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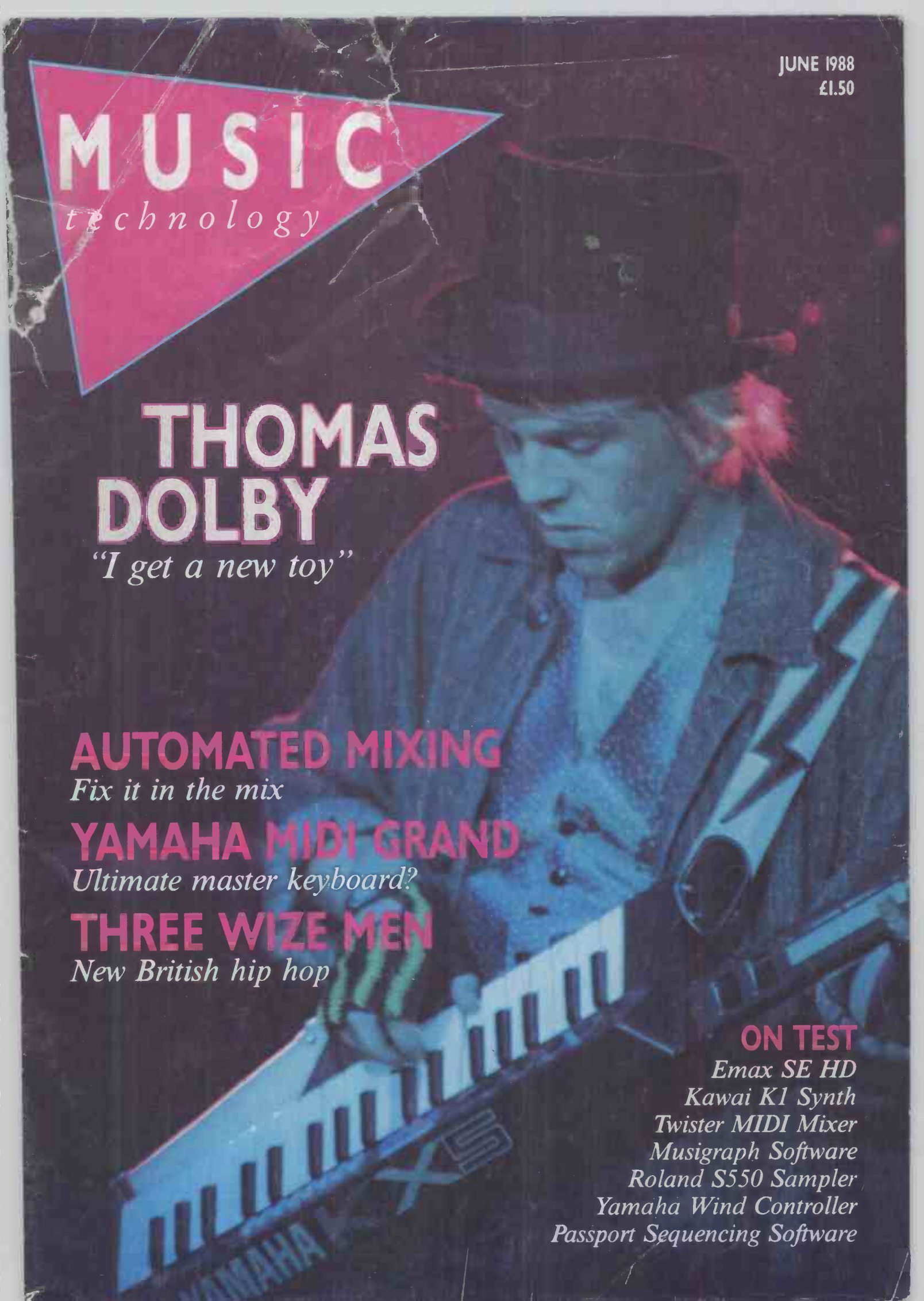

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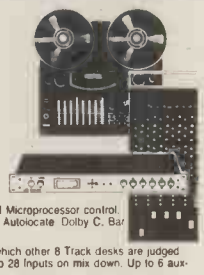

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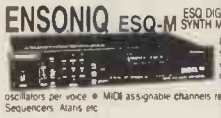

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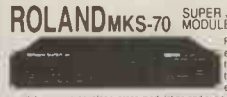

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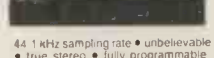

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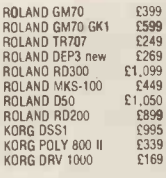

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DO YOU COPY?

TO SOME OF you, the news that DAT – Digital Audio Tape – machines are now available in Britain won't be all that fresh. But whatever you know about DAT, *the system*, nobody really seems to know too much about DAT, *the controversy*.

Perhaps a little background is in order. Briefly, the DAT system allows you to record a digitally encoded representation of an analogue signal – music if you like – that can then be converted back into an analogue signal for playback. The main advantage of this system is that it avoids the problems of signal degradation normally associated with successive generations of copies of music – from multitrack master to mixed master to duplicate mixed master to vinyl pressing to cassette to play in the car . . . Bear in mind that an analogue signal is subject to distortion at all stages of copying and that tape noise (hiss) builds up as the square of the number of times the recording has been copied. By eliminating noise and distortion DAT offers to improve the quality of the tape recordings we regularly use in our lives. Sounds good, doesn't it? But there are problems.

The practical problems that arise are not problems associated with the design or manufacture of the equipment, as you might imagine, but ones of copyright. Said the IFPI (International Federation of Phonogram and Videogram Producers): "The master-quality copying of our copyrighted sound recordings by DAT recorders threatens the future ability of our industry to create and produce recorded music." The IFPI are obviously convinced that the introduction of DAT wil open the floodgates on bootlegging. Sounds like the compact cassette scare all over again.

Because the Japanese stood to benefit from the success of DAT they seemed less than eager to become involved in anything that might handicap it. And, of course, they'd be the ones that had to build any copy-protect circuitry into DAT machines. The British and American record companies, on the other hand, were (and still are) frightened.

The original proposal for a copy-protection system came from CBS and was called Copycode. The idea was to remove a band of frequencies from the recording – within the audio spectrum – which a suitably-equipped DAT recorder would detect and then drop itself out of Record mode for 20-30 seconds. CBS claimed this notch didn't impair the quality of the recording. George Martin agreed – but seemed to be the only one. Then Sony bought out CBS . . .

The latest proposal is called Unicopy and is intended to limit the number of DAT copies that can be made from a CD. Reading between the lines, it seems to go something like this: there is a facility included, but currently unused, to include a "flag" in the CD datastream. This could be used to tell a DAT machine when to permit a recording and when not to. There is also the alternative of inserting this flag into the datastream recorded on the DAT cassette (whether the recording is being made from a CD, LP or another tape), thus preventing further copies being made of it. Just how it is hoped to juggle these facilities to allow you to make only one copy of any legitimate recording you've purchased is someone else's problem. Whether one copy of an album you've paid good money for is enough, is yours.

