one of the transitions. They are either a white trace on a black background if the wave is in use, or vice versa if the wave has been turned off. Buttons along the bottom of the screen let you choose to view all transitions, or to view just one, spread over the seven graphs. You can select a transition and hit the Do button to see its graph, and then select another transition and see that.

Pitch isn't displayed; all you see is the smooth (or otherwise) transition from one wave to the next. This makes it easy to see what is happening to the amplitude of the sound - it's an important factor, because if you're moving from one wave to another which is basically the inverse of the first, at one point the waves will phase cancel giving a signal of very low amplitude. With these graphs, you will see if this is happening. You can also set how many cycles are shown across the graph; using a small number of cycles will show the waveform clearly, but may not let you see any amplitude problems occurring. For this, a higher number of cycles is useful.

MODIFICATION

SAMPLERS HAVE FINITE polyphony; in the case of Akai's S900/950, this is eight voices. Consequently, to fatten a sound by using two samples, with one detuned, halves the polyphony to a not-very-useful four notes.

To get around this, Virtual Wave has an Effects Stage where the final sample can be duplicated up to five times and each replica can be changed in pitch and level. The duplicates can then be mixed together, creating some of the effects which would otherwise "cost" polyphony.

Imagine that you want to add a detuned version to a sample. Clicking on Source 2 makes it active so that you can alter the pitch by a number of cents. If you want, you can also reduce the level, given as a percentage of the final sample. Alternatively, you might wish to create an octave brass sound, in which case Source 2 will have its pitch set to +12 semitones. You may even want to send a completed chord across to the sampler; the intervals can be set for two, three or four of the sources. It's a shame that a delay facility isn't offered as well, but you can't have everything.

Needless to say, more complexity directly equates to time required to send the Patch to the sampler. You have been warned.

BYE BYE ST

HAVING CREATED THE sample (and saved it to disk), you need to transfer it to your sampler. The chances are that you've already transferred individual waves to your sampler to hear them. If so, the transfer parameters for your sampler will already have been set. These include whether or not you wish to use handshaking, which is a two-way MIDI connection between the ST and the sampler. Some samplers only work in handshake mode, transmitting an Acknowledgment message (ACK) after each block of data. Some samplers don't care. The point of using handshaking is that the dump tends to be more reliable; if an error does occur, the faulty block of data is usually re-transmitted.

Non-handshaking often gives faster transmission rates because there's no waiting for ACK messages. However, this is only useful when data is being sent as fast as MIDI can handle it, which is not the case with VW. The sample is being synthesised as the data is sent, which means that something less than 15% of the available MIDI bandwidth is actually used. So, it seems to be best to leave handshaking on all of the time.

On dumping the data, the horizontal percentage meter tells you how far through the data dump is - it would be more helpful to be given an estimate of the actual time, as large samples can take in excess of ten minutes, but with samplers using the MIDI Sample Dump Standard this would be impractical. This is because the time taken for the ACK to be transmitted is variable from one sampler to another.

One variable you can set is the Sample Rate. This should be the same as the playback rate on the sampler if the pitch of the created sample is to be played back correctly. This is often only critical if the sampling rate has, say, only one or two values. In the case of the Akai S900 the maximum sampling rate is 40kHz due to the anti-aliasing filters on the input, but this doesn't apply to data transferred via MIDI - you can set the rate to 48kHz and get better quality audio as a result. You really do need to know your sampler. Details are usually given at the rear of the manual.

The only other gripe I have is the inability to set loops within Virtual Wave. I appreciate that samplers supporting Sample Dump Standard may treat looping in different ways, and that some samplers support

multiple loops while others don't, but it would be useful to be able to set a sustain loop of a particular transition. On supported samplers such as the Akais and Ensoniqs, such a looping facility should not be impossible.

OTHER FACILITIES

YOU DON'T NEED to have a keyboard connected to hear the sound once it's downloaded to your sampler; Virtual Keyboard gives you an onscreen, seven-octave keyboard which can be played via the mouse. There's also a Print Screen option which is effectively the same as pressing the Alternate + Help buttons on the ST (Epson nine-pin job). Finally, there's an onboard help file which dedicates a page to each of the most common functions.

The manual is written in a non-technical manner and includes 16 pages of hints and tips for wave creation/editing and downloading to specific samplers. Bearing in mind the complexity of wave creating and sound synthesis, Resotek have done a very good job in this area. It also gives a good indication as to whom VW is aimed at.

VERDICT

AFTER SPENDING THREE days doing practically nothing but working with VW, I have to admit to being very impressed (I spent three weeks with Samplemaker and got nowhere). The results with an S900 were very good, including setting up multisamples across the keyboard by simply changing the root note of a sample before transfer to the sampler. Looping on the S900 was also fine as long as the final level was set flat, and was of sufficient length to be "loopable".

The Effect Stage gave great results; the saving on polyphony is well worth the bother. Previously, I have resorted to using a digital delay or even two samplers to re-record a sample with effects to prevent this reduction in polyphony. Either way, the sound was compromised. Not with VW.

Since a sample is synthesised as it's being transferred, transmission is slow. It's also because the sample needs to be synthesised that an audition feature within the program is impractical - you'd still have to wait even without transfer to a sampler. Other gripes include the lack of an "expert" mode (all screen exit options favour the cautious choice) and the lack of being able to set a hard drive path (VW always looks at drive A for waves and patches). These and the other small points brought up in the review apart, VW is a well-written, user-friendly program which gives good results without a great deal of head-scratching.

Virtual Wave deserves to do well. If you enjoy creating your own sounds and have a sampler as the mainstay of your system - as is becoming increasingly the case - check it out. ∎

"The Effect Stage gave great results - previously, I have resorted to using a digital delay or even two samplers to re-record a sample with effects."

VOCAL CODES *from the* *underground*

> Cliff Richard uses one. Today, with vocoding re-emerging in the shape of Roland's own Boss SE50 effects unit and the Korg Wavestation A/D, it's worth looking back at the VP330 to see just what made it (and still makes it) such a desirable instrument.

ELECTRONIC MELLOTRON

THE VP330 ISN'T a large keyboard by modern standards. Sporting a four-octave keyboard which is, inevitably, neither velocity- nor pressure-sensitive, it's very similar in size and chunkiness to other popular keyboards of the time such as the ARP Omni II string machine and the Korg CX3 organ. You know the type: wooden end-cheeks, fixed mains lead, and two holes for your music stand. The clearly laid-out control panel sports large, friendly rocker switches to activate the voices (although these were replaced on final

"FOR THE FIRST TIME CHORAL VOICES WERE EMANATING FROM A KEYBOARD THAT DIDN'T WEIGH A HUNDREDWEIGHT YET STILL HAD TO BE HANDLED LIKE A MING VASE."

models with LED momentary switches), and a selection of typical Roland sliders and knobs control the various facilities provided by the instrument's three sections. Three sections? But surely this is just a Vocoder, like its rack-mounted stablemate, the SVC350. Well, not exactly. . .

A good starting point for understanding the VP is the Strings section. The late '70s were the heyday of the string machine and, whether it was purely a marketing ploy or whether Roland appreciated how useful the Strings would be when combined with the Vocoder section, we can now only guess. But, if you look closely at the architecture of the VP330, you'll find that it readily lends itself to the creation of a string ensemble effect. This is because the sound generators within the instrument use the octave-divide technology commonly found in electronic organs and so-called string machines of the day. The rather thin but harmonically rich output from these oscillators is an ideal starting point for the

creation of ensemble-type effects and, as we shall see, choral style voices. Only the treatment varies between sections. The Strings section offers just one footage (8'), plus variable attack, a release control (which is shared by the rest of the instrument) and a tone control. There's also a preset keyboard split, either side of which the voice can be turned on or off. You may laugh, but these were reasonable facilities back in the Pleistocene era. Indeed, the fondly-remembered RS505 Paraphonic Ensemble contained many similarities to the VP330 Strings section - not least of which was the sound.

The next section is Human Voice; when the VP was launched, this was greeted with amazement. The basic waveform is filtered to give a vocal, if somewhat nasal, formant. On its own, this doesn't sound like people singing, but the VP also includes an Ensemble button which introduces a complex series of pitch modulations to the basic sound. Stereo outputs are provided to create a more spacious sound when Ensemble is selected (which is, for most purposes, all the time) and these contribute to thickening things up considerably. The result is almost voice-like, and extremely usable. For the first time choral voices were emanating from a keyboard that didn't weigh a hundredweight yet still had to be handled like a Ming vase. The VP330 was hailed as the electronic musician's replacement for the Mellotron.

Like the Strings section, the Human Voice is split at middle C. Unlike the Strings, however, it provides different timbres on either side of the split: 4' and 8' male voices in the Lower register; and 8' males and 4' females in the Upper; and Vibrato, with rate, delay, and depth controls. This, when coupled with the Strings, emulates several well-known Mellotron tapes - eight-voice choir, 16-voice male and female choir, and 16-voice choir with strings. A minor disappointment is the inability of the VP to output the patches from either side of the split point separately via the stereo outputs (this would have made it possible to imitate the enormous dual manual Mellotron Mk 2s of the early '60s) but nobody seemed to mind - replacing the model 400s and Novatrons seemed quite satisfactory to everyone concerned. That's not to say that the Roland has no character of its own. It has, but the Mellotron was still big news in the '70s, and its imitation was the most obvious benefit provided by the Strings and Human Voice.

It's not easy to sample and loop pitch-modulated sounds but, surprisingly, the VP330 Strings and Human Voice sections sample extremely well - especially

if multisampling is used to avoid munchkinisation. Roland's own sample library begins with disk L501-0005, which includes two excellent Strings and Human Voice samples. But you needn't settle for simple reproductions of the VP330. A good sampler will offer extensive enveloping and filtering options, allowing you to take the basic sound and develop it in ways that were impossible back in 1979. In fact, once you start sampling the VP, there's nothing (except limited memory) to stop you from spinning entire vocoded phrases to disk. The possibilities are legless (?).

VOCODING

LET'S MOVE ON to the *raison d'etre* of the VP330 - the Vocoder section. This shares many features with the other sections: variable attack and release sliders, middle C split point, Upper and Lower on/off controls, Vibrato and Ensemble. There is also a pitch-shifter offering Manual and Auto modes. Manual is useful, Auto less so, unless you're into synths that make you go "hmmm". But whereas the Strings and Human Voice sections create their sounds by treating the internal oscillators with constant effects (filtering and ensemble), the Vocoder section enables you to modulate the oscillators with an infinitely variable source - the input from a microphone. Even greater flexibility is added by the External Synth input, which allows any sound source to be submitted to the vocoding process. This means that you can treat your favourite guitar riffs, piano sonatas, synthesiser voices - or even the music from your CD player.

Vocoders are probably best known for such ditties as 'Mr Blue Sky' and 'Sparky's Magic Piano'. Instantly recognisable as vocoders, these sounds have now become dated and dreary. Consequently, vocoding is usually dismissed as another boring '70s phenomenon. Yet vocoders can be used in many other ways. Replacing conventional backing vocals using a vocoder can be very rewarding, especially if you're recording on a limited budget and don't have access to a fully-equipped multitrack studio. You can play far more complex parts on the vocoder keyboard (including chords) than you can manage unassisted. And, if you want to get away from the natural sound of the human voice but retain recognisable words and phrases, you can create new textures using the External Synth capability of the VP330.

Double tracking lead vocals is another interesting application, especially when the VP is coupled to an external effects unit. The most common of these ➤

techniques works as follows: take a side-chain from the vocal channel off tape, compress it, delay it by a few hundred milliseconds, and then vocode it. Adding this (plus a bit of reverb) to the original signal results in a very expensive sound - similar to double tracking, but with a unique "thickening" effect.

A third area of vocoder use that hasn't received the attention it deserves (although this may change with the arrival of the Wavestation A/D) is the creation of the unusual polyrhythmic and tonal effects generated when you pass non-vocal signals into both the External Synth and Microphone inputs. Since the VP330 mic input has both quarter-inch unbalanced and XLR balanced sockets, it

"IN THE VP330, ROLAND MANAGED TO PRODUCE WHAT IS, FOR MANY USERS, STILL THE SMOOTHEST AND SWEETEST-SOUNDING VOCODER EVER TO HAVE BEEN BUILT."

will accept almost anything you care to send it. Vocoding these non-vocal signals using the internal oscillator bank suggests one range of options, but replacing the internal bank using External Synth places another, even wider, range of sounds at your disposal. Experimenting with rhythmic inputs, synthesised timbres, random or arpeggiated sounds, or even film and video soundtracks, can yield surprising results. And if you're looking for the next innovation in dance or electro-pop, vocoding Star Trek episodes with Pascal Gabriel's rhythm samples could be what you're looking for. Finally, for those of you into the occult, try

vocoding a vocal with itself - the result is seriously weird.

Although these ideas have been discussed in a studio context, there's nothing to stop you trying them on stage. But be ready to face some unusual problems. The vocoder is not simply a keyboard - it has a microphone attached to it - so you're going to have to think about placement, feedback, and the dangers of extraneous sounds getting into it. If you're tempted to try live vocoding, use a good headset microphone in conjunction with a sensible monitor mix. In addition, a good limiter is almost essential to get professional-sounding results. Finally, it's a mistake to believe that you can simply speak your lyrics into a vocoder and the machine will sort everything else out for you. Vocoders are, after all, only sophisticated filters which enhance or suppress natural frequencies present in your voice, so you'll get far better results if you actually sing the intended part correctly.