Now, I don't particularly want to see the record companies deprived of their royalties – even if the stranglehold the majors have on music is an unhealthy one. And I certainly don't want to see musicians and songwriters deprived of theirs, but who is a copy-protection system going to affect? It's certainly going to stop you and I freely making DAT copies of CDs *we've already paid for* for use in our car DAT players, personal DAT stereos and so on. But is it going to deter the organised bootleggers? It's not worth our while to interfere with a new DAT recorder to enable us to freely copy recordings – assuming we know what we're doing and the equipment survives the ordeal, the guarantee has certainly been invalidated. But it's most definitely worth the while of the big-time bootlegger to sort out which chip to remove or devise a "copy protect defeat" system. The result would be to prevent domestic copying of CDs and slightly inconvenience commercial bootlegging. If for "domestic" you read "harmless" and for "commercial" you read "damaging" you'll be far more enlightened than the record industry at this point in time. ■ Tg

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MUSIC TECHNOLOGY (US) *is published by Music Maker Publications Inc, 22024 Lassen Blvd, Suite 118, Chatsworth, CA 91311. Tel: (818) 704-8777. (PAN: Musictech)*
Typesetting by *Camset, Ely.* **Colour reprographics by** *CLE, St Ives.* **Printing by** *Worcestershire Web Offset, Droitwich, Worcs.* **Distributed by** *Magnum Distribution, London. Tel: 01-253 3135.*

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AHB 18:2:1 Second User £599

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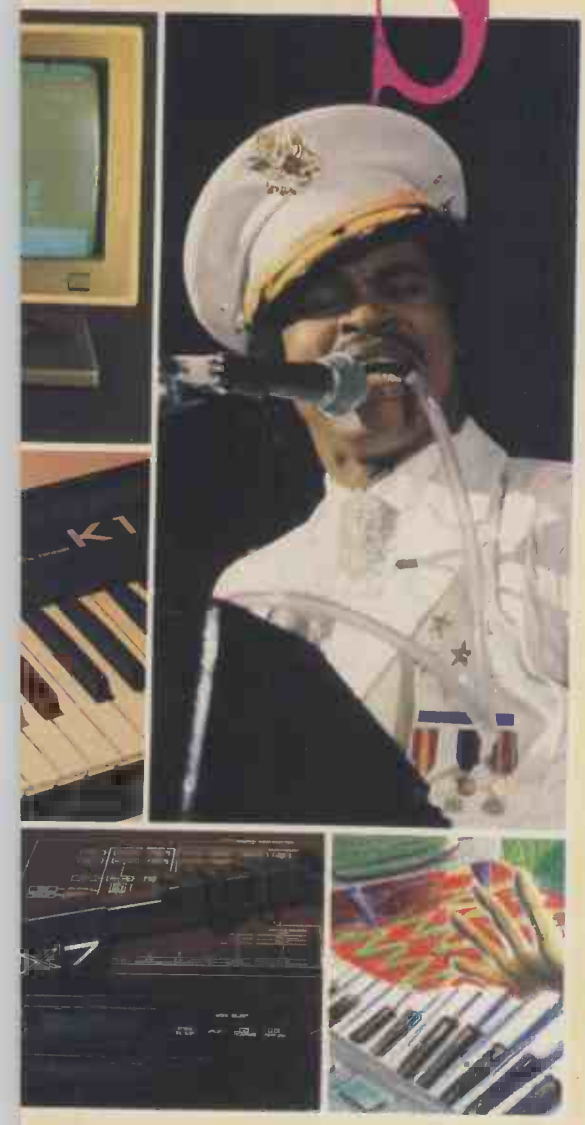

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NEWSDESK

FZ FREEBIE

The FZI Club is making available a single-track optional software sequencer to members as part of its Public Domain disk library.

The software is mainly intended to load sequences via the MIDI In socket into the FZI, but it can also be used as a real-time recorder (instructions are provided). Sequences are then saved to disk and recalled as a Demo Play on the FZI's Opt Software page; they can also be stored on the appropriate library disk and recalled without having to reload the sequencer.

Both software and instructions are available to members who send in a blank disk and £2.50 handling charge to cover copying and return by registered post.

More information on the FZI Club can be found in March '88 Newsdesk; membership costs £25 a year and will soon confer the benefit of FZI accessories at discount prices . . . get yourself in the Club. ■ **Dp**

TRY BEFORE YOU BUY

Gigsounds of Catford are offering interested punters a foretaste of the Zyklus MIDI Performance System.

Two demo videos are available for rent or purchase so you can see what the MPS is capable of before you stump up the cash. The first, entitled *The MPS – An Insight* is a 40-minute demonstration of some of the features of the MPS; the second, *The answer, now what's the question* is a 15-minute overview. The 40-minute video is also supplied with every MPS sold.

If you're really serious about the MPS, you might like to take advantage of Gigsounds' two-week rental scheme. You get to keep the MPS for a home trial for the sum of £65.

For further info, the videos, or a brochure, contact Gigsounds Catford on 01-690 8621, or write to 22 Rushey Green, London SE6 4AS. ■ **Dp**

GET NETWORKED

Advanced Recording Concepts of Hampshire (see Newsdesk, April '88) are launching a new service intended to help professional musicians stay in touch with technology; the service will be called the Professional User Network (PUN).

PUN will provide a range of services to support the professional musician using modern technology; services will include information, in the form of newsletters and product release bulletins. Advice and a range of software support, including user groups, will also be forthcoming.

The range of services offered is likely to remain open-ended to facilitate development in line with the needs of PUN's members.

Registration for the network is free, and details can be obtained from Advanced Recording Concepts at Bell House Studios, Turk Street, Alton, Hampshire GU34 1EF. Tel: (0420) 541199. ■ **Dp**

SYNDROMIC SHOW UP

Syndromic Music will be exhibiting a range of products based around the Atari ST at this year's APRS show. This will include the latest addition to ADAP from Hybrid Arts.

ADAP2 is a direct to hard disk recording system which is able to record up to 45 minutes in stereo at 44.1kHz. Comprehensive editing features are available. Full SMPTE synchronisation is offered and AES/EBU digital transfer allows ADAP2 to be used as a DAT editing tool. As well as these features, ADAP2 offers all the facilities which were available on ADAP1 (reviewed MT, October '87), plus the mixing of an indefinite number of tracks in real time. ADAP2 will retail at £2699.95 including VAT, with owners of ADAP1 being offered the chance to upgrade to ADAP2 for the difference in price between retail of ADAP1 and ADAP2 (£900).

Also on display at APRS will be Hybrid Art's SMPTE Track 60-track MIDI sequencer including SMPTE Read/Write generator, retailing for £499.95, and SYNC Track, which includes tape sync and clocking hardware (but not SMPTE generation), and the same level of software as SMPTE Track. This retails for £299.95. Both these packages may be extended by MIDIPlexer, which provides the Atari ST with 2 MIDI Ins, MIDI Merge for all data, plus 4 MIDI Outs, allowing the use of 64 separate MIDI channels. MIDIPlexer retails for £279.95 including VAT.

Genpatch, the generic SysEx librarian, currently supporting over 70 types of MIDI units, will also be there, along with EZ-Score Plus scoring software operating with Hybrid Arts sequencer files (RRP £129.95). MIDI Score and MIDI Score Plus, which allow up to 60 staves to be accessed with many more fonts, printer drivers and increased editing features, will also be on display. MIDI Score Plus supports laser printers, allowing publishing-quality scores to be printed, and retails at £279.95. MIDI Score is available at £229.95.

Syndromic are exclusive distributors of Drumware products in the UK, and the Drumware SoundFiler range of sample waveform editors for Akai S612, S700/X7000 and S900 will be on show. Drumware also have new products in the GenWave range; GenWave 12 supports all 12-bit samplers, including Emax, SP1200, Prophet 2000/2, Akai S900, Oberheim DPX1 and Yamaha TX16W, plus instruments with the MIDI Sample Dump Standard. The GenWave series are translators/editors for all samplers and will allow samples taken from one unit to be downloaded to another manufacturer's sampler. A 16-bit version of this software will also be available.

More from *Vince Hill or Bernard Jones, Syndromic Music, 24-26 Avenue Mews, Muswell Hill, London N10 3NP. Tel: 01-883 1335.* ■ **Dp**

SUSURREALISTS

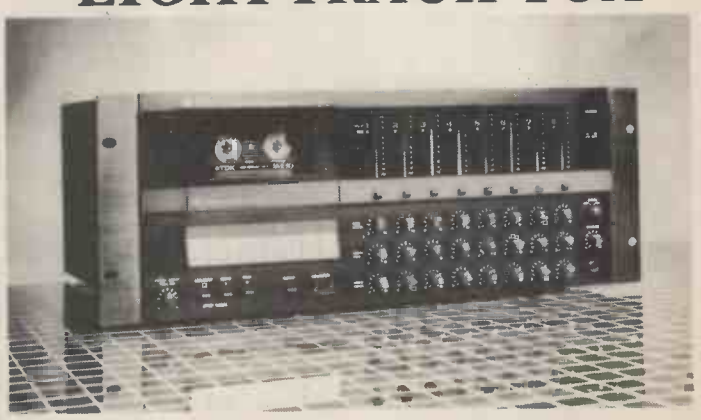
How about combining a well-earned holiday with a week or two of recording in a fully-equipped 16-track studio? Pete and Joanna Forrest of Susurreal Studios in Devon are offering just that, and rates start from a moderate £200 for full board and tuition, and lots of studio time.

Brand-new equipment at the studio includes Fostex E16, Steinberg Pro 24, Sony digital mastering, 36-channel mixing, a comprehensive selection of effects, and a good range of new and old synths, from the ARP Avatar to Yamaha TX81Z, and the Roland 100M modular system to the MT32.

The studio is custom-built, no parallel surfaces, and with a huge triple-glazed window so you can take in the countryside surroundings while you're recording.

Recent satisfied customers have included an un-named pop duo, a video soundtrack writer, a systems musician and the writers of a musical. If you want to check out Susurreal, contact Peter or Joanna Forrest on (036 32) 4627, or write to Susurreal Studio, Sandford, Crediton, Devon EX17 4LR. ■ **Dp**

EIGHT-TRACK TOA



Hot on the heels of TEAC's Tascam 238, TOA are announcing the launch of their own eight-track cassette-based recorder.

The MR8T is a convenient 19" rack-mounting unit and provides eight audio tracks by using two separate four-track heads. The built-in monitor mixer has insert points and allows the unit to be used without external mixing. Onboard noise reduction is included in the form of the dbx system and the MR8T uses C30 through to C90 tapes (high position type II) and runs at 9.5cm/second. The machine will cost £1194.67 plus VAT.

More from *TOA Electronics Ltd, Tallon Rd, Hutton Industrial Estate, Brentwood, Essex CM13 1TG. Tel: (0277) 233882.* ■ **Dp**

US DESIGNS ON UK

Evenlode Soundworks have been appointed exclusive agents for Digidesign products in the UK and are announcing the imminent availability of new programs.

Several new Digidesign programs for the Atari ST and Apple Mac are about to be released, including Universal Sound Designer (£315), a generic sample editor for the ST and the Mac, which will operate with most manufacturer's samplers, allows sounds to be transferred between machines, and offers full editing facilities. Also in the offing are Turbosynth (£235), an advanced sound creation program for the Mac, FX Designer, an editing program for the Lexicon PCM 70 running on the Mac, and the Sound Accelerator card, a digital signal processing card also for the Macintosh.

Evenlode will also be handling Turtle Beach Software's SampleVision software for the IBM PC (handled in the US by Digidesign).

More from *Evenlode Soundworks, The Studio, Church St, Stonesfield, Oxford OX7 2PS. Tel: (099 389) 8484.* ■ **Dp**

MORE WAYS OUT

For those of you out there with a Kurzweil 250 or 250 RMX, Kurzweil Music Systems have announced the release of a Separate Output Option kit which adds 12 direct monophonic audio outs to their instruments. The kit comes in the form of a new rear panel, two circuit boards, a connecting ribbon cable, new software (eight ROM chips) and accompanying documentation.

The new software provides, apart from output access, improved channel-stealing capabilities, and provision for sending MIDI program change commands to external devices on all 16 MIDI channels.

Separate outputs may be ordered as an option when buying a new 250, or can be added as a retrofit (tentative price £895), though units from 1984 or earlier may need a CPU upgrade.

More from *Kurzweil UK (part of the CS International Group), Potash House, Drayton Panslow, Bucks MK17 0JE. Tel: (029 672) 787/8.* ■ **Dp**

GOING SOLO

The 27th-30th July will mark the finals of the International Performance Competition at the Second Electro-acoustic Music Festival to be held in Newcastle-upon-Tyne.

The competition offers a £1000 prize for the winning solo instrumental or vocal performance of electro-acoustic music. Performers may use backing tapes or live electronics for their performance and the only restriction on entry is that you must be under 35 on 1st January, 1988. The idea behind this apparently obscure ruling is to promote interest in performers near the start of their career rather than established musicians.

More from *Electronic Music International Performers Competition, c/o Douglas Doherty, Dept of Music, The University, Newcastle-upon-Tyne NE1 7RU.* ■ **Tg**

PRODUCING MASTERPIECES

New dates on the Thatched Cottage Producer's Masterclasses (see Newsdesk March '88) include Mike Pela (Sade, Fine Young Cannibals) on May 29th, and Chris Tsangerides (Black Sabbath, Gary Moore, Samantha Fox) on July 3rd. John Leckie (Simple Minds, XTC, The Fall) is expected to do a class in June, along with Rupert Hine and JJ Jeczalik; Mike Howlett is expected to hold a class in July, Wally Badarou (Level 42) in September, and John Porter (Billy Bragg, The Smiths, The Alarm) and Stephen Hague (Pet Shop Boys, New Order) once again in October.

The classes are held at the Thatched Cottage Audio 24-track studio in Royston, near Cambridge. They are run on Sundays between 11am and 5pm, and cost £50 plus VAT. For information and booking, contact Paul Tingen on 01-249 1876 or Thatched Cottage Audio on (0223) 207979. ■ **Dp**

ON THE RIGHT TRACK

Audio Digital Technology have moved into the PC music software market and will now be handling the Voyetra range of software. ADT will also be expanding into hardware and MIDI Workstations.

The company will be specialising in music software for the IBM PC, and will be supplying a complete range of hardware and software covering all aspects of MIDI. Complete computer-based MIDI workstations will be offered, and can be tailored to individual needs, preferences and budgets.