ON RECORD

DESPITE THE POWER and transparency of its vocal processing abilities, it's not as a vocoder that the VP330 is best remembered. And, although very few people would claim that, in its Strings and Human Voice modes, it actually replaced the Mellotron (that happened later with the advent of samplers) it's in this role that you're most likely to hear one used. The Mellotron (and later, the Novatron) were the instruments of choice for a whole generation of players but they were notoriously unreliable. Given the choice of fighting with sticking tapes, burnt-out motors, and stuck keys, or simply plugging in the VP and playing, many bands opted for the latter - often ignoring its vocoding capabilities altogether. A notable example of this was Tony Banks of Genesis, who replaced his Mellotron with a VP for the Duke tour of 1980. In the studio Vangelis used one extensively on the See You Later LP, and made the Human Voice world famous with his Oscar-winning Chariots of Fire filmscore. See You Later also formed the basis for the soundtrack of Blade Runner, thus giving the instrument even wider exposure. Picking up almost any Tomita album will also give you a sizeable dose of VP330 choral sounds. Perhaps one of the few groups to use the full range of the VP's capabilities (both in the studio and on stage) was the Steve Hackett band. But even they dumped their Mellotron once they started using the VP330 for live work.

VOCODING THE FUTURE

THE VOCODER IS enjoying something of a renaissance at the moment. Whether this is because of the new and more affordable units now available, or whether these instruments have been released as a consequence of the revival in interest, is unclear. Either way, players now have a wider choice of instruments than ever before. The Boss SE50 offers basic facilities and retails for under £400 (and you get a digital effects unit thrown in for free), while the Wavestation A/D and current generation of EMS instruments give you better quality and more facilities for closer to £2000. Add to these choices the thriving secondhand market - hardly a month passes without a Music Technology Readers' Ad pleading for a used vocoder. On the rare occasions that you see a VP330 for sale the asking price will be in the region of £450. Compare this to the asking prices for the Korg VC10 (about £150) or the SVC350 (£250-£300) and you get some idea of just how highly rated the VP330 has remained. The reason for this is its quality; cheap vocoders can suffer from tracking and glitching problems, and the clarity of the output signal is often very poor. In the VP330, Roland managed to produce what is, for many users, still the smoothest and sweetest-sounding vocoder ever to have been built. Using ten frequency bands, plus a blue noise sibilant generator, it never fails to reproduce the signal, and maintains enough clarity for lyrics to be understood following treatment.

Nowadays it's possible to have the VP upgraded to accept MIDI. Kenton Electronics provide just such an upgrade for £160, and this sees MIDI In and Thru ports emerging (literally) from the woodwork. Imagine the fun you could have vocoding the output of, say, a sequenced D50 or DX7 (input via the External Synth port) while the keyboard part of the VP330 is itself sequenced. You can even add Strings or Human Voices above or below the Split Point, or in unison with the vocoded parts. And, although the VP doesn't sport trendy individual audio outputs, a mixer is included, which enables you to balance the outputs from the three sections. Creative or what?

If you're over 21 years old and you feel like a bit of private (or even public) vocoding, you could do worse than track down a VP330. Each of its three sections would have stood up as separate keyboard instruments when it was launched in 1979. Combined, they create a whole that is undoubtedly greater than the parts. And it's still considered by many to be the best there is. ∎

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D4 DRUM MODULE

Certain recent additions to the drum machine market have been notable for the sheer numbers of sounds they contain - Alesis' D4 boasts over 500 and there's more. . . Review by Tim Goodyer.

THE ALESIS D4 is useless. Useless, that is, if you're a confirmed sticks-n-skins drummer. If, on the other hand, you're in the market for a large and diverse collection of sampled drum and percussion sounds, tidily packaged in a 1U-high rack unit and equipped with trigger-to-MIDI inputs, the D4 might - just might - turn out to be more useful than your pacemaker.

So here it is, check it out; 99 bass drums, 99 snares, 55 cymbals, 92 toms, 76 assorted percussion voices, 80 "effects" sampled in glorious stereo at 48kHz, packed into a single rack space complete with 12 trigger-to-MIDI inputs equally suited to use with drum pads, drum machines and signals on tape. Feel free to turn the page if you still think drums have the monopoly on rhythm or you really are prepared to miss out on one of the neatest

beatboxes to appear in quite a while.

Actually, the term "beatbox" doesn't quite fit the D4, since one of the few things it's lacking is onboard sequencing. As such, it's not so much a drum machine as a dedicated percussion sample reader. Where the D4 scores over certain other drum expanders, however, is through its integral trigger interface. This makes the unit equally well-suited to use with an acoustic drum kit fitted with piezo mics and as a means of replacing poorly-recorded or damaged drums on a studio multitrack.

HARD WORK

TAKING A MORE thorough look over the D4's hardware, we find a 1U-high rackmount whose front panel (from left to right) boasts a headphone socket, volume control; 32-character, two-line, backlit LCD; alpha wheel-style Data knob; large Preview button; left and right cursor buttons; ten function buttons

(with active LED bars) and a power button. On the rear panel there is a socket for the separate transformer (supplied) footswitch jack, MIDI In and Out/Thru sockets, 12 Trigger Input jacks, Main stereo audio output pair and Aux audio output pair (on quarter-inch jacks. And that's it.

Alesis have commendably kept the number of "second page" functions small, leaving you to navigate the operating system with the cursor keys instead. Where this doesn't offer much of an improvement in the use of most synth or sample expanders, the D4's operation is simple enough (for the most part) to be quite intuitive. For most aspects of operation, only details of the 25 trigger types and the Group setup button really require you to refer to the manual.

SOFTWORK

ON POWER UP, the D4 greets you by telling you what it is and who made it (in case you've lost the box). Then it picks up on the page you were last working on. In the case of a brand new D4, this is the first of the unit's 21 Drumsets - Drumset 00 "Standard Stuff". Each Drumset is an assigment of 60 of the D4's 501 samples to 60 consecutive MIDI Note Numbers. The unit comes set up with what Alesis have called the Drumset Root Note at #36, but this can be changed to anything between #000 and 76 - which would put the highest D4 sound at MIDI's upper limit, Note #127.

It hardly needs to be stated, but the D4 happily operates on any of MIDI's 16 channels or in Omni mode. Also to be found under the button marked MIDI is the soft Thru on/off setting, program change enable/disable, MIDI controller enable/disable, program change number mapping and SysEx dumping. The D4 accepts Controller #6 incoming over MIDI as an alternative to its own data wheel. It will also respond to Controller #7 (volume), data increment and decrement (these act upon the currently-selected parameter), Non-Registered Parameters 98 (MSB) and 99 (LSB) which select the parameter to be edited by Controller #6, Reset All Controllers

and Pitch Bend messages. It's worth noting that pitchbend only affects sounds *before* they're triggered. The default setting of the program change mapping simply cycles through the D4's 21 Drumsets (programs 00-20) every 21 patch numbers - so patch 20 is Drumset 20, patch 21 is Drumset 00 and so on.

Saving data via MIDI covers saving of the D4's entire setup memory, as you'd expect, but also allows you to dump the edit buffer, trigger setup and program table as separate files.

SET WORK

ASSEMBLING DRUMSETS FROM the D4's 501-sound library couldn't really be much simpler. Hitting the button marked Drumset allows you to step through the Drumsets with the Data knob - which, incidentally, is "stepped" so that incrementing or decrementing an entry is a comfortable, precise affair. The Set in the display is active and the one you go on to edit if you press the Voice button.

Pressing Voice causes the display to show the currently-selected Note Number and its pitch on the top line, while the sound category (Kik, Snr, Cym, Tom, Prc or Efx), number and name occupy the bottom line. The Data knob scrolls through the active range of MIDI Note Numbers, the sound category or sound number, dependent upon where you set the cursor. Alternatively, pressing the Note Chase button enables you to select the MIDI Note Number via MIDI - from a MIDI keyboard, for example.

Once a sound has been selected, it can be tuned over a range of +3/-4 semitones by pressing the Tune button and using the Data knob. It's worth mentioning that this edit is not retained with a sound, but applies to the MIDI Note Number - so if you select 'Dry Punch' for your snare sound, drop it by a semitone and then substitute 'Amb Punch', the new snare will play back a semitone low. To make auditioning sounds easier, Alesis have provided the D4 with a Preview button. This allows you to hear the currently-selected sound whenever you poke the button. Not only that, but the button is velocity sensitive, so you can get some idea of how it's going to respond to your ➤

"Where the D4 scores over certain other drum expanders, however, is through its integral trigger interface."

> programming. It's an extremely useful feature - not dissimilar to the Playback button found on Akai samplers - but I was left with the distinct impression that the review model had been set up with drummers in mind, since I was in danger of overturning my rack before I got much of a response from it. I did discover, however, that if you hold the Preview button in after hitting it, rotating the Data knob through any of its functions caused the sound to both change and be retriggered at the same time. In this way it's possible to hear a snare drum firing and changing in pitch just by turning this knob. I'm sure this isn't a feature Alesis intended the D4 to have, and I didn't actually find it at all useful but having discovered it, I'm determined to share it with someone. . .

Apart from the Ext Trigger button, there's only one other button on the D4 to deal with: the one marked Group. Here you have the option of assigning a sound to Multi, Single, Group 1 or Group 2. Multi determines that a sound should contine to play through to the end of the sample even if another MIDI Note On arrives before it's finished. This "unconditional release", as it was known in analogue days, prevents one of the early problems that

"Saving data via MIDI also allows you to dump the edit buffer, trigger setup and program table as separate files."

Having made a selection of sounds for your Drumset, you can set volume levels with respect to the other sounds in the Set by pressing Mix and setting a level somewhere in the 00 to 99 range. Also under this button you'll find the pan setting - nothing complicated, just a seven-position pan between the left and right audio outs of either the Main or Aux stereo pairs.

And on the subject of audio outs, pressing the Output button puts you in control of the sound's route to the outside world. Nothing too complicated here, either - on the top line of the LCD you select a MIDI Note Number - and hence one of the sounds in the Drumset - while on the bottom line, you're presented with a choice between the Main and Aux outs.

Once you're satisfied with your assignments you can save them by hitting the Store button. The display offers you the chance to abort the operation or, assuming you wish to continue, to name the Drumset with a 14-character name (characters are selected with the Data knob). A second prod of the Store button completes the procedure.

One last - and quite commendable - inclusion in the sound management facilities of the D4 is its ability to recall factory presets from ROM. Best of all, you don't have to recall all 21 Drumsets if you don't want

plagued digital drum machines from afflicting the D4. With Multi selected, repeated cymbal strikes, say, don't cut each other off. But while this is an important aspect of the behaviour of a real cymbal, it's quite inappropriate to the sound of a vibraslap, for example. And, strangely enough, this is where the Single setting comes into its own. The remaining Group 1 and Group 2 settings are a duplication of the same facility - that of making several sounds mutually exclusive. By assigning open, foot-closed and struck closed hi-hats to one of these Groups, each sound can be made to cut off any other, more closely approximating to the performance of the "real thing".

One of the D4's hidden features is its parameter copy function. All settings for the Voice, Tune, Mix, Output and Group can be copied to another MIDI Note Number by pressing Store while holding Note Chase. The LCD now asks for the copy destination, which is entered using the Data Knob. It's easy and it's useful, but it's certainly not intuitive.

to; instead you can select any Drumset to be written into any of the 21 Drumset locations. Again, this is a hidden function (press Store while holding Drumset) but as it's not something you're likely to do very often, who's moaning? Not me.

TRIGGER WORK

IN SOME CASES the performance of the D4's triggering facilities is going to be decisive in determining whether or not Alesis' latest drum box gets the gig. It's as well then, that there are no less than 25 different trigger types (selected via the Ext Trig button) making use of different combinations and settings of three separate trigger parameters. The manual breaks these 25 trigger types into three sections - for use with *bona fide* triggers from drum pads or drum machines, with signals from piezo transducers attached to acoustic drums, and with drum sounds recorded onto multitrack tape. The first group is subdivided into three further groups. All of

this is to help you home in on the most suitable trigger option with the least fuss.

The parameters contributing to the performance of the trigger options are Recovery time (the period after a trigger signal during which subsequent triggers are ignored), Noise Floor (the threshold below which signals are not accepted as legitimate triggers) and Suppression (a trigger's ability to check the other trigger inputs for higher-level signals in case its own signal is a consequence of another channel being triggered). None of these parameters is directly accessible to the user, but the availability and variety of trigger types - in conjunction with a user-determined Trigger Gain - is a practical compromise between flexibility and ease of operation.

One further Trigger Type is available - Unassigned. This gives you the facility to use one of the trigger inputs not as a trigger itself, but as an input to the Suppression circuit. The idea is that if you know some particular signal source is going to be causing false triggering, you can optimise the suppression parameter to discriminate against it. It's likely to find more use on stage with a drummer than in a MIDI recording suite, but it's an indication of the diligence of the D4's designers.

I was able to test all the triggering options with the exception of piezo pickups, and had no trouble in getting the D4 to perform happily with a minimum of fuss. It was one of the aspects of the unit I was anticipating being the most difficult to review, but I was wrong.