In addition to Voyetra Technologies, ADT are exclusive distributors of Twelve Tone Systems, MIDI Concepts, Magnetic Music, Imagine, Bacchus, Music Quest, Lyre and Music Feature. They also have available the IBM Music Feature card, offering 336 different stereo FM-generated voices and a MIDI interface on one PC expansion card.

MT's review of the Voyetra Sequencer Plus last month omitted to point out that the stripped-down versions of this software, Mkl and MkII, may be upgraded to higher versions simply by paying the difference in the retail prices. As the new distributor of Voyetra software, ADT are offering this service to customers.

Voyetra have also been granted an exclusive license to develop and distribute M/pc for the IBM PC, by the original developers, Intelligent Music. The PC version of M will be virtually identical to the original, and will read and write music files in Voyetra's Sequencer Plus Format, as well as the MIDI file format, so that it will be possible to combine it with any member of the Sequencer Plus family to provide a powerful editing/sequencing/interactive composing environment for the IBM PC, XT, AT and compatibles. M/pc will require a computer equipped with at least MS-DOS 3.0, Microsoft Windows 2.0, a Microsoft-compatible mouse, a graphics interface, minimum of 512K RAM and an MPU-compatible MIDI interface. Worldwide distribution is scheduled for August.

More from *Jim Dowler or Roger Evan at Audio Digital Technology, The Coach House, 6 Manor Road, Teddington, Middlesex TW11 8BG. Tel: 01-977 4546.* ■ **Dp**

WRITE ON CD

The Tandy Corporation have announced what could be a major breakthrough in optical disc technology; Tandy-Thor CD allows the recording *and* erasing of digital information on a CD-compatible optical disk.

The new disc will allow repeated record, playback and erasure of music, video and other data, using a laser beam, onto a disc that is playback compatible with all existing CD audio and CD-ROM players.

What might be more important to the average musician is the fact that the Tandy-Thor CD is expected to be very inexpensive, indeed less expensive than alternative digital audio formats, including DAT. Initial estimates from the Tandy Corporation suggest that in the early years of development, play and record decks should be available at under $500.

The Tandy-Thor CD retains all the qualities of the current CD standard, using the same system of microscopic pits read by laser beam. However what makes the new CD different is that the pits are stable and permanent in nature, but can also allow multiple erasures for editing and re-recording. Extensive testing by the Tandy Magnetic Media Research Centre in California has confirmed the CD's ability to record and play back digital information with virtually no degradation.

The practical applications of the media in the music industry are obvious and extensive. Apart from audio uses, Tandy also project wide-ranging applications for the technology in the high-density data storage field, with storage capabilities of hundreds of megabytes per 5" disc. Access time to the CD is at present comparable to that of floppy disks, with access time for the future showing promise of becoming comparable to that of hard disk.

What remains to be seen is whether the new technology will escape the copyright faction or run into the same legal and ethical wrangle as Digital Audio Tape. Some degree of opposition seems almost inevitable, especially given the projected low cost of the Tandy-Thor CD.

The project is still in development and no dates as to the launch of a record/erase CD player have been released. ■ **Dp**

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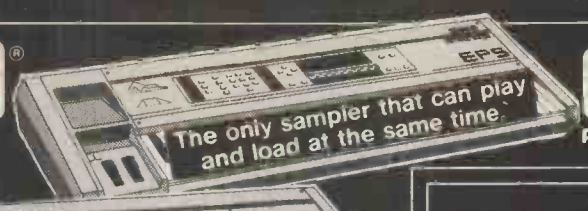

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Dear MT

Played Out

I was interested to read the opening paragraph of your review of the Akai EWI. I agree wholeheartedly with the first part, but I feel that the last line should have read "Nobody today has the playing skills necessary to play expressively . . .", rather than blame lack of expressiveness on synths.

These days, synths come equipped with velocity and pressure sensitivity as well as foot pedals, mod wheels, pitch-benders and even breath control and assignable MIDI parameters. So don't say that synths have no feel. It's the people (I can't call them musicians) who quite simply cannot play them. These people can make everything sound well groovy by using step-time entry or quantising to the nth degree, but take away their computers and ask them to actually play and their so-called musical skills seem somewhat suspect. As Tim Goodyer said in his February Comment: "What's happened to the keyboard heroes?".

Well, according to Baf and Wendy Munro (Communique, May '88) they lie in the form of the Jellybeans, Dakeynes and so forth of this 120bpm world. Somehow I think not. Yes, Wendy, the music they make is relevant to the late '80s, but that's all. I don't think we'll see too much of these individuals in the future. I'm also knocked out by Baf's notion that "to really make a floor move" is his idea of job satisfaction. If seeing a pile of Sharons boogieing round their handbags is your idea of heaven, then little things obviously please little minds. No, without wishing to disappoint fans of this current pop trend, this music is the '80s equivalent of Gary Glitter and the Sweet: shallow and gimmicky.

On the other hand, some keyboard heroes of old are still alive and kicking – Chick Corea instantly springs to mind. His last album is entirely instrumental, very powerful, seriously funky and impeccably played. Then we have the last Stevie Wonder album, the recent Spiro Gyra album, recent vinyl from Toto, the last Steps Ahead album, the new Brecker waxing, the latest Sting album, Peter Gabriel's album . . . I could go on. These records show us just how technology can be used in the hands of people who can actually play.

At this point, Ms Munro and Baf and all the others will no doubt cry out "boring old farts". But if this is the case, why is it that all these musicians sell out concert halls whenever they tour, and why is it that some of them have actually been in the business for over 20 years? Because they can play, and through that they can make better music, music created from the heart and not the wallet.

So, with the evidence seemingly stacked up that being able to play actually allows us to create more interesting music, why aren't people learning to play their instruments these days? Part of the problem lies in the fact that today's role models are highly successful but vacuous, empty-headed turkeys whose idea of making a record is to s-s-s-sample someone else's and lay the samples over a TR808 beat, and who need to use computers for every single aspect of music-making. What incentive is there for today's musicians to actually master their instruments when their peers are about as creative as Ronald Reagan's haircut? Using technology is an easy option. Sooner or later, though, it will backfire in their faces when they realise that they cannot progress musically because of their sheer lack of ability and talent.

You see, technology is only a tool, and can only be as good as the people using it. In the same way as having a word processor doesn't make you into an author with a real ability to tell a good story, having a sequencer doesn't make you a musician. Certain basic skills have to be learnt first.

As I see it, the new musos are like learner drivers who have just discovered how to switch the engine on. Until they learn how to use the clutch and the gears, how to steer, how to accelerate and how to brake, they will be left motionless with the engine ticking over until they run out of petrol.

So what's the solution? Simple: learn to play. *It's not easy, nothing is, but I'll tell you what: it's easier to learn to play a few scales and get a bit of technique together than it is to figure out some new-fangled sequencer, or to fathom out why one synth isn't receiving MIDI or why the drum machine is lagging behind the sync code. Pay attention to Don Airey's wise words from the February issue of MT and get out there in a band and learn to play through communicating with other musicians.*

Fact: all the guys I know who can play well still play with other musicians, and all the people I know who have the playing technique of an arthritic budgie (of which there are many) just sit at home playing with themselves. I rest my case.