Stepping through the settings in the Ext Trig section, the last option you're presented with is called Footswitch Mode. This refers to the Footswitch jack on the D4's rear panel and allows you to configure the module to read it either as a foot control for the sound assigned to MIDI Note Number 44 (which is a hi-hat in all the factory presets, but doesn't have to be) or as a Drumset Advance, which steps through the Drumsets (upwards only) and wraps around from Set 20 to 00 - which the Data knob doesn't. One neat feature of the Footswitch circuitry is its ability to detect what type of footswitch you're using (contacts normally made or broken) and adapt itself accordingly. That's pre-empted one batch of problems.

SOUND WORK

WITH 501 SOUNDS to consider, it's impractical to give a representative account of the sonic scope of the D4 in a review. The first remark to make, then, must be that although there are large selections of sounds, the sounds themselves are well programmed and well chosen. Essentially they all appear to be *useful* sounds. Factory Drumset 02, Classic Hex, makes extensive, but not exclusive, use of Simmons-style electronic kick, snare and tom sounds. Similarly, Drumset 19, Tribal Stuff, lines up talking drums, timbales, shakers, triangles and so on. Other Drumsets come under such titles as Jazz/Fusion, Ambient Rock, Industrial and Hard & Rockin'.

If the D4 can be said to have one, its emphasis must be on "realism". And given that one of the D4's

predecessors, the HR16, is one of the most "natural sounding" machines to have hit the beatbox market in years, it's not really all that surprising. (In case you were wondering, the answer is yes - the D4 does draw on previous Alesis machines for some of its sounds but there's plenty of fresh stuff here too.) None of this is to say that fans of more artificial percussion sounds have been left out in the cold, however - as well as the electronic kit sounds mentioned above, there are TR808-style kicks in 'Rap' and 'Rumble' (Kik 80 and 81) and 808-style snares in 'Rap' (Snr 33), 'Low Rap' (Snr 34) and 'Dance!' (Snr 65). To my ear, the 808-style kicks had a little too much attack and I preferred the sound filed under Efx 76, 'Analogue', as an alternative to the real thing.

Don't be misled by the shortage of drum categories either; Snr, for example, also carries sticks and brushes as well as flanged and phased snares, while Prc and Efx cover a multitude of percussive sins. There are too many attractive sounds to start listing them, but I did find some of the snares excellent and the talking drum was a particularly welcome discovery.

VERDICT

IT'S HARD NOT to come down heavily in favour of the D4. Its sounds are powerful and varied, it's a breeze to operate and it shouldn't break the bank. You could happily make it your main drum machine - using the outputs to give you up to four concurrent, isolated outputs or by isolating, say, the kick and snare and using a stereo mix of the rest - or use it in addition to another machine.

In terms of sounds, the D4 is to the beatbox world what the Oberheim Matrix 1000 is to that of synths. You're severely restricted on programming, but there are so many sounds that you should always be able to find something to fit the bill. Perhaps the only area that's been neglected here is that of reverse sounds - the D4 ain't got any and short of sampling from it and reversing the sample, you ain't gonna get any out of it. It would also be fair to say that many of the sounds are simply edits of other sounds (not that Alesis are alone in building up beatbox libraries in this way), but the edits largely stand up in their own right and this doesn't compromise their usefulness.

Even the manual is friendly and informative, and comes with a useful sound chart (listing all 501 of the buggers complete with a table telling you whether they're sampled dry, with reverb or in stereo with reverb) and a reference chart of the factory preset Drumsets. There's also a separate sheet to help you set up the D4 triggers quicky and efficiently. The only *real* criticism I can come up with is that damned Preview button - not only is it horribly squidgy and unresponsive, but it actually made my fingers sore to use it. Perhaps it's just Alesis' way of reminding you about the origins of the sounds you're using . . . ∎

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"The trigger section was one of the aspects of the D4 I was anticipating being the most difficult to review, but I was wrong."

WIND OF CHANGE

Brass band to big band, Sade to Shoom, trumpeter Gordon Matthewman has played his horn in many musical settings. Now he's experimenting with sampling and sequencing technology. Interview by Simon Trask.

BACK IN THE EARLY '80S, A FLEDGLING musical technology called sampling was setting the cat among the musical pigeons. Some saw it as a window onto new creative vistas, others saw it as a potential threat to their livelihood. The former perceived sampling as a way of gaining their sound, the latter as a way of losing theirs.

At the same time, the notion of people programming music on synths and sequencers, rather than playing it on guitars, bass and drums, hit the pop mainstream for the first time, and many musicians hated it - or rather, they hated the fact that kids who couldn't play an instrument between them were nonetheless having hit records. Sounds familiar? Yes, it was the beginning of a polarisation of attitudes towards technology which afflicted much of the '80s, with "non musicians" - invariably making dance music - in one corner and "real musicians" in the other.

Not everyone was susceptible to such either/or thinking, however. One live performer who found himself very much at home in the world of dance music was a young trumpet player by the name of Gordon Matthewman. He made a name for himself in London's clubland during the late-'80s by playing live trumpet over the records being spun by the DJs in clubs like Delirium and Shoom. At the same time, he began gradually building up a hi-tech home studio which has come to include two rack-mount digital samplers, a number of drum machines (including the Roland classics) and what he refers to as "toy" keyboards in the form of the DX100 and CZ101.

Nowadays, working under the name Blow, Matthewman creates jazz-influenced funky instrumental dance tracks which mix live and "sampled live" trumpet, sax and guitar with sequenced keyboards, bass and drums to great effect. His fourth single, 'Cutter', was released last October on 10 Records, while a debut album, *Cutter*, which he has co-composed, programmed, engineered and mixed, has been in the can since last May, pressed up and waiting to go since last Autumn, and is now set for February release. From uptempo clubby tracks like 'Oh Yeah' and the title track, to the soulful 'Keep On' (the one vocal track on the album, featuring singer Gina Foster) to the bouncy uptempo go-go funk of 'Bridge & Tunnel' to the wonderfully mellow 'Watching The Girls. . .' (strongly influenced by the Floaters' classic 'Float On') to the firing 'Jazz '91' to the sublime 'Wish You Were Here' (I wish I was, too), it's an album which manages to be well varied and yet have a strong unifying identity. In part this comes from the distinctive, melodic compositional style of Matthewman and his brother Stuart (co-composer of six of the nine tracks on the album), in part from the brothers' distinctive trumpet and sax work which features throughout the album, and in part from the blend of live and sequenced feels which Matthewman has managed to achieve on the tracks - one of the most successful I've heard.

IN FACT, BLOW BEGAN LIFE BACK IN MID-'87 as a duo consisting of Matthewman and keyboard player Adam Routh.

"Right from the beginning we took it out live, we ➤

did gigs and everything - which was a real nuisance for him", Matthewman recalls as we sit in the offices of his record label. "I'd got my trumpet and he'd got all this equipment. I don't think many people realised that it was live. It was fun, we did it, but as far as doing it all the time, it was just too much hassle getting everything to work. At that time the technology wasn't reliable enough. For instance, if we did three songs, the sample memory wasn't there to have enough stuff, so we'd have to stop and load in more songs. With the technology now, it's easy."

Matthewman continued on his own, initially playing live trumpet over other people's records in the clubs but later progressing to playing over acetates of his own tracks which he'd give to the DJs to play. Far from being a fad, it's become an essential part of the way he works.

"I really enjoy live playing. For me that's the best thing", he says. "It's all very well being in your front room mixing something, but if you're playing in front of a crowd of people and they like it, that's a whole lot better.

"Recently I've been mixing stuff specially for live work. If you're doing something live and people are actually turning around and looking at what you're doing, the arrangement has to be more focussed for what you're doing, in order to get things across. So I'll mix a backing track during the day, and I've got a friend who'll cut an acetate, and I'll take it out the same night. That's the closest I can get to playing live without lugging all the machines out. I have thought about bringing stuff out but I'm not really convinced that it's worth it, because I'm doing something visual with the trumpet - if something visual is required - and the majority of people at a club aren't that interested in seeing little drum machines.

"Besides, part of the process for me is cutting acetates. Each time I've done a PA, I've cut an acetate, and apart from hearing my mix I can hear how well it gets cut. I learn about cutting records, what it involves, how much level you can put on an acetate - all that sort of thing. Part of the help that I had in recording the album was getting a perspective on mixing from doing acetates of some of the tracks. I've been mixing on NS10s, and you just can't hear low frequencies on them. A DJ friend of mine, Colin Faver, tried out some of the tracks on the big systems. When you hear your tracks mixed with other records and suddenly there's masses of bass or there's no bass, or there's no snare or mid-range in them, you can go back to your studio knowing that you've got to bring the mid-range up more. Stuff like that."

Matthewman has developed a much less formal approach to live playing than that required in traditional gigs. Instead of playing in front of the audience, he's just as likely to be playing *in* it.

"I've got a radio mic attached to my trumpet. I'll check out the sound with the DJ and then I'll go right in the crowd and stand next to people who are dancing", he explains. "To see people's faces when they hear a bit of trumpet on this track that they know, and they're thinking 'That's not usually there', and then they look at me playing. . . Nine times out of ten they have to stick their ear right in front of the trumpet so

> **"There's a certain feel if you use drum machines and program on them that you don't get if you program everything on the computer."**

that they can really believe I'm doing it. It works, doing that sort of thing.

"Later on, when I've done that a bit, I'll go somewhere a bit more focussed and play a bit there. After that I'll get the hell out and let them get back to dancing, 'cos they tend to stop and listen when I'm up on stage. I've tried not going up on stage at all but if the promoter of the club has asked me to come and play, they're so used to seeing somebody going on stage and doing it, that I've found it's best if I do a bit of both."

So what sort of records does Matthewman find best for playing over?

"Most of the things that have really worked, I haven't got a clue what they were", he replies. "There's a few tracks that I'll know, but I actually prefer not knowing what they are, because it's a lot more fun that way. Sometimes it just seems to click. 'Cos it's not the sort of thing you do all night.

"With the rave stuff, there's so little of it that's got chords or anything melodic or atmospheric. Whenever there's something that sounds like it's got room in it, I'll come in and play over that open space. The best tracks recently have been the ones where there's a break and the drums drop out; there's a few of those around, where they just have some atmospheric sound coming in."

So could Matthewman elaborate on his approach to playing over records? Is it the more traditional concept of soloing over something, or is it more a concept of adding something to the arrangement?

"Well, there's different ways", he replies. "Some of the best times it's worked is where you've got a track that's got, say, a two-bar rhythmic pattern to it, and you'll get a rimshot playing for the first bar and then dropping out for the second bar, and I'll play something melodic that will have the same rhythm as the rimshot. Then people can relate through the rhythm to what I'm doing. Also, if it's a good snare pattern I'll figure out the pattern and then work out a tune that fits with it, or maybe just pick out the accents in the pattern and fit a tune to them. I'll use that until I get bored with it! Then hopefully there'll be a break where I can play something a bit more flowing, so you get a contrast between the rhythmic and the melodic."

Despite his professed reluctance to use technology live on stage, Matthewman's urge to bring together his trumpet playing and his MIDI instruments could get the better of him. He's been working at home with a Roland CP40 pitch-to-MIDI Converter, and is well pleased with it.

"It actually responds pretty fast", he comments. "It's only a little thing, I think it cost about 120 quid; I couldn't believe it was so cheap. The trouble is that the spillage on the mic live sets off the tracker, so I've got to find a way of really gating it down so that it only opens up when I'm playing.

"Another problem with using it live is that, if I'm tuning to a track, it's only got a tolerance of maybe about two percent either way, so I'll probably only be able to use it on my own tracks. You can put it on complete freedom mode, where whatever pitch it is it pitchbends to it, something like that, but it slows the tracking down too much. But that's something I really

hope to try out, 'cos I think it would freak people out if they saw me playing trumpet and it sounded like a piano or a violin!"

Talking about tuning, it must be something of a problem for Matthewman in a situation where records are varispeeded on Technics SL1200s to sync the bpms or simply to bump up the tempo.

"Yeah, a lot of the time it's impossible to get the tuning right", he confirms. "With the trumpet you can tune quite a long way, but the harmonics will go out if you tune too far. It just sounds nightmarish; that's another thing that restricts when I can play. With my acetates, on the label all it's got written is '+1%', which the DJ seems to relate to. You've got about a tone difference on the 1200, so if he puts it on +8 it's like 'Oh no, I can't play it all a semitone or a tone up, it's in some awful key'."

It would make sense for Matthewman to bypass the problems of trumpet tuning and play through pitch-to-MIDI converters with something like a Yamaha WX7 or an Akai EVI MIDI wind controller. It turns out he already has a WX7.

"I did use it once live", he reveals, "but people couldn't really relate to it. It was like 'What's that liquorice stick?', whereas it seems with the trumpet they can relate to it a bit more. I did use it once for triggering loops, 'cos it's got a key hold function on it, you can play one note and then hold it. So I had a loop going on the key hold, and then played over the top of the loop. People stared at me as if I was mad!"

Did the WX7 get used much on the album?

"I think I used it for a little vibes solo or something like that, but not much", he replies.

So has he gone as far as he's going to go with it?

"I hope to use it more; it's sitting ready on input three of Unitor", he replies. "But the problem with it for me is that trumpet embouchure is quite a delicate thing, and you've really got to practise every day to keep your tone and co-ordination together. Whenever I play the WX7 it seems to affect my lip, so for a couple of days after I've played it, it affects my sound on the trumpet.

"That's the main reason I haven't really gone into practising it and using it a lot. But I should do. I started off on recorder, and the fingering's identical. Runs are a lot easier on it than they are on the trumpet - and for octave leaps, you've got seven octaves at your thumb!

"The best thing for me when I use the WX7 is the fact that you have to breathe. It makes the line that you're playing sound more natural. If you're playing on the keyboard you can just keep going and going, whereas if you're doing a trumpet or a sax solo with the WX7 you actually have to stop for breath - unless you're doing circular breathing, of course - and it makes the solo sound natural, 'cos people are so used to hearing trumpet and sax parts with gaps in them. It's pretty good for playing rhythmic parts as well, again because of the breathing thing. I really should use it more."

FOR SOMEONE WHO HAS INVOLVED HIMSELF with the very music and technology which is still anathema to a lot of traditional players, Matthewman has a very traditional musical background. He started playing the trumpet when he was ten, and as a teenager progressed to playing in brass bands and big bands in his native Hull.

"There was a different band every night of the week that you could join", he recalls. "I enjoyed the jazz big band the most. The band leader would bring in all the new arrangements - like Maynard Ferguson was one of the big band people at the time - and we played these arrangements. Or tried to."

Even brass bands contributed to his experience. . .

"I wasn't fond of going 'oom-cha oom-cha oom-cha'", Matthewman replies, "But it was really good for sight-reading and the discipline of it. But I knew that sort of thing wasn't for me."

When it comes to timing, playing in a brass band isn't so far removed from using sequencers: "In a brass band they're aiming for a perfect, tight sound. Before sequencers were thought of, if it was a good band it had a tight sound, almost like a quantised sort of thing. They're very up on the demisemiquavers and all that business - but with a feel, like you have on sequencers now, where you design your own feel and get a tightness around that feel. Music's always been striving for that."

So has Matthewman always been a professional musician?

"I've never had a 'proper' job, as my uncle would call it - 'Get yourself a proper job, lad!'", he muses. "So yeah, professionally means you get paid for it, I suppose, so ever since I left school, really."

In the early '80s he landed himself a job playing on a cruise-liner in the Caribbean for two consecutive winters - a move which was to prove very important for his future musical direction.

"I was in a place where the radio was really good: Puerto Rico", he recalls. "They'd just got into doing mixing and I'd go to clubs and watch the DJs doing edits and all that sort of thing - which nobody was doing in London at that time. Not to my knowledge, anyway. So I just started getting into it, and I'd spend all my time doing little tape edits, trying to be as good as these DJs in Puerto Rico, and the guys on the radio. They were mad for electro, 'cos the Latin-influenced electro like the Shannon stuff was massive, they loved it. All the young people had these low-ride cars with massive sound systems in them. It was crazy but I loved it!"

When someone onboard the ship suggested that Matthewman should try playing his trumpet over the mixes he'd been editing together, he laughed - but the germ of an idea had been sown in his mind.

Through his brother Stuart, who played sax and guitar in the group Sade, he got the call to play trumpet on their debut album *Diamond Life* ('84). The following year he became part of the horn section for the group's first UK and world tour. It was during this time that he began to get interested in recording his own music. Subsequently he started working on some tracks ("but very vaguely"). It was a visit to the legendary Paradise Garage club in New York in early '87 which clarified his musical direction for him.

"I know the Garage is known for its soulful vocals", he says, "but the night I went it was all the electronic ➤

"In a brass band they're aiming for a perfect, tight sound. . . if it was a good band it had a tight sound, almost like a quantised sort of thing."

stuff, hardly any vocals - it must have been B-sides of house tracks. It all sounded so different to me. But it just made me think 'I'm doing the right thing here, this is sounding like what I was hearing before I heard it!'"

Sort of a justification, then. Later in the year Blow started up, and we're back to where we picked it up.

MATTHEWMAN'S FIRST HI-TECH PURCHASE was a Korg SDD2000 sampling digital delay, which he still uses today ("It's really noisy, but it's got character to it"). The SDD2000 was followed by a Roland S330 sampler and a Yamaha DX100 synth.

"The DX100 was my master keyboard", he recalls wth amusement. "But 'cos its keyboard wasn't velocity sensitive, if I wanted any velocity values other than 64 in a sequence I had to write them to individual notes in the sequencer. People thought it was very funny when I turned up at a studio with this little keyboard under my arm.

"I think the next thing I got was a CZ101. It was all toy keyboards at first, until I got the majestic M1R. My studio's been built up gradually. I've done a gig playing trumpet, and with the money I've got from doing that I've gone out and bought another bit of gear."

Nowadays his main keyboard is a Yamaha DX11.

"It's not particularly happening", he admits. "If a really good keyboard player saw it he'd probably say 'See ya, mate' and walk out! But I quite like it, actually, although it's a bit noisy. For bass sounds I usually mix the DX11 and the S330 together, 'cos whereas the 330's like a punchy bass you get the ringing or the sustaining warmth of the bass from the DX11."

Far from lying around forgotten in this age of Notators and S1000s, Matthewman's collection of drum machines old and (relatively) new sees regular use. For him, it's the feel factor which makes the original machines unique.

"There's a certain feel if you use drum machines and program on them that you don't get if you program everything on the computer", he opines. "What I do quite a lot of the time is sync up the drum machines to the computer and then program on the individual machines; that way they'll be doing their own thing and also making life easier for the computer. The only drum machine I'll sequence from Notator is the HR16B, because it's so tight over MIDI."

Along with the HR16B ("very good for top-end things like cabasas and hi-hats") and an Oberheim DX, Matthewman's collection of drum machines includes a strong complement of Rolands: TR808 (Groove MIDI-retrofitted), 909, 707, 727 and R8.

"I had to get the full Roland set", he insists with a grin. "There's an appeal to doing it. A lot of people just have to have them all."

But for Matthewman there's more to wanting the original machines than a severe case of technolust.

"Anybody can get TR909 samples now, but the *feel* of the 909, the groove that's on it, you can only get that by programming the actual drum machine", he insists. "The same with the 808 - it's got an atmosphere and a groove all its own. I'd say it's worth spending the money to get the original machines.

"If you really zero in on what the drum machines

do, the 707 seems to push the beat and make it bright and poppy somehow, while the 909 makes it dirty. I think the 909 as it clocks to MIDI sync is slightly late, and the 707's slightly ahead of the beat, and the 808 is slightly ahead but it's got certain drums that are behind, which makes it even weirder. It's all very subtle, but each machine's got its own character. There's different sounds on each drum machine that really complement each other, so, if you pick the right sounds on all the drum machines, they really make sense when you use them together."

Matthewman professes that he'd like to achieve a kind of fluidity in the feel of the music which he finds hard to get with the click track of the sequencer controlling everything.

"Some of the tracks I like best - like Marvin Gaye tracks - you get this great groove happening, but it kind of moves around the tempo, though in a really natural way, and everyone follows that fluctuation", he points out. "It's not a wrong thing, it's just part of the feel, to be able to build it up again, that sort of thing - which you lose if you play to a click track."

The album tracks are, as mentioned earlier, a combination of live parts played to multitrack tape (trumpet, saxophone and guitar) and sequenced parts (drum machines, synths and sample loops). That the two are smoothly blended rather than set off against one another is partly because Matthewman has sampled off the multitrack in order to give some of the live playing an insistent looped feel.

"My brother would have one track of guitar fills but he'd also do a rhythm track. Going through it I'd find parts that sounded really tight and funky, sample those and then bring them up as a loop", he recalls. "Then it's a lot easier arrangement-wise. I'll take two or three similar guitar samples and once you think it's a loop I'll feed in another sample that's similar, it just sounds like it's playing slightly differently. I've done that quite a lot."

With the album taking so long to come out, Matthewman's experiments with his acetates have been, as he puts it, keeping him sane. But is there a danger that he'll find himself wanting to rework the album before it even comes out?

"I really want the album to be as it is for a time without remixing things too much", Matthewman states. "But while I was in New York recently there was a DJ there who had got hold of a copy of the album, and he was playing 'Jazz '91' in amongst all these hip hop tracks, and it worked, it sounded fine and it kept the floor. So I've got ideas for remixing that, just from hearing it that time. It really makes a difference hearing it in a club, 'cos then you know what it needs."

Finally, being so into live playing, has he considered going out with a live band once the album's out?

"If people are buying the record and they really like certain tracks, then it warrants going out with a band, otherwise it's kind of a false move", comes the reply. "But yeah, that would be so good. That's what it's all about - playing with other musicians, the dynamics that you get from musicians reacting to one another. I think songs come to life when you get people interpreting the basics that are there on the album. Playing live just inspires you a lot more." ∎

EQUIPMENT LIST

RECORDING
Alesis Quadraverb Multi Effects Processor
ART EXT Multi Effects Processor
Atari 1040ST Computer
BSS Compressor
C-Lab Notator Sequencing Software
C-Lab Unitor SMPTE Sync Box
Korg SDD2000 Digital Delay
Soundcraft 200B Mixing Desk
Tascam TSR8 Eight-track Tape Machine
Yamaha NS10M Monitors

INSTRUMENTS
Akai S1000 Sampler w/18Mb RAM
Alesis HR16B Drum Machine
Casio CZ101 Synth
Korg M1R Expander
Oberheim DX Drum Machine
Oberheim Matrix 1000 Expander
Roland CP40 Pitch-to-MIDI Converter
Roland R8 Human Rhythm Composer
Roland TR707 Drum Machine
Roland TR727 Drum Machine
Roland TR808 Drum Machine w/Groove MIDI retrofit
Roland TR909 Drum Machine
Roland S330 Sampler
Yamaha DX100 Synth
Yamaha DX11 Synth
Yamaha WX7 MIDI Wind Controller

RHAPSODY II

Although it has the credentials of an excellent music computer, the Archimedes is suffering from lack of software support. Can Clare's notation and voicing programs turn the tide? Review by Ian Waugh.

ACORN SPENT SEVERAL years and not an inconsiderable amount of cash promoting the Archimedes computer as a music machine. But music programs for the Archies have been rather thin on the ground and even Pandora's !Inspiration (reviewed MT August '91) which took almost three years to write isn't all it could or should be.

The shame of it is that the Archimedes, particularly the new A5000, is an excellent piece of equipment, well suited to music - and virtually all other computer applications. However in the commercial world, software developers like some assurance that anything they develop will sell. Unfortunately, the Archimedes is running so far behind the Atari ST, Commodore Amiga and PC (and possibly the

Spectrum and Commodore 64) that most developers (apart from the ubiquitous EMR) consider it a non-starter.

But about a year ago, Clares lauched Rhapsody. This was followed a few months ago by Rhapsody II and, more recently, by two utility/accessory programs. All at budget prices, too. Music on the Archie could be looking up.

PROGRAM OF NOTE

RHAPSODY ISN'T A sequencer in the normally-accepted sense of the word. Rather, it describes itself as a music notation program. Notes are entered on the stave in traditional music notation using the mouse, although you can record from a MIDI keyboard. You can print out the score and play the

piece using the Archie's built-in sounds or via MIDI.

Rhapsody (review v1.23) will run on with 1Meg of RAM and runs under RISC-OS. It's not copy protected (high marks to Clares) and can easily be installed on a hard disk. If you want to use it with MIDI instruments, you'll need a MIDI interface - Acorn's interface costs around £75.

A single score can hold 24 staves and up to five scores can be held in memory, which allows you to transfer parts from one score to another. The staves can be joined in piano or orchestral format and each stave supports two voices, which should suffice for virtually all popular music and most classical music.

PANEL BEATING

MOST OPTIONS ARE accessed from a main menu which is called up in normal Archie fashion by clicking the middle (menu) mouse button over the score. One option is to Show Panels. These two Panels are the hub of the program's operation.

Panel 1 contains notes and symbols which are selected by clicking on icons to cycle through the symbols until the one you want appears. There are icons for notes, rests, accidentals, duration modifiers (dots, ties and triplets), bar lines, accents and ornaments (more about these in a mo) and text and miscellaneous functions.

Rhapsody I employed a rectangular cursor for placing notes and symbols on the stave. This moves under control of the mouse or the icons in Panel 2. Having positioned it, you enter a note by clicking on "left of", "right of" or "on cursor" icons in Panel 1. It's not quite as awkward as it sounds but it can be rather time-consuming. Note durations and symbols can be selected with function keys (a function key overlay is supplied). Rhapsody II also lets you drag notes onto the stave, which is far quicker. This is one of II's major updates which will be welcomed by Rhapsody I users. However, if all the symbols were on show for selection with one mouse click, it would be faster still.

One of my major disappointments is that the program doesn't align notes across the staves. It has a fair old bash at it but it's quite possible to insert, say, several quarter notes on one stave in the same "space" as one half note on another. Bar lines have to be inserted manually, too. This is exactly the sort of area in which music software could and should help.