■ John Gambold
Faversham
Kent

Dear MT

Leading The Way

"Well done" for an entertaining and informative magazine. Just a short note to bring to light a potentially serious technological problem. I have a Korg synth that uses a two-pin mains lead. Ever tried to get hold of such a lead? Most music shops have had so many enquiries for them that they could afford to retire in luxury – if only they could get hold of the elusive animal (otherwise known as "that damn thing"!).

Imagine being set up on stage, or in an expensive studio, only to discover that the lead has been left behind – or, worse still, lost. With a normal three-pin socket, the chances are that a spare lead will be to hand, or a nearby shop will stock them. But a two-pin? No chance.

What were Korg thinking about? Were they thinking? Why be so bloody awkward?

■ Richard J Cuthbert (Mr Angry)
Sheffield

Dear MT

Sampled to Death

letter of the month

Leafing through some back issues of MT recently I found myself re-reading the interview with Stock, Aitken and Waterman (MT June '87). What a pity it was done before 'Roadblock' and the whole M/A/R/R/S fiasco – I would have loved to hear them justifying their deplorable attitudes within the context of an MT interview. Perhaps you should run them to ground again.

The terrible trio claim that plagiarism and sampling are not the same thing. They're right. Sampling is more honest: at least the original is present for all to hear, whereas plagiarism tries to obscure its sources. Everyone knows that M/A/R/R/S sampled a bit of 'Roadblock', but how many people know that the rhythm track of 'Roadblock' specifically plagiarises a popular rap record of '87, the Classical Two's 'Rap's New Generation'? Quite ironic, really. What's more, 'Roadblock' ripped off the "rare groove" scene, which itself grew out of hip hop's obsession with '70s music. Double plagiarism.

In contrast, the fact that M/A/R/R/S sampled bits off loads of records (including 'Roadblock') for 'Pump Up The Volume' didn't stop the track from saying something new, and it has been far more influential than Stock, Aitken and Waterman can ever hope to be. Which just goes to show, boys, that there's a lot more creative potential in sampling than there is in plagiarism.

Unfortunately, potential is the key word. For while M/A/R/R/S and the Coldcut crew manage to be genuinely creative, the current crop of sample-crazy records by opportunists who've spotted a fast buck in the making do nothing but harm to the cause of sampling. The problem as I see it is that sampling is too readily effective at a superficial level for its own good. It's a musical technique which needs to be mastered like any other, and to master it you need to be musical. Just because someone can play records for other people doesn't automatically mean they should be making their own.

The ultimate irony is that a lot of sampling records nowadays are plagiarising one another by using the same samples (I've lost track of how many times "This is a journey into sound" has been used since Coldcut made it a cool sample).

Down with plagiarism. As Matt Black and Jonathan More (the Coldcut duo) have said, there's a whole world of music out there to dip into and re-interpret. Sampling is a creative musical tool. Let's start using it creatively.

■ **Joe Esterhaas**
Fairlop
London

Dear MT

Snookered

I've been spurred to write to MT in the hope of restoring some sanity to the letters page. I mean, what is all this talk of real and unreal musicians? There's no such thing as a real musician, only good and bad musicians.

The trouble with people like John Young is that they're all too ready to assume someone is a good musician, and the music they make is good music, just because they have great technical proficiency on their instrument. That's utter bollox, matey.

I think Mr Young gave the game away when he wished that music could be like a game of snooker. I mean, if we all tried to be like Steve Davis then music would be pretty soulless, wouldn't it (come to think of it, that's what happened to jazz-rock in the late '70s). The man's got phenomenal technique and he can win a snooker tournament with it, but music just ain't like that.

In case you think I'm anti-heroes, let me say right now that I have my own keyboard heroes, musicians who inspire me through the sheer genius of their creativity. They all have phenomenal technique, but it's placed in the service of musical inspiration, not tired and uninspired reworkings of musical ideas which were old hat ten years ago. Yet I doubt John Young would even give them the time of day.

I'd better lay my cards on the table. The keyboard players I look up to most are Joe Zawinul, Herbie Hancock, Cecil Taylor and Marilyn Crispell. "And who?", I hear everyone saying.

Zawinul and Hancock have been using the products of music technology since the '60s (let's not forget that the electric piano was quite a revolutionary instrument once). Zawinul in particular has a unique vision of the place of technology in music; no-one else has managed to make the synthesiser such an organic instrument. His music rubbishes all over people who blame everything that's wrong in music on the technology. It's people who make everything wrong, not technology.

Cecil Taylor is not only a most phenomenal technician of the piano, he has been pursuing a unique musical vision for the past few decades. Marilyn Crispell is also a musician who refuses to compromise on her musical inspiration, and for her pains she's all but penniless (Wire magazine ran an interview with her recently, if anyone's interested).

Now, I guess Taylor and Crispell are outside MT's brief, but Hancock and Zawinul are prime MT material – yet I've never come across an interview with either of them in MT (or E&MM). Surely these guys deserve exposure in a magazine like MT, alongside the likes of Jellybean and Yes.

You see, I don't believe that mass popularity automatically equates with either musical quality or musical innovation. So what if bands like Yes, Genesis and Pink Floyd can still draw large audiences and sell lots of records? They're all part of the nostalgia industry, anyway.

In case you've marked me down as a musical elitist, let me say that I don't believe obscurity is any measure of excellence either. All that really matters is the creativity.

■ **Chris Frost**
St Ives

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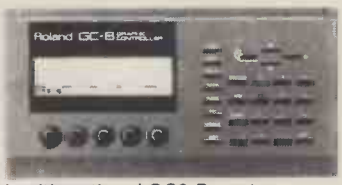

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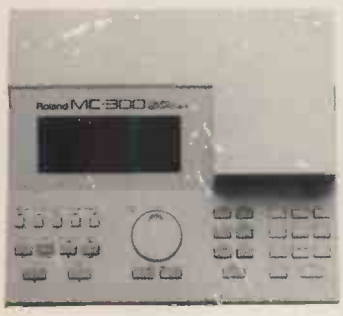

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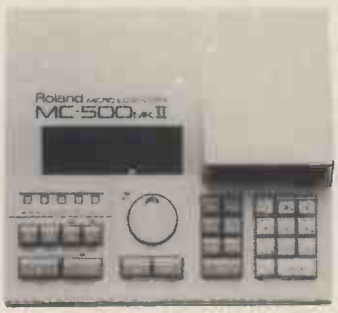

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INTERFACE

Your questions answered by MUSIC TECHNOLOGY's resident team of experts. If you have a query about any aspect of music technology, or some information that might be useful to other readers, write to Interface at the new editorial address, and include your address and day-time phone number.

Q *There seem to be several upgrades on the market for the DX7 and variants. Are there any for the TX7? A multitimbral TX7 in my setup would be ideal, as it would save me from having to buy an MT32.*

■ **Anne Downes**
Southampton

A *I'm afraid you're asking a bit too much of the old TX7. The instrument's internal architecture doesn't allow for multitimbral operation, nor does that of the DX7 Mkl (on which the TX7 is based). This is why even Grey Matter Response, originators of the celebrated E!Boards, weren't able to make the DX7 Mkl multitimbral. However, they were able to bring multitimbrality to the DX7II, which raises the much-loved question of why the instrument wasn't multitimbral in the first place.*

Returning to the TX7, there probably wouldn't be room inside the instrument's casing for an add-on board anyway. As far as we're aware (and as far as Yamaha are aware, too) there are no upgrades of any sort for the TX7.

If you want a multitimbral FM expander then your best bet is Yamaha's TX81Z. However, if you're considering the MT32 then you should also check out the new Kawai KIM (you'll find a review of the KI synth version elsewhere in this issue). ■ *St*

Q *I am considering upgrading my computer from a Commodore 64 to an Atari ST, but am uncertain about one thing: can you run the sophisticated software packages (such as Steinberg or C-Lab) on a 520ST, or are they confined to the more powerful 1040?*

Also, I'm thinking of buying a second-hand E-mu Drumulator. Does the Drumulator have MIDI ports (and if not is it still worth buying?).

Any answers would be much appreciated.

■ **Chris Wareham**
Farnborough
Hants

A *I'll take your second question first, as the answer is blissfully short. Basically, there's been a MIDI retrofit available for the Drumulator in the past, and there will be one available again soon, but there isn't one at the moment. Make sense of that if you can. Moreover, there's no price yet for the proposed retrofit. If you want to keep tabs on the situation then give E-mu distributor Roy Goudy a call on (0875) 813330.*

The Drumulator has the inherent merit of many American drum machines that you can decide on the choice and combination of drum sounds by plugging in different sound chips. Many drum machines have passed under the proverbial bridge since then, and many of them prefer a fixed set of sounds to the Drumulator's sonic open-endedness. E-mu's drum machine is going for a good (cheap) price nowadays, and if you fancy the idea of a drum machine with plenty of "oomph" plus individual audio outs and a good range of sounds then the Drumulator may well be worth its current second-hand asking price of around £200.

Now to your first question. The latest version Pro24 software (V3.0) won't run on a 520ST, but should you get a 520 and subsequently upgrade its memory, you'll be able to buy Pro24 on single-sided disk (the 520 has a built-in single-sided disk drive as opposed to the 1040's double-sided).

C-Lab's Creator will run on a 520ST (8500 notes available), though their Notator interactive sequencer/scorewriter package won't. Other sequencers which will run on a 520ST are System Exclusive's Iconix (30,000 notes), Hybrid Arts' MIDItrack series of sequencers (SMPTEtrack, SyncTrack and the new EditTrack – all 4-5000 notes), Dr T's KCS Level II (20,000 notes) and Passport's MasterTracks Pro (40,000 notes).

You might also like to consider the more sophisticated of the cheaper sequencers, which offer greater storage capacity because of their scaled-down facilities – for instance, Hybrid Arts' new EZ-Track Plus (17-19,000 notes) and Passport's MasterTracks Junior (60,000 notes).

All these figures are necessarily approximations, of course. You should bear in mind that note storage is relative to the amount of performance data (such as pitch-bend, aftertouch and modulation) that you're using.

Syndromic Music in London's Muswell Hill (Tel: 01-444 9126) are an official Atari Service Centre and can do memory upgrades to one, two, four and even 12 megabytes using boards of their own design (the one meg upgrade costs £170 including VAT and fitting),

while the Silica Shop in Tottenham Court Road (Tel: 01-580 4839) do a one meg upgrade (£149 including VAT and fitting). However, neither company are able to offer upgrades at present due to the current worldwide shortage of memory chips – a fact which you may like to bear in mind when deciding whether to go for a 520 or 1040.

Finally, for a more detailed discussion of the 520/1040 question, refer back to November '87's Interface. ■ St

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Q **Please help me. I'm slowly turning into a "MIDIac". Drum machines, sequencers, expanders, FSK, SMPTE, ITV . . . It's driving me mad. Whatever happened to "proper" names for synths like Odyssey, Jupiter and Prophet? What we seem to get nowadays is a mind-numbing collection of letters and numbers which sound like algebraic formulae.**

But enough of this. I really would appreciate some help. I own an Atari ST plus a very basic sequencing package, a Casio CZ1000, Yamaha FB01, Roland TR505 and Tascam Porta 05. Could you recommend a good cheap (less than £100) and easy-to-use step-time sequencer program for the 520ST? I find the TR505 method of step-time programming easy to use, and a program that used a similar bar/step system would suit me fine. There seem to be plenty of real-time, tape-recorder-style programs around, but as my playing skills aren't exactly fantastic, and I want to create tight electro-pop, I thought step-time seemed the best option for me. Surely a computer which can handle fantastic real-time programs such as Pro24 could handle a simple step-time sequencer program?

■ Alan Watkins
Belfast

A How're you doing, AW? Not too good, huh? What I want to know is this: have you christened your instruments? I mean, do you call your TR505 "Sally", or your FB01 "Roger"? We should be told.

What really gets me is the numbers. At least you can have fun working out meanings (feasible or otherwise) for the letters, but how do manufacturers arrive at all these numbers?

But enough of this (to coin a phrase). If you're a fan of the TR505's approach, I suggest you investigate Bit by Bit Software's MIDIdrummer software for the ST (reviewed in MT, February '88). Essentially this allows you to program rhythm patterns into a pattern-based grid displayed on the Atari's screen. You can create up to 100 patterns, and organise these into eight songs each of which can consist of up to 1024 steps. A pattern can contain up to 16 "rhythm lines", each of which can be assigned its own MIDI transmit channel and MIDI pitch. So although MIDIdrummer is intended for rhythm programming, it's possible to incorporate basslines and simple melodic or chordal material. The software is available for the modest price of £39.95, and you can contact Bit by Bit Software on (0522) 40205.

If you're looking for a more comprehensive step-time sequencer then you'll have to consider the sophisticated real-time sequencers which also have grid-based step input and editing. We're talking Steinberg's Pro24, System Exclusive's Iconix, Passport's MasterTracks Pro and Hybrid Arts' MIDItrack series of sequencers. The cheapest option would seem to be Hybrid Arts' EditTrack (which in fact won't be available until the end of June). This will cost £179.95, and is essentially the same software as the company's SMPTEtrack and SyncTrack sequencers but without the add-on sync boxes. Syndromic Music (Hybrid Arts' UK distributors) can be contacted on 01-444 9126.

There does seem to be a gap in the market-place for a comprehensive step-time sequencer costing under £100. Whether or not the software companies feel the gap is big enough to warrant them trying to fill it is a different matter. ■ St

---

Q **I am the owner of an Atari/Super Conductor-based MIDI system which runs, among other things, a Yamaha FB01. Although I'm reasonably happy with the percussive voices, I find the absence of any swirling, analogue-type string and brass sounds a serious drawback. Is this an inherent fault of FM synthesis, or just thoughtless programming by the manufacturer? Assuming the latter to be the case, I am, it seems, left with three alternatives: 1) purchase some relatively expensive editing software (which of course will only be of use for the FB01) and spend many a happy/frustrated hour trying to produce respectable sounds; 2) find a public domain or commercial librarian package and hope that someone else has managed to produce some reasonable sounds, or 3) use the money I save from not buying software for the FB01 to purchase a second-hand analogue MIDI synth (which of course would also expand the number of voices available to me at any one time).**

What do you say?