COMPOSE YOURSELF

STAVES CAN BE added to the score as you go, although if you're well organised you can lay them out and set them up before you begin. Each stave has a number of attributes which are set up from an Assign Stave Data menu. These include a MIDI channel to transmit on, a MIDI Program Change number, a transpose interval and internal Archie sound, stereo position and volume. The staves can be named (ten characters) and the spacing between them adjusted.

You can also assign a number of sound channels to the stave. This is for use with the Archie's voices

as it can only simultaneously play eight. There's no such problem via MIDI, of course.

Rhapsody II supports multiple MIDI Outs - if your MIDI interface has them - and you can insert a program change at any point in the music. It's worth noting that it doesn't support MIDI bank change messages (which have been around now for well over a year) which many new synths and expanders use. There's also a MIDI Thru function, which is useful if you're using a synth and expander.

Music can be entered from a MIDI keyboard using real-time Capture mode. Truth to tell, it's not particularly sophisticated (the manual admits as much) and if you're over-ambitious you may lose notes. It helps if you record slowly, too.

Rhapsody II can transmit the metronome tick via MIDI, and the Transcribe window, which converts your recording into notation, has triplet quantise settings. You can also record in step time, selecting note durations from the Panel or with the function keys. Triplets and chords are supported although velocity data is not recorded. While not being particularly sophisticated, these do offer alternative methods of putting notes into the program.

Volume changes can be inserted (using *pp* and *ff* marks), as can tempo changes, including programmable accelerandos and ritardandos, although these are shown numerically rather than graphically as hairpin signs.

Editing functions include the use of markers to copy, clear, delete and transpose sections of the score. You can swap the direction of note stems, make and break beams and adjust the spacing between notes. Sections of music can be merged, too.

Most operations can be performed while the music is playing, although sometimes operation may be a little slow. It's interesting to know that the program was developed using Silicon Vision's RiscBASIC.

ORNAMENTS

ONE NOVEL FEATURE of Rhapsody is the ability to create your own ornaments. You'll find these under the Trill Definitions menu called from the Accents icon in Panel 1. There are six definable ornaments (the symbols are selected and placed from the Accents icon), each with four stages of "development". These include the starting note, the "shake" below the main note and the trill itself followed by the "turn". You can also set the speed of the trill. Fascinating stuff - although of more relevance to classical music than pop or rock. These ornaments play via MIDI, too, which is reminiscent of pseudo (MIDI) events found in more upmarket programs (principally on the ST).

While not wishing to detract from an excellent idea, the scope of the definitions won't allow you to construct all classical ornaments, which may vary in interpretation depending on the tempo of the music and their position in relation to other notes. And if it's classical scores you're interested in, it's worth noting that Rhapsody can't produce phrase marks, which are an essential part of most classical music. However, ScoreDraw can (coming up).

"Most operations can be performed while the music is playing, although sometimes operation may be a little slow."

> You can also define the length of staccato and marcato symbols and these, too, will be interpreted over MIDI.

You can insert text anywhere in the score, although only 13 characters at a time. Text isn't tied to any notes so for lyric entry you have to do the positioning yourself. Not ideal.

PRINTING

ONE OF RHAPSODY'S main purposes in life is to print scores (Cambridge United 4 Liverpool 0). This requires a printer driver which is compatible with your printer. First stop will be the drivers supplied with your Archimedes (on the Applications disk) although the program should work with any driver.

Score format settings in Rhapsody II are stored as part of the file. You can set margins and alter the spacing between the staves, there are seven sizes of print and you can select portrait or landscape orientations. Before printing, the score appears in preview mode where you can add or insert bars to adjust the layout.

The only problem I discovered was that the program doesn't like to play music while you're messing about with its formatting (would you?), and it quit on me (wouldn't you?).

Rhapsody II's printout window gives more information than Rhapsody I and offers multiple copies. The sprites have been redefined using Mode 19 for higher printout resolution, although they are still bitmapped images. Another problem is the misplacement of some symbols. Beams may overlap the stems they join and some ornaments overlap the stems instead of sitting above them.

Printing takes time: lots of it. The program's not clever enough to recognise blank lines and each line

takes the same amount of time to print whether there's anything there to print or not. For example, one page on an Epson FX printer using a hi-res printer driver took 18 minutes. Multiply this by a score with ten or more pages and we're talking an afternoon printing. Time to get drunk and sober up, too.

Also, printing takes over the computer so you can't print and work on another score at the same time. I've yet to investigate use with a printer buffer.

FILE COMPATIBILITY

ARCHIE USERS WILL have realised that Rhapsody has certain similarities with Maestro, the music application which comes free with RISC-OS, even though Rhapsody is more powerful. However, the programmer has maintained file compatibility so you can load Maestro files into Rhapsody, making it an ideal upgrade if you want more power and flexibility.

Rhapsody also supports MIDI File format, which will stand it in good stead for compatibility with existing and future music programs.

The disk includes 20 demo files; there are excellent examples of Rhapsody at work, although I hesitate to think how long some of them took to construct. Well, scorewriting can be a pretty time-consuming business. They include 'Apres Une Reve' by Faure, 'Vocalise' by Rachmaninoff, Debussy's 'Golliwog's Cakewalk', Scott Joplin's 'The Entertainer', 'Fame' and several pieces by Bach and Grieg.

RHAPSODY UTILITIES

SCOREDRAW IS A separate program designed to improve Rhapsody's printing. It converts the score into Draw images, giving greater control over the layout and improving the print resolution enormously. It interfaces with Rhapsody beautifully. Instead of accessing the normal Format menu you access the ScoreDraw menu which formats the score in Draw format.

It has several additional options which let you change margins, page size, scale and orientation. There's a zoom facility and you can decide whether the title and stave names are printed on each page or just the first one. You can select fonts for text, the title and dynamic markings. One oddity: some of the lines in the staves appear double width on screen. Peculiar, although they print correctly.

You can save the entire score or just the current page and load it into Draw. This isn't completely automatic, although the manual suggests which scales and grid sizes to use to facilitate editing. Also, some scores saved from ScoreDraw wouldn't load into Draw. Again, most peculiar.

In Draw, you can edit the notes and symbols, add phrase marks and so on. The positioning of some symbols is improved and the beams appear correctly but you'll still have to do some manual editing. Several music symbols, such as hairpins and phrase marks, are supplied in Draw format so you can drag them into your score and place them.

Screen redraws are slow (as they can be in Draw),

as is printing. However, the quality of the output is superb.

Voxbox is another Rhapsody utility which actually consists of four programs - VoxBeat, VoxSample, VoxSynth and Perform.

The Vox programs are concerned with sample creation and organisation and share many features. For example, you can play them from the Archie's keyboard or via MIDI, even during editing. Over 40 samples are provided and the programs can handle the three most common Archimedes sample formats.

VoxBeat was designed to create samples for a drum kit. You can assign different samples to each note in an octave, although you can only play back one at a time. You can use up to seven VoxBeat modules at the same time, too. You can edit samples in the VoxBeat window and a useful Fade Out function lets a truncated sample play out naturally.

VoxSample creates samples based on the Sample + Synthesis principle although in this case both sections are samples. Basically, it uses the attack portion of a sample for the initial transient (this has the most effect on our perception of the sound) and then you select a section for looping.

The theory is that you shouldn't need a sample more than half a second long. In practice, a little trial and error is required to find a good looping point (the computer should help here but doesn't).

You can shape the sample with pitch and amplitude envelopes. The envelopes only have two stages but each stage can have six nodes which can be adjusted by clicking and dragging.

VoxSynth is the most complex of the programs but also the most fascinating. You can create waveforms by drawing them by hand and specifying the amplitudes of their harmonics. Drawing by hand is of limited use as many older programs of a similar ilk have proven, but the ability to create waveforms from harmonics (additive synthesis) is both practical and educational.

A single voice can be made up from two waveforms and you can use an "inbetweening" process to transform one into the other over a specified time period. Fascinating stuff indeed. I'd have liked to have seen both waveforms side by side; as it is you have to toggle between them. A real-time display of the waveform during interpolation would have been useful, but perhaps that's asking too much.

Additional parameters facilitate modulation of one waveform by another - a primitive form of FM but interesting. You can drag a sample into VoxSynth and it will analyse it and display its harmonic structure.

Apart from its educational value (I can see this being very popular in the classroom), an eight-voice VoxSynth module is only 5K in size.

Perform is a stand-alone program which will play Rhapsody and MIDI files and samples. To insert a file into the running order you simply drag it into one of the 12 slots. The program doesn't load the actual files (which means the performance file you save is quite short), rather it remembers the pathnames.

It can load other Performance files so one can call another and it will *Run other files so you can load a particular set of sound modules before loading a music file. It also has a small tape transport control window which lets you move through the performance list.

VERDICT

RHAPSODY I HIT the streets at £49.95, which was a veritable bargain. The price hike to Rhapsody II still makes it an excellent buy, although it would have been commendable had existing users been rewarded for their loyalty by being allowed to upgrade for the price difference. Existing Rhapsody owners should return their program disk only with the upgrade fee. Rhapsody II simply consists of a disk and a 20-page Addendum. New users, therefore, have two manuals to contend with.

Rhapsody originally made much of its notation and score-printing facilities and some may be disappointed when they realise they have to fork out as much again for ScoreDraw in order to produce quality scores - and then you still have to adjust symbols and contend with the odd quirk. The total price for quality printouts is not quite budget.

However, for those who need it, ScoreDraw will certainly produce quality output. For those who don't, Rhapsody scores are reasonable. The Draw file format is the standard for line art graphics on the Archimedes and scores can be imported into DTP programs. Who'll be first to produce their own music book?

If you use Rhapsody with the Archie's internal sounds rather than MIDI and enjoy messing around with samples, then VoxBox is for you. The programs could have been a touch more friendly and some worked examples would have helped newcomers get into the programs more quickly, but they are essentially straightforward.

It's a shame there isn't a public domain run-time version of Perform so you could pass your music onto other Archie-owners. Perhaps it will come, or perhaps some enterprising programmer will write a similar utility.

There's no getting around the fact that even at its new price, Rhapsody is a cheap notation program for *any* computer. The discerning user, however, will notice that Rhapsody lacks the bells and whistles of more dedicated scorewriters.

While it may not quite cut the mustard for professional users, if you like working with the dots, fancy something more powerful than Maestro or want a budget program with MIDI capabilities, then Rhapsody fits the bill. I can see it having great appeal in education, where Archies are beginning to take over from the BBC micro.

If you're already using Rhapsody then I can certainly recommend the upgrade. If you want something more sophisticated than Maestro, then Rhapsody is the only thing between it and a full-blown MIDI system. ∎

"There's no getting around the fact that even at its new price, Rhapsody is a cheap notation program for any computer."

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KEYBOARDS

ANALOGUE CLEAROUT: ARP, EMS, Moog, Oberheim, Prophets. Bob, Tel: (0726) 67836/65404.

CASIO CZ101 and editor, £100. Kevin, Tel: 071-381 0046.

CASIO CZ101 synth, £100; Casio MH100 MIDI horn, £35; Steinberg Pro12 sequencer s/w, £30. Paul, Tel: (0609) 770090.

CASIO CZ5000, boxed, with manual, home use only, many extra sounds, sound cartridge, Cheetah cassette sound transfer, £300. Neil, Tel: (0937) 530414.

CASIO HZ600 home synth, not brilliant, but I wouldn't mind £100 for it. Mark, Tel: (0964) 622638, after 5.30pm weekdays.

CHEETAH 7P, 88-note weighted master keybd, boxed, as new, £400 ono. Tel: (0892) 517923.

CHEETAH MK7VA mother keybd, £200; Yamaha EMT10 expander, £150. Tel: Eggham (0784) 439834.

CHEETAH MS6 multitimbral analogue module, £190; Roland SH101, £100. Tel: 021-358 7612.

ELKA MK55 MIDI master keybd, touch sens, aftertouch, synth weighted action, programmable, ROM cartridge, easy to use, home use only (can be used for live performance), cost over £600 new, accept £325, no offers. Tel: 071-511 1120, 24 hrs answerphone.

ELKA X50 drawbar organ, like the cult CX5 but better, amazing Hammond sounds, exc rotary and distortion, very trendy, £550. Andy, Tel: (0932) 245298.

ENSONIQ ESQ1, multitimbral analogue/digital matrix modulation synth and sequencer, mega RAM cartridge, lots of great sounds, foot pedal, a mere £450. Dan, Tel: 081-958 7012.

ENSONIQ ESQ1, mint cond, £450

ono. Robert, Tel: 061-368 8969.

ENSONIQ ESQ1, expanded 10,000-note sequencer, EPROM cartridge, hard case, £495 ono; Yamaha PSS790 portable keybd, doubles as exc MIDI voice/drum expander, £145. Ideal combination, but must sell. Tel: East Sussex (0424) 218711.

ENSONIQ ESQ1, manuals, expanded sequencer, exc cond, 3 oscillators per voice, bargain at £400 or swap for Roland TR909 plus £60. Tel: 061-303 1005, eves.

ENSONIQ SQ80, boxed, mint cond, with s/w, £700 ono. Ian, Tel: (0253) 826255.

ENSONIQ SQ80 synth/sequencer, £650; Casio FZ1 sampler, £750; AHB 8-channel mixing desk, £175. Jullan, Tel: (0795) 874836.

ENSONIQ VFX-SD, 3 wks old, immac, boxed, manuals, disks, everything, not wanted, £1100 ono. Marsha, Tel: 071-839 7000 X336, days; 081-303 0965, eves.