■ SR Guy
Eastleigh
Hants

A I say lots of things at this time of the month, not all of them worth repeating. I suspect I've just said another.

As far as I know there are only two FB01 editor/librarian packages available for the ST, from Steinberg and Dr T's (costing £113.85 including VAT and £99 including VAT respectively). The Steinberg software is for the FB01 only, and doesn't come with any sounds. However, Dr T's Four-Op Deluxe is a generic editing program for Yamaha four-operator instruments (FB01, TX81Z, DX100, DX27, DX21 and DX11) and comes with 25 banks of sounds which can be loaded into all these instruments – obviously a highly useful program to have if you plan to upgrade to, say, a TX81Z or DX11 at a later date.

If you're looking to find fault, then it's probably a combination of the two causes you suggest – FM is capable of producing a better set of sounds than those which come with the FB01, but at the same time you shouldn't expect everything from any one synthesis system. In the long run you might be better off using the FB01 for its particular strengths, and scouting around for another instrument to complement it. There are plenty of fine and reasonably cheap analogue (or at least analogue-sounding) synths on the second-hand market at present. Check out, for instance, Korg's DW6000, Oberheim's Matrix 6, or Roland synths such as the Juno 106 and JX3P.

Among new instruments, you should check out Kawai's K1M synth expander (the companion K1 synth is reviewed elsewhere in this issue), the forthcoming Oberheim Matrix 1000 expander (it's not multitimbral, but you do get 1000 of those rich analogue sounds which justly made the Matrix synths famous), and Cheetah's forthcoming MS6 synth expander. ■ St

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Q **I am writing to you in the hope that someone out there in MT-land may be able to assist me in my project to build a Theremin. Yes, a Theremin. The only information I have ever been able to find on how to build one was when I recently came across an old issue of E&MM (November '84) which includes a Theremin circuit diagram by Paul Balfour. However, there are no values given for the capacitors, resistors and other components. As my knowledge of electronics is quite basic, I need a lot more detailed information on how to go about gathering together all the bits and pieces I will need to build my Theremin.**

I would be much obliged if anyone could help me in any way, either by referring me to some kit, book or other publication offering step-by-step instructions on how to build a Theremin. It's very difficult to find people who have even heard of a Theremin, let alone know how to build one. I've never met anyone who owns one or plays one, but I have heard them being used on records and sci-fi soundtracks, and I'm positively haunted by the desire to bring them back from the dead zone of electronic music.

Yours sincerely in hope and trepidation that I am not once again coming up against a dead-end in my endless search to fulfill my dream project.

■ Elizabeth O'Toole
Dublin

A Oh dear, our past sins are catching up on us – lucky I've been around long enough to remember them all . . . The Theremin project was printed as part of the "Short Circuit" series of readers' own electronic circuits, which were generally published un-tested – so you take your life in your hands if you choose to build one! While we were dependent on the depth of instructions supplied by the designer, this particular project was published minus the parts list (cringe). Two issues later (January '85, page 64), and the case of the missing parts list was finally solved. A copy is on its way to you, though you may need to collar a friendly, more experienced electro-whiz to interpret the circuit for you. (Other readers who missed the January '85 issue can obtain a copy of the parts list by sending a stamped addressed envelope to the editorial address.) ■ Tmcg

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MT 6/88

YAMAHA WX7
Wind Controller

The days when "blowin'" referred exclusively to wind instruments is long gone; the days when "blowin'" referred affectionately to a band in full-flight are over – now you can go hi-tech "blowin'". Text by Andy Blake.

IT WOULD BE fair to say that Yamaha had a head start in the wind control stakes. Breath control, which appeared circa 1983 on the humble CS01, has always been available on the DX7 and its offshoots. The original Yamaha breath controller is a sawn-off melodica: a simple mouthpiece, built into a small piece of shaped plastic. Plugged into a DX, it can control the contours of any appropriately programmed sound. There are drawbacks. It looks a bit silly in performance; its design encourages hyper-ventilation (temporary oxygen poisoning and faintness) and anyway, the mouth-hand coordination required is tricky to learn. The WX7, which has been on the shelves of your friendly local hi-tech dealer for some time now, has been tailor-made to exploit the breath-control facility already available on the DXs, but in a far more user-friendly and versatile form.

The WX7 was developed by New York woodwind session musician Sal Gallina (interviewed in MT, December 1987). Like Akai's EWI/EVI, it is essentially a monophonic wind instrument. Sound is produced by blowing a channel of air, directed by a mouthpiece, against a transducer; modulation and pitch-bend can be controlled by lip pressure acting against a flexible metal bar. Keys based on saxophone fingering produce the chromatic scale, and a series of thumb buttons control octave transposition – six octaves are always under the thumb. The signals thus generated are transformed by an A/D converter and passed from the instrument itself to a small battery-powered booster, which sends MIDI information.

Style and Setup

UNWRAPPING THE INSTRUMENT is a real birthday treat. The package has been well-designed and *looks* like a serious instrument right from the start. A lightweight carrying case opens to reveal the WX7 itself, a sax-type mouthpiece complete with a plastic "reed" attached to two oblong sections: a control housing and a slimmer unit containing the keywork. On top of this are keys set out in the standard woodwind Boëhm system, and underneath are octave switches for the left thumb, sling-hook, and three switches for the right thumb. One (a rocker) controls pitch-bend, one sends program changes, and the third sets up the Hold facility, which we'll discuss later. Then there are various accessories: the battery pack, with leather belt wallet plus six AA batteries, two leads to connect this with the WX, a MIDI lead, a sling, a spare mouthpiece, and a polishing cloth. A small package contains shims to adjust the riding height of the keys, and taps to block the air hole Yamaha have thoughtfully provided to clear spit – blocking this produces a more resistant, tighter feel. Each purchaser of the WX7 receives, along with the users manual, a copy of Sal Gallina's book and demo cassette, *Expressive FM Applications*, which shows what you can do with a WX7, a TX81Z or DX7, and one or two effects units, and lists all the presets you hear on the tape.

There is also a small screwdriver, in a box designed to clip onto the instrument lead, which is necessary to make the WX behave in the way you want it to. User-friendliness really has been built in. Open a flap on the underneath of the instrument, and you'll see four rotary pots and eight DIP switches, with which you can adjust its responses to suit your own playing style – and this doesn't have to have anything to do with saxophone technique.

Don't let the appearance of the mouthpiece put you off – the plastic "reed" is there to be used if you want it; if you don't, you can play it like a recorder. This is called the Loose Lip playing style. The reed can still be used for pitch-bend up, but you can disable this if you wish and give that right thumb some work. Then there is the Tight Lip playing style. In this mode, the reed is clamped to the mouthpiece while blowing, much as with a sax or clarinet. Relaxing or tightening gives pitch-bend. With each playing style, vibrating the reed will give modulation, unless you disable this. Two of the rotary pots allow you to adjust the threshold at which breath causes notes to speak, and the amount of Gain in volume changes in wind pressure will produce. The other two pots provide for adjustment of the instrument's sensitivity to lip pressure. The DIP switches allow you to choose between the transmission of aftertouch and breath control; to disable volume information; to transpose the instrument up an octave, or into B flat or E flat, should you wish to read band parts; to select either linear or exponential response to breath pressure, and to switch between Tight and Loose playing modes.