EVOLUTION EVS1 synth module, with Atari editor, £160; Roland TR626 drum m/c, £140 or swap both for PA system. Tel: (0420) 82317.

EXCHANGE MY CASIO CZ3000 full-size synth and case for Roland Juno 1 or sell for £225. Des, Tel: Colchester (0206) 34541.

FENDER RHODES electric piano, great sound and touch, perfect cond, only £199. Tel: (0444) 247810.

GODWIN CD200 portable organ for sale, 2 keybds, bass pedals, 2 internal 50W stereo spks, as new, genuine reason for sale, £550 ono. Tel: Great Yarmouth (0493) 604514.

HOME STUDIO CLEAROUT: Roland D50, 6 mths old, £520; Yamaha QX7, £90; Roland TR626, £160;

Yamaha TX81Z, £150. All boxed, with manuals, as new. Mike, Tel: (0702) 711269.

KAWAI K1, immac, home use only, boxed, with manuals, £300 ono. Tel: (0992) 892317.

KAWAI K1R, £195; FB01, £120. Both exc cond. Tel: (0562) 67666.

KAWAI K1R, with 2 cards, plus Roland PC100 controller keybd, both exc cond, with boxes, manuals and leads, £275. Paul, Tel: (0256) 475406.

KAWAI K4, 8-part multitimbral synth, plus EMC K4 editor, plus loads of extra sounds, inc Sound Source, £420 ono. Ricky, Tel: (0475) 30181, eves.

KAWAI K4R synth, £250; Korg P3 piano module, with orchestra pit card, £175; Simmons SDE sound module, £75; Shadow SH075 guitar-to-MIDI pickup, £150. All new, boxed, with manuals. Colin, Tel: 081-878 0512.

KORG 707, 8-voice, multitimbral FM MIDI synth, £350; Yamaha TX81Z synth module, £200. Robert, Tel: 081-541 1050.

KORG M1, with £200-worth of ROM cards, £800. Tel: (0865) 246194.**KORG M1**, boxed, immac, £950; Ensoniq EPS sampler and disks, £950. Both 1 yr old, manuals etc, home use only, brilliant instruments. Ian, Tel: Coventry (0203) 395918.

KORG M1, boxed, £850; Yamaha V50, boxed, £700; Yamaha MT3X 4-track, £350; Alesis Quadraverb Plus fx, £325; Kawai MAV8 patchbay, £70; Korg EX800 synth expander, £70. Gary, Tel: (0602) 608731, leave message.

KORG M1, plus 2 Valhala Gold cards, 6 mnths old, £750. Debbie, Tel: York (0904) 635452.

KORG POLY800 analogue MIDI

synth, good working order, manual, psu, £95. Dan, Tel: Sheffield (0742) 721741.

KORG T3, 1 yr old, with full semi-f/case, original T3 disks, also disk with all the M1 original sounds, £1300 the lot. Andy, Tel: (0932) 245298.

KORG T3 workstation, exc cond, over 1000 sounds, Valhala Gold disks and cards V101 and 102, manuals, home use only, £1600 ono. Lloyd, Tel: 081-290 1782, eves.

KORG T3 workstation, exc cond, 1000s new sounds, £1350 ono. Steve, Tel: (0429) 222517.

KORG T3, full f/case, plus stand, £1250. Nick, Tel: (0364) 42633.

KORG WAVESTATION, 2 RAM cards, perfect cond. Adam, Tel: Telford (0952) 812034.

KORG WAVESTATION, £850 ono. Phil, Tel: 081-809 0630, anytime.

MOOG POLYMOOG, unworking, any offers pls. Tel: (0424) 220053.

MULTIMOOG, 2 infinitely variable oscillators, sub oscillator, self-resonating filter, aftertouch sensitive, a classic, offers. Chris, Tel: (0273) 675298, eves.

OBERHEIM MATRIX 1000 sound module, exc analogue sounds, with 100s of extra sounds, mint cond, £300 ono. John, Tel: (0253) 873716.

OLDIES: Roland MKS80, £1149; Jupiter 8, £499; Korg EX8000, £299; Hammond C3, £999. Tel: (0782) 720060.

RHODES MK80 and new f/case, offers around £1100; Alesis MMT8 sequencer, £95. Ian, Tel: 071-237 1737.

ROLAND A80 mother keybd, home use only, immac, f/cased, £995 or will p/x for Roland A50 and £300 cash. Andy, Tel: 051-336 6657,

eves.

ROLAND D5 synth, home use only, exc cond, £375 ono; Casio CZ101, £100 ono. Delvin, Tel: 071-635 8146.

ROLAND D5, touch sensitive, pro synth, £335 ono. Jonathan, Tel: (0425) 73261.

ROLAND D5, £350. Tel: Warwick (0926) 494748.

ROLAND D5, exc cond, £325 ono. Matthew, Tel: 051-625 9594, eves.

ROLAND D10, boxed, manuals, hard case, plus editor and 100s of sounds, £475. Glenn, Tel: Fareham (0329) 663238.

ROLAND D110, as new, boxed, £280. Tel: North West 051-426 5495.

ROLAND D110 synth module, exc cond, boxed, as new, £220 ono. Graham, Tel: (0962) 882109.

ROLAND D110 synth expander, exc cond, boxed, with manuals, 1000s of extra sounds, £250. John, Tel: (0253) 873716.

ROLAND D110, Yamaha TX81Z, Roland S10, Boss BX16 mixer, Atari 1040ST plus Pro24 v3, Alesis Microverb, Boss phaser, A-frame stand, cables, boxes and many extra sounds, £1800. Jim, Tel: (0283) 33458, after 5pm.

ROLAND D110 multitimbral sound module, boxed, with manuals, mint cond, £275. Don, Tel: 031-441 3948, after 6pm.

ROLAND D110 LA rack synth, inc Dr T's editor, £300. Loz, Tel: (0359) 31800.

ROLAND D20 workstation, home use only, £600. Alan, Tel: 091-263 5135.**ROLAND D50**, plus 7 ROMs, £600; E-mu Proteus XR, £599. Both exc cond. Tel: (0772) 740381.

ROLAND D70, comes boxed, with f/case, manuals, mint, 6 mnths old, still guaranteed, £1275. Don, Tel: 031-441 3948, after 6pm.

ROLAND JUNO 6 synth, vgc, £140; Roland MKS100 module sampler, plus disks, vgc, £260; SDS7 brain, with selector pad, f/case and memory cartridge, £140. Paul, Tel: (0342) 323094.

ROLAND JUNO 6, £150; Casio CZ101, with psu, £110. Both boxed, vgc, with manuals etc. Mark, Tel: (0772) 792280.

ROLAND JUNO 60, great sounds. Duncan, Tel: 021-444 2681.

ROLAND JUNO 60, has been MIDI'd, with hard case and JSQ60, £270. Richard, Tel: (0869) 249995.

ROLAND JUNO 106 polysynth, £300 or will swap for Casio VZ1. John, Tel: 061-370 2701.

ROLAND JUPITER 6, £425; Roland Juno 60, £220; Korg Poly800, £110; Roland TR626, £125; Moog Rogue, open to offers; 2-tier keybd stand, £20. Barry, Tel: (0773) 745275.

ROLAND JX10 analogue mega synth, 76-key velocity/aftertouch keybd, good MIDI spec, flexible outputs, boxed, manuals, as new, £750. Nigel, Tel: 071-324 6788, days, (0245) 421003, eves.

ROLAND MKS7, super quartet, Juno 2 and TR707 in rack, Roland's first multitimbral expander, boxed, manual, as new, £190 ono. Geoff, Tel: (0352) 755926.

ROLAND MKS70, boxed, £500 ono. Brad, Tel: (0602) 873896.

ROLAND MKS70, boxed, 3 ROMs, £350; Akai MX73 MIDI master keybd, £150. Tel: (0524) 241505.

ROLAND MT32, multitimbral sound module, 128 sounds, plus drum section, exc cond, boxed, with manuals, £200. Tel: (0740) 22433.

ROLAND MT32 synth module, exc cond, boxed, £200. Howard, Tel: (0235) 73975.

ROLAND MT100, multitimbral sound module and sequencer, boxed, with manuals, application books and disks, £400. Paul, Tel: (0536) 761014.

ROLAND PG10 programmer, as new, in box, £95. Tel: Romford 733090.

ROLAND SH09, (SH101 without arpeggiator), £50. Matt, Tel: (0395) 272343.

ROLAND SH101 analogue synth, £95; Casio SK1, £10; Maplin EC444 echo chamber, £25. Alan, Tel: Hitchin (0462) 733170, eves.

ROLAND SH101, good cond, £60. Chris, Tel: (0342) 810162.

ROLAND SYSTEM 100 keybd 101, £120; MC202, £90; limited edition SH101, £120; Kitten analogue synth, £60; CZ1000, with RAM cartridge and sequencer, £110. Chris, Tel: (0243) 586395.

ROLAND U20, multitimbral keybd, velocity and aftertouch sensitive, immac, home use only, f/cased, with manuals, £700 ono or p/x against Korg Wavestation. Neil, Tel: (0937) 530414.

SEQUENTIAL PROPHET 600, plus f/case and MIDI, just serviced, immac, £299. Tel: (0453) 825837.

SEQUENTIAL PROPHET VS synth, with rare s/w update, vvgc, only used at home, boxed, with manuals, ultimate analogue synth, £1300. A Prentice, Tel: 031-440 1774, 8.30am-4.30pm office hrs.

SEQUENTIAL PROPHET VS, plus RAM and ROM, £1050/exchange for Kurzwell K1000; Korg P3, £150; Kawai K5, £420; Akai MPC60, £1350; Orla Stage 76, £400. Tel: 071-733 0204.

TECHNICS AX7 portable keybd, 128 sounds, editing, 32 rhythms, 5-trk sequencer, touch-sens, multitimbral, MIDI, own spks, £800. Tel: Bedford (0234) 349270.

360 SYSTEMS PRO MIDI BASE + extra chips, £175. Tel: 081-674 2418.

WURLITZER ELECTRIC PIANO, case, good cond, £185 ono. Tim, Tel: (0707) 872886.

YAMAHA DX7I synth, 1000s sounds on Atari disk, £450 ono. Tel: Nottingham (0602) 504052.

YAMAHA DX11, £200; Boss BX16 mixer, £275; Roland MKS70 rack, programmer and RAM cartridges, £550, no offers. All mint cond. Brian, Tel: (0752) 674815.

YAMAHA DX21 synth, f/case, leads, pedals, good cond, £225. Joseph, Tel: (0582) 415549.

YAMAHA DX27 synth, psu, breath controller, 800 exc data cassette sounds, manuals, £200. Pete, Tel: 061-428 3022.

YAMAHA DX100, original box, manuals, home use only, £95. Tel: Warrington (0925) 224522.

YAMAHA EMT10, great sampled sounds, piano, strings etc, immac, £110; Casio HT3000 keybd, with MIDI, £100. Tel: (0869) 243049.

YAMAHA KX88, boxed, immac, £950. Chris, Tel: Hitchin (0462) 712056.

YAMAHA QY10 music station, perfect order, 1 mth old, leads, power amp etc, £200 ono. Steve, Tel: (0252) 879998, after 6.30pm.

YAMAHA SY22, immac, boxed, manual, offers around £500. Simon, Tel: (0603) 627424.

YAMAHA TG33 multitimbral expander, drums and fx, new, boxed, manuals, £365. Tel: 081-977 9531, days.

YAMAHA V50 synth, 1000+ sounds on disk, £750 ono; Yamaha EMT10 piano module, psu, boxed, £150 ono. Both home use only. Azmi, Tel: 071-373 4092, eves.

S A M P L I N G

AKAI ASK90, 8 input audio MIDI conversion board for S900 sampler, drum sounds, floppy disk, £20; ASK70, £10. Richard, Tel: Wakefield (0924) 863079.

AKAI S612, plus MD280, disks, 3

mnths guarantee, £300 ono/swap for D110 or 2 EMT10 modules; Marantz CD330 portable stereo cassette, £75. Louis, Tel: Oxford 512141.

AKAI S900, library available, £550; Fostex Model 20 1/4", with centre track time code, £275; Yamaha SPX90II, £275; Roland D110, £250; MXR drum computer, offers. David, Tel: 031-667 1675.

AKAI S950, small library, mint cond, £825. Tel: 061-483 8551.

AKAI S1000, as new, £1879; Yamaha TX16W, with library, £549; Korg S3 drum m/c, £469; Korg MDF1 data filer, £119. Tel: (0782) 720060.

AKAI S1000 kbd, touch sens, library, £2000. Loz, Tel: (0359) 31800.

CASIO FZ1, £570; Korg SQD1, £140; Korg Poly61, £250. All home use only. Andy, Tel: 081-883 4871.

CASIO FZ1, 16-bit sampling kbd, mint, boxed, disks, manual, £620. Tel: (0703) 220152.

CHEETAH SX16, 16-bit stereo sampler, 2Meg upgrade, CRT board, joystick for visual sample editing, reads S1000 disks, boxed, manuals, £800 ono. Adrian, Tel: 081-809 0684.

E-MU EMAX hard disk sampler, plus 120 disks and f/case, exc cond, £1099. Tel: (0772) 740381.

EMULATOR II+ HD, ex-Simple Minds, large sound library, manuals, exc cond, £2000. No time wasters. Don, Tel: 031-441 3948, after 6pm.

ENSONIQ EPS 4x memory expansion board, £200; with SCSI module, £250. Terry, Tel: 071-703 7133.

ROLAND S10 sampling keybd, over 100 disks, used by DJ only, £350 ono. Tel: Skegness (0754) 765871.

ROLAND S10 sampling kbd, 200 disks, inc TR909, f/case and manual, £350; Alesis MMT8 8-tr seq, £125; Mission 700 monitor spks, £60. £500 the lot. Mark, Tel: (0787) 247903.

ROLAND S10 sampling kbd, 50+ disks, Roland TR626 drum m/c, good cond, £475 the pair, may split. Paul, Tel: (0235) 816783, weekends only.

ROLAND S10, exc first sampler, £350. Kevin, Tel: Moulden (0621) 783226.

ROLAND S220, rackmount sampler, as new, 36 disks, manual, poss. delivery, £450 ono. Miles, Tel: West Midlands (0384) 274923.

ROLAND S330 sampler, £800;

Yamaha QX5 sequencer, £150. Mark, Tel: 081-427 2839.

ROLAND S550, rack sampler, large library, Sony 20" monitor, £800. Loz, Tel: (0359) 31800.

ROLAND U110 sample playback module, £200. Dave, Tel: (0892) 517923.

ROLAND U110 multitimbral sample player, ROM card, boxed, manuals, as new, £290 ono. Geoff, Tel: (0352) 755926.

ROLAND W30, 6 mths old, boxed, as new, £900 ono. Gary, Tel: (0892) 518554.

ROLAND W30 sampler, vgc, £1100 ono. Paul, Tel: 081-855 0403, eves.

ROLAND W30 workstation, disks, stand, f/case, £975; Korg DS8 synth, £325; Boss BX8 mixer, £120. All manuals, leads. Tim, Tel: Portsmouth (0705) 816090, eves.

ROLAND W30, sound library, under guarantee, £700 ono; Boosey & Hawkes alto sax, under guarantee, £450 ono. Redundancy forces sale. Stephen, Tel: (0742) 758720.

SWAP MY ENSONIQ EPS16+ rackmount workstation sampler for your Roland JD800 synth or sell for £1400 ono. Tel: (0429) 222517.

SEQUENCERS

AKAI ASQ10 pro MIDI seq, v2.3, exc cond, £650 ono. Tel: 071-266 1987.

ALESIS MMT8 8-tr seq, mint, psu, manual, £140. Tel: (0703) 220152.

ALESIS MMT8, exc cond, boxed, manual, psu, £130. Tom, Tel: (0228) 710256.

KAWAI Q80, 32-tr seq, disk drive, exc cond, boxed, £400. Howard, Tel: (0235) 73975.

KORG SQD1 seq, tape interface and disks, offers. Peter, Tel: (0706) 58625.

KORG SQD8, 8-tr seq, disk drive, as new, £100. Tel: Romford 733090.

ROLAND MC50, boxed, under warranty, £300; DR550, £100. Selling up. Tel: (0251) 262120.

ROLAND MC50, 4 mths old, immac, £400; Roland R5 drum m/c, £185. Adrian, Tel: 021-458 6934, after 6pm.

ROLAND MC202 micro composer, good cond, manuals, £100 ono. Richard, Tel: Brighton (0273) 541196, eves.

ROLAND MC300, exc cond, boxed, manual, £350 ono. Mark, Tel: 081-943 2722.

YAMAHA QX3 seq, £500; Yamaha RX5 drum m/c, £250; Simmons

SPM8:2 MIDI mixer, £200; Simmons SDS9 electronic drum kit, rack, £600. All good cond, boxes/manuals. Tel: (0633) 273542.

DRUMS

ACID SALE: Roland TR808, mint, £250 ono; Roland TB303, £125 ono; Roland TB303, case, £135 ono; Roland MSQ700 MIDI sync, syncs all the above, £140 ono. Colin, Tel: (0803) 311678 or John, Tel: (0647) 432400, eves only.

AKAI RX10 16-bit drum m/c, good cond, inc manuals and psu, new £400, sell for £300. Paul, Tel: 041-774 5659, after 6pm.

ALESIS HR16, good cond, psu, £150. Glenn, Tel: (0202) 397697.

ALESIS HR16, exc cond, boxed, manual, psu, £150. Tom, Tel: (0228) 710256.

ALESIS HR16B and Roland TR707 drum m/cs, mint cond, £175 and £135 ono. Andy, Tel: (0633) 613342.

ALESIS SR16 drum m/c, boxed, manuals, new, £210. Mark, Tel: 061-747 7070.

ALESIS SR16 drum m/c, vgc, £175. Justin, Tel: 071-272 0573.

BOSS DR550, 16-bit drum m/c, 48 sounds, mint, boxed, manual, psu, £140. Tel: (0703) 220152.

CASIO RZ1 sampling drum m/c, 10 individual outs, sample library, inc AI and 909 samples, £130. Sean, Tel: (0438) 313865.

CHEETAH MD16 drum m/c, under 6 mths old, £250. Paul, Tel: (0525) 403707.

4 ROTO TOMS, stand, black, £85 ono; Simmons SDX mother MIDI station, sampling on-board, 10-piece Zone intelligent pad kit, was £12,000 new, must sell, plus library, £6500. Chris, Tel: Hitchin (0462) 712056.

KAWAI R50 drum m/c, £125. Ricky, Tel: (0475) 30181, eves.

KORG DD5 digital drums, bass ROM card, manuals, exc cond, home use, £100; Korg DDM110 digital drums, £30. Lloyd, Tel: 081-290 1782, eves.

ROLAND TB303 bassline, manual, vgc, £180, no offers; Roland TR727 latin perc. m/c, vgc, £180, no offers. Rupert, Tel: 081-683 4460, eves.

ROLAND TR505 rhythm composer, as new, must sell, £115 ono. Tel: 091-529 4788, anytime.

ROLAND TR606 Drumatix, good cond, £50. Chris, Tel: (0342)

810162.

ROLAND TR626 drum m/c, boxed, manuals, psu etc. Jamie, Tel: 041-954 2832.

ROLAND TR707, immac, psu and manual, £225 ono. Richard, Tel: 081-640 1826.

ROLAND TR727 rhythm composer, MIDI, sync, separate outs, boxed, manual, exc cond, classic techno perc. drum m/c, £150. Bobby, Tel: 071-266 1987.

ROLAND TR808 drum m/c, good cond, £250 ono. Tel: (0424) 220053.

ROLAND TR909, serious offers (around £350). Nick, Tel: (0792) 462502.

ROLAND TR909, exc cond, boxed, manuals, £300 ono. Robert, Tel: 061-368 8969.

ROLAND TR909, exc cond, f/case, manual, £400. Keith, Tel: 031-315 2923 or 031-661 2234.

SIMMONS MTX9 expander, 3 pads, stand, leads, £275. Tel: (0702) 711269.

SIMMONS SDS7 analogue/digital drum m/c, plus seq, must sell, £950. Chris, Tel: Hitchin (0462) 712056.

3 SIMMONS SDS200 pads, boxed, £100; 17 Simmons sound chips, £10. Richard, Tel: Wakefield (0924) 863079.

YAMAHA RX5 drum m/c, 4 sound cartridges, 12 outs, sounds, boxed, manual, £350 ono. Tony, Tel: (0227) 740134.

YAMAHA RX11 and RX21L latin, both exc cond, manuals, £150 both. Richard, Tel: (0272) 671067.

YAMAHA RX17 drum m/c, £85. Mike, Tel: 081-472 7566.

YAMAHA RX21 drum m/c, 9 drum sounds, exc cond, boxed, manuals, £120. Tel: (0740) 22433.

YAMAHA RX21, manuals psu, as new, vgc, £80 ono. Richard, Tel: (0535) 681608.

YAMAHA RX120 drum m/c, exc cond, boxed, £75. Howard, Tel: (0235) 73975.

COMPUTING

ATARI 520STE, upgraded to 1Meg, SM124 hi-res mono monitor, Atari Megafile 60 hard drive, PC286 emulator card, £750. Chris, Tel: Bideford (0237) 477748.

ATARI 1040ST, colour monitor, Pro24 v3, games, accessories, as new, £550. James, Tel: Maidenhead (0628) 20496.

ATARI 1040ST, SM125 monitor, 40Meg hard drive, C-Lab Notator,

Roland D5, Boss DR550 drum m/c, Boss BX60 mixer, leads, stand, boxed, £900 ono. Matt, Tel: (0705) 595235.

ATARI 1040ST, SM124 hi-res monitor, 30Meg mega file disk, £450. Martin, Tel: (0734) 780331.

ATARI 1040ST, SM124 monitor, Notator s/w, £500. John, Tel: (0843) 228038.

ATARI 1040ST, monitor, Creator v3, £550. Chris, Tel: 071-586 7746, days.

AMIGA 500, 2Meg RAM, Music-X, sampler and s/w, MIDI interface, £500 ono; Disney animation s/w, GenLock, £150 ono. Tim, Tel: (0273) 698555.

C-LAB CREATOR, v3, manual, dongle, case, £160; Steinberg FZ sample editor, original, £120. Tel: (0744) 35567.

C-LAB NOTATOR, v3.1, latest version, £300. Tel: (0923) 229034.

DIGIDESIGN SOUND TOOLS Atari analogue interface, £450; Opcode Studio Vision s/w, v1.2, £350; Vision s/w, v1.2, £150. Rosie, Tel: 071-608 2282.

DR T'S D10/D110 editor, 2000 sounds (32 banks), £40; large FZ1 library, disks to swap. Andy, Tel: Leeds (0532) 430177.

FOR SALE: Steinberg Pro24, dongle/manual, £70. Derek, Tel: 081-311 8124.

FREESTYLE pro realtime arranger, Atari ST, creates pro backing tracks, manual, £90. Tel: 021-358 7612, after 6pm.

JORETH MUSIC SYSTEM for Commodore 64, MIDI interface, Composer, Linker, System 7 editor, cost £400+ must sell, £80 ono. Tel: 091-529 4788, anytime.

HYBRID ARTS EDIT-TRACK ST seq, 60 track graphic editing, cost £175, sell £55 ono. Len, Tel: Faringdon (0367) 240732.

MICROVITECH CUB 452 RGB colour monitor for BBC computer, £100; Dr T's Roland D110 editing s/w, Atari, both as new. Tel: (0923) 31866.

STEINBERG PRO24, genuine copy, with dongle, £35. Simon, Tel: (0246) 822244.

STEINBERG PRO24 sequencer, v1, v2 and v3, Atari 520/1040ST, dongle, v3 manual, cost £240 new, only £80 ono. Matt, Tel: (0623) 751528.

STEINBERG PRO24, as new, £50. John, Tel: Maidstone (0622) 812423.

STEINBERG PRO24, v3, ST, boxed, key and manual, £50. Steve, Tel:

(0983) 298969.

TOSHIBA T3100E laptop computer, 286, 1Meg, windows, perfect PC MIDI workstation. Gary, Tel: 051-327 2296.

YAMAHA CX5M computer, large keybd, SFG05, Bit2, data recorder, 15 games, Composer, FM, DX7 cartridges, voice and sequence cassette, art s/w, exc cond, boxed, manuals, £120. Tel: (0740) 22433.

YAMAHA YRM103 voicing program for DX7, £20. Richard, Tel: Wakefield (0924) 863079.

RECORDING

ALESIS MICRO ENHANCER, 16-bit for added sparkle, £60. Pete, Tel: 061-428 3022.

ALLEN & HEATH SYSTEM 8 16:8:16, exc cond, £550. Tel: 061-483 8551, anytime.

BOSS BX16 16-ch mixer, 3 mths old, hardly used, under guarantee, £325 ono. John, Tel: (0253) 873716.

CARLSBRO PMX8:2 powered mixer, 2 JBL G733 performance series spks, JBL stands, £1400. Rod, Tel: (0483) 578204.

CASIO DA2 DAT m/c, perfect order, £400. Ali, Tel: 071-937 7354.

CASIO DA2, mint, boxed, £400 ono; Studiomaster 16:8:16:2 Proline Gold, mint, £1150 ono; Pearl 9-shell drum kit, exc, w/hardware, £600 ono. Paul, Tel: (0543) 425573.

DENON DTR2000 DAT m/c, 20-bit, 48kHz sampling rate, only wks old, £500, no offers. Tel: Skegness (0754) 765871.

DIGITECH REVERB fx unit, programmable, flange, bounce, delay, echo, good cond, £200. Joseph, Tel: (0582) 415549.

DOD FX90 delay pedal, £99. Craig, Tel: (0324) 25531.

DYNAMIX 12:2 mixer, boxed, as new, £200. Tel: Nottingham (0602) 504052.

FOSTEX E8, mint, never used, £1500 ono. Adrian, Tel: (0204) 363545.

FOSTEX M80, boxed, manual, £800 ono. Robert, Tel: 061-368 8969.

PEAVEY UNIVERB, 128 presets, good cond, boxed, £200. A Prentice, Tel: 031-440 1774, 8.30am-4.30pm office hrs.

ROLAND DIMENSION D chorus, £350. Tel: 071-430 2840.

SECK 10:4:2 mixer, vgc, £250 ono. Robert, Tel: 061-368 8969.

SECK 12:8:2 mixer, cables, £650; Sansui MR6 6-track, £300; Alesis

Midiverb III, £200; Fostex 3013 patchbay, £35; 6U f/case, £40. All exc, boxed, manuals. Keith, Tel: 031-315 2923 or 031-661 2234.

SECK 12:8:2, mint cond, £490. Paul, Tel: (0257) 426925, anytime.

SECK 18:8:2 desk, f/case, vgc, £650. Tel: 081-998 2735.

SECK 18:8:2 desk, exc cond, £849; Fostex 8:4:2 mixer, £250. Tel: (0772) 740381.

STUDIO FOR SALE: Studiomaster 24:8:16:2, Fostex R8, Atari 1040/Creator/Unitor, digital fx, FZ1 sampler/library, D110, more, £5500. Matt, Tel: (0533) 870698.

STUDIOMASTER MIXDOWN 32:4:8:2, exc, muting, upgrading to 16-track, offers. Tel: (0272) 466880.

STUDIOMASTER MIXDOWN GOLD 18:8:2 desk, Fostex R8 8-track recorder, never used, as new, £3100 ono. Tel: (0473) 603335.

STUDIOMASTER PROLINE GOLD 8:4:8 desk, hardly used, £450. Robert, Tel: (0442) 827776.

STUDIOMASTER PROLINE 16:8:16 mixer, 12 mths old, £900 ono; Fostex R8 8-tr reel-to-reel, 12 mths old, home use, £900 ono; EVS1 sound module, £160; HR16B drum m/c, £150; Roland MT32 sound module, £150. Tel: (0462) 481874.

STUDIOMASTER PROLINE 16:8:16:2 mixer, 4 auxs, 36 inputs on mixdown, boxed, as new, manual, £950; Roland PC200 keybd, £150. Colin, Tel: 081-878 0512.

STUDIOMASTER SERIES II 16:16:2 desk, Tannoy DC200 spks, Drawmer gates, compressors, Quadraverb, SPX90, Aphex C, Revox B77, Roland D550, MKS70, JL Cooper MixMate, other gear. John, Tel: (0602) 414488.

TASCAM 38 reel-to-reel recorder, vgc, £850; Fostex 454 desk, 8:4:2, ideal 8-track recording, £350 ono. Lee, Tel: (0895) 637591.

TASCAM 38, recent full service, £800. Tel: (0364) 42633.

TASCAM 38, half-inch, 8-track, exc cond, recently serviced, £775 ono. Andy, Tel: (0633) 613342.

TASCAM 238 syncassette and loom, 8 tracks on cassette, £650; DX21, £140. Ian, Tel: (0772) 37722.

TASCAM 244 portastudio, manuals, exc cond, home use, £120; Audio Technica Pro4 mic, unused, £15. Lloyd, Tel: 081-290 1782, eves.

TASCAM 244 portastudio, perfect cond, £275 ono. Alan, Tel: (0273) 870179.

TASCAM 246 portastudio, immac, hardly used, c/w manuals, remote etc, £450 ono. Tel: (0942) 48775.

TASCAM 328, half-inch, 8-track recorder, as new cond, £995 ono; Ibanez Musiam guitar, £300 ono; Peavey Deuce guitar amp, £250 ono. All exc cond. Robbie, Tel: (0560) 20210, anytime.

TASCAM PORTA 05 HS, £230; rackmount 8-ch mixer, £100; DRV1000 digital reverb, £150; Yamaha DX7, 3 ROMs, £400; Roland SH09, £70; Kawai SX240 rare MIDI analogue, offers; Roland TR808, £260; Roland TR626, £130; Squier Strat, £120. Trev, Tel: 071-731 6108.

TEAC A3440, 4-tr reel-to-reel, remote and tapes, exc cond, £350. Brad, Tel: (0633) 365758.

TEAC A3440, 4-tr recorder, dbx RX9 n/r, as new, £400. Tim, Tel: (0223) 60486.

TEAC A3440S, 4-tr recorder, good order, £275; Sequential Circuits Drumtrax, exc, £150. Tel: (0203) 544003.

UREI 1176, £625 ono; Neumann U87AI, £750 ono; dbx Silencer, £125 ono; Drawmer 1960 valve compressor, £700 ono; Alesis 1622 mixer, £440 ono; Teac 2A mixer, plus meter bridge, £150; Axxeman, £115 ono; Zoom 9002, £185 ono; Akai S1100, £2700 ono. Tel: 081-462 6261.

YAMAHA DRU8, 20-bit 8-tr digital recorder, £9000 ono. Rosie, Tel: 071-608 2282.

YAMAHA FX500, plus MIDI foot controller, brand new, £725; Yamaha MV802 rack mixer, £250; TC chorus pedal, £80. Steve, Tel: (0274) 635233.

YAMAHA MSS1 MIDI sync, SMPTE-to-MIDI, £140 ono. Philip, Tel: 071-371 2460.

YAMAHA MT100II multitracker, mint, boxed, manual, psu, £250. Lee, Tel: Wigan (0942) 714268.

YAMAHA REV7, £400. Tel: (0932) 570214, eves.

AMPS

ALLIGATOR, mega loud guitar amp, AP150W, exc, £200. Tel: (0740) 22433.

CARLSBRO COBRA 90W kbd amp, good cond, cover, £175 ono. Tim, Tel: (0707) 872886.

CARLSBRO COBRA 90W bass amp, hardly used, £220; Carlsbro Cobra 90W lead amp, £200. John, Tel: Maidstone (0622) 812423.

CARLSBRO COLT 45 kbd combo,

church use only, £130; Peavey Pro/150 spks, pair, £140. David, Tel: (0483) 570088, days/(0486) 76524, eves.

FENDER BANDMASTER valve guitar amp, cabs, £150 ono; Peavey Backstage 30 guitar amp, £80 ono; Sound City 200W valve amp, £140 ono. Chris, Tel: Hitchin (0462) 712056.

LANEY AOR5012 50W combo, exc cond, £295. Tel: (0562) 67666.

MARSHALL 8015, 150W kbd amp, as new, £250. Tel: (0892) 517923.

MUSIC FIDELITY P170 amp, sounds warm, immac, box, hardly used, £750 new, £395. Simon, Tel: 071-537 6168, after 8pm.

PAIR LANEY LINEBACKER 65 amps, home use, exc, 2 for the price of one, £275. Tel: (0260) 280131.

PEAVEY KB100 kbd combo on wheels, immac, £200. Andy, Tel: North Surrey (0932) 245298.

PEAVEY KB300, hardly used, £350. Tel: (0382) 532338, nights only.

ROLAND JAZZ CHORUS 120 combo, exc, great amp for live kbds, 2 ch, stereo chorus, reverb, ungigged, 18 mths old, poss. delivery, £395. Anthony, Tel: (0274) 615824.

ROLAND JC120 kbd combo, stereo chorus, reverb, distortion, footswitches, f/cased from new, exc cond, £425. Tel: Brighton 870560.

YAMAHA P2250 amps, x2, 250W per channel, £340 each ono. Tel: Nottingham (0602) 504052.

PERSONNEL

BASED IN GLOUCESTER OR GLOUCS, requiring synth players, vocalist to form band. Anybody considered. Paul, Tel: Gloucester (0452) 415398.

FEMALE VOCALIST with powerful voice needed urgently for dance high energy band. Female dancers also needed. Neil, Tel: (0204) 46709.

GUITARIST seeks kbd player/synthesist with Minimoog for ambient rock/space rock band. Influences: Eno, Tangerine Dream, The Orb, Floyd, Can and Hillage. Howard, Tel: (0274) 498047.

HARD CORE TECHNO PEOPLE required to produce and release mad music. Trev, Tel: 071-731 6108.

NAMED PROFESSIONAL digeridoo/kbd act require inspired world percussionist (drummer) for immediate performance and

recording. Tel: (0424) 33205/213474.

SINGER/SONGWRITER seeks other musicians/vocalist in W London area for poetic/political AOR band. The The, Gabriel, Knopfler. Commitment essential. Tel: 071-385 6989.

SYNTH PLAYER/PROGRAMMER wanted to create uplifting and hard tunes/techno. North West area. Rich, Tel: (0978) 780620, after 6pm.

TECHNO '60S CROSSOVER BAND, acid house, acid rock, dub, disco, indie, any instrument. Recording imminent. Andrew, Tel: (0892) 543499.

£200 REWARD. Brother-sister wow-pop duo. Rave gear, reviews, video etc. NY Lawyer. Very different songs. Need leads on versatile guitarist, bassist now! Send fax, phone, address to: UK Move, 5215A Yonge Street, Toronto, Canada M2N 5P7.

MISC

CARLSBRO STINGRAY multi-chorus combo, £125; Chase Bit1 synth, needs minor repair, £135. John, Tel: (0843) 228038.

DAN ARMSTRONG GUITAR clear plexiglass, beautiful cond, offers. Write: Joe, 621 Black Friers, Sudbury, Suffolk CO10 6AQ.

GIBSON FLYING V, black, exc cond, case, £550. Tel: (0938) 76350.

HEXTRUM 12-STRING acoustic guitar, hard case, superb tone, good cond, £400 ono. Tel: (0942) 48775.

MUSIC TECHNOLOGY back issues, all issues between 1989-1991, also various vintage issues E&MM 1985-1988. Richard, Tel: 081-640 1826.

100 PRE-RECORDED cassette albums, all originals, no copies, list incs Pet Shop Boys, Depeche Mode, OMD, Wham!, Psychadelic Furs, Frankie rarities etc, £200 ono. Lloyd, Tel: 081-290 1782, eves.

PLANET EARTH RECORDS, new independent record label, specialising in all types of dance music, are requiring tracks for future release. Send demo cassettes, DAT or white labels to: Planet Earth Records, 3 Mayflower Cottages, Standish, Wigan, Lancs WN1 2UR.

ROLAND VOCODER SVC350, good cond, recently calibrated, £450 ono. Keith, Tel: (0450) 76131, eves.

SWELL PEDAL, £75; sustain pedal, £25; collection of MIDI cables, £10; keybd stand, £10; Korg sequencer, £130. Tel: Warwick (0926) 494748. Tel: Warwick (0926) 494748.

WANTED

ALESIS DATADISK SQ MIDI data storage playback unit. Tel: Portsmouth (0705) 376700.

ALESIS MIDIVERB II or ART Multiverb III, £100 cash waiting. Steve, Tel: (0727) 868023.

CASIO FZ1 disks to swap or exchange. Andy, Tel: Leeds (0532) 430177.

CASIO FZ1 or Hohner clone. Kevin, Tel: Moulden (0621) 783226.

CRUMAR DP80 circuit diagrams, will pay postage and photocopy costs. Mike, Tel: 081-346 4581.

ENSONIQ SQ1+ or SQ1 or SQr, cash waiting. Ricky, Tel: (0475) 30181.

HAS ANYBODY GOT an EMS Synthi fx unit, pref working, must be in original glass-fibre casing, 2 pedals. Steve, Tel: (0983) 298969.

HEAD-SET RADIO MIC, eg Shure SM10A. Matt, Tel: (0533) 870698.

ITA 16-TRACK, 1" reel-to-reel tape recorder, I want manual and remote. Nick, Tel: (0704) 542166.

KORG MONOPOLY, must be good cond, cash waiting. Dave, Tel: 081-997 1277.

LINN 9000 sampling drum m/c and sequencer, possible drum samples, £700 cash waiting. Paul, Tel: (0536) 761014.

ROLAND 100M modular system or modules, will p/x analogue equipment or pay cash. Bob, Tel: (0726) 67836.

ROLAND 2500 DDL, swap for Roland 1000 DDL, with cash adjustment. Tel: 061-799 6154.

ROLAND PG10 programmer for D110 needed urgently, will pay around £60. Neil, Tel: (0204) 46709.

ROLAND RD250S or Rhodes MK60 electric piano. Tom, Tel: (0606) 44240.

ROLAND W30, will pay around £900. Paul, Tel: (0302) 538304.

SEQUENTIAL MULTITRACKS. Nat, Tel: (0892) 522461.

SEQUENTIAL PRO1, will swap for my Roland SH101. Alan, Tel: 091-263 5135.

SEQUENTIAL PRO1. Paul, Tel: (0257) 426925, anytime.

SEQUENTIAL PROPHET 1 exc cond, £120 cash waiting. Andrew, Tel: 081-446 5354, after 5pm any day.

SEQUENTIAL PROPHET VS, must be immac, manuals, cash waiting. Tel: 021-777 6090.

STEINBERG KEY EXPANDER wanted. Richard, Tel: 081-640 1826.

STEINBERG KEY EXPANDER wanted, good cond imperative. Richard, Tel: 081-640 1826.

STUDIO GEAR WANTED, cash waiting, all types of gear required for opening private studio. Royston Hollier, Tel: 061-273 5480.

URGENTLY WANTED: MPG80 programmer for MKS80. A Prentice, Tel: 031-440 1797, 8.30am-4.30pm office hrs.

YAMAHA SPX50D or SPX900 wanted, cash waiting. Tel: 061-483 8551, anytime.

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