The DIP switches also allow you to select one of four versions of Key-hold mode, which as you can see deserves a paragraph to itself. In each instance, pressing the Hold key while playing a note will cause that note to continue. In Normal Key-hold mode, the hold you've initiated remains at the same pitch. You can play anything else meanwhile, but the drone will only disappear (except during pauses for breath) when you press the Hold key again. Follow Key-hold mode works out the interval between the note you pressed Hold on and the next note, and then plays parallel chords of that interval until, again, you tell it to stop by clicking Hold. Now it begins to get clever. In "Dual-play (no breath)" mode, the WX transmits the drone you've selected on a separate MIDI channel, and sustains it, independently of breath pressure, until disabled. At last – your chance to play the music of the bagpipes without learning the basics of octopus-wrestling. Finally, "Dual-play (use breath)" mode, enables you to play parallel lines using two MIDI channels. The possibilities are ably and impressively demonstrated on the Gallina cassette.

A *Perfect Partnership?*

THAT'S ALL VERY well, but in order to play the WX7 you've got to plug it into something. Sal Gallina's book details a dozen patches for the TX81Z, which he used (with a REV7 and an SPX90) at last year's British Music Fair – to quite staggering effect. Hardened professional musicians were heard to utter words of appreciation. A good few were later seen emerging from music shops with WX and TX boxes. Needless to say, Yamaha recommend the use of a TX81Z, and will gladly sell this with the WX as a package. And a very worthwhile partnership it is. The TX81Z, as no doubt everyone knows by now, is an inexpensive rack unit which has breath control, and is sonically versatile. The first DX/TX to feature seven "waveforms" as well as eight (four-operator) FM algorithms, it offers two performance modes. Single Play mode provides 128 preset and 32 user-programmable memories, while the 24 performance presets give the possibility of combining these available voices. Up to eight can be used monophonically. This fits very well with the proclivities of the wind controller. You can, for instance, set up the equivalent of keyboard splits: say a bass sound to cover the lowest two octaves, a clarinet sound for the middle two, and a flute sound for the two highest. Or you can just pile sounds on top of each other, adding if you will, the TX's pseudo-reverb or delay effects, to produce rich and strange lead sounds. This TX also offers 10 preset and two user programmable microtonal scales – so you can play non-European music without constant pitch-bend ►

► adjustments. All in all, as I say, the partnership works extremely well. Of course, there remain problems with the TX81Z. Its tiny user memory is probably the most important. It is also extremely time-consuming to program (see review in MT, July 1987). And of course the WX7 works perfectly well with other synths and samplers.

In Performance

ASSUMING FOR THE moment that you're using the TX81Z, with sounds carefully programmed to exploit breath control to the full, how does the WX7 behave as a MIDI controller? Most importantly, does it provide that warmth of human expression which FM synthesis so often lacks – does breath control actually *breathe*?

Well, yes, actually. Careful setting of EG Bias sensitivity and Key Velocity sensitivity, as well as the Breath control settings (Pitch Bias, Pitch Modulation, Amplitude Modulation, and EG bias) enables you to take synth playing in new directions, opening or closing components of the sounds you've programmed in ways you'd find impossible using a keyboard. The breath control system doesn't quite offer the massive flexibility of Akai's EWI/EWV combination, but the WX phrases like a wind instrument, and it also *feels* like one, with its responsive mouthpiece and well-designed key action. The wide range of adjustment available means that it should suit any playing style. Non-Yamaha synths and samplers respond equally enthusiastically to the WX's promptings: if you don't like FM, you don't have to use it. All in all, it should be another step in Yamaha's plan for world musical domination.

But it isn't perfect. The octave mechanism in particular is a problem. The octave buttons don't share the smooth action of the pitch keys. Furthermore, they are not ideally spaced: smooth movement between octaves is achieved more by luck than judgement. The pitch keys themselves, well designed as they are, are made of lightweight plastic; they wouldn't inspire great confidence in anyone setting out on a three-month tour of the Americas. I feel something more sturdy is required.

Verdict

A GREAT DEAL of care has gone into the design of this instrument. Sal Gallina's demonstration book and cassette give purchasers a start in the creation of expressive and impressive sounds. Though the instrument is suitable for anyone to learn quickly, it is well-suited to existing wind techniques – unsurprisingly, many reed players have already taken to it, and more will surely do so. No doubt improvements to the octave mechanism are in hand – there are rumours of a second version, due perhaps this time next year. What we already have, however, is enough to make anyone thinking of taking up a wind controller stop thinking – and start playing. ■

Price *WX7 £749; TX81Z £449. Both prices include VAT.*
More from *Yamaha, Mount Avenue, Bletchley, Milton Keynes, Bucks MK1 1JE. Tel: (0908) 71771*

Photography *Rose Rounseville*

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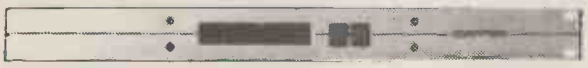

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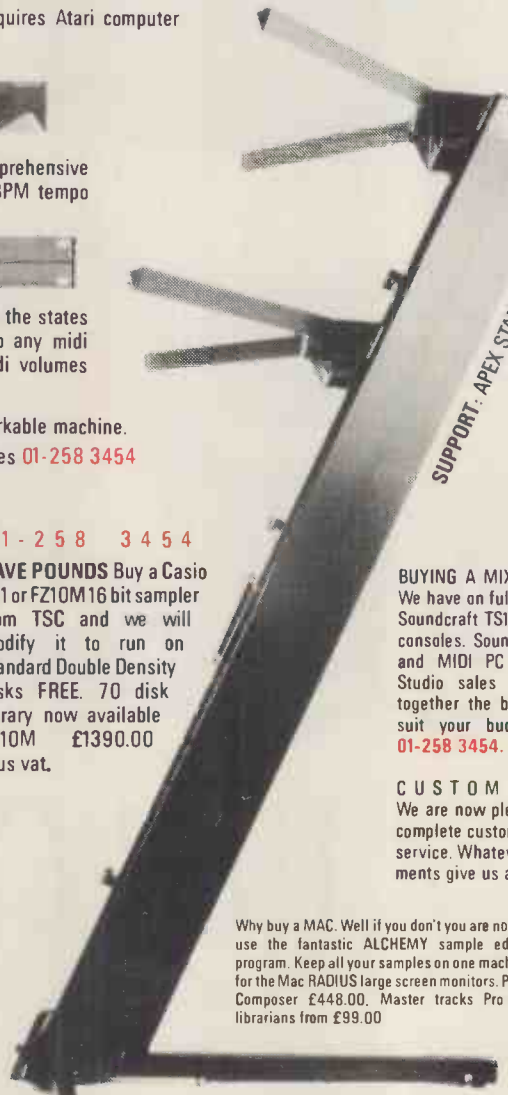

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compliled from a survey of customer enquiries

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Illustration *Sophie Lawrence-Jones*

A Vocal Chord

PART TWO

With the raw vocal material safely on tape, a stunning set of vocal samples is just one operation away: transferring the voice to the sampler. *Text by Tom McLaughlin.*

LAST MONTH I recommended recording every semitone within your vocalist's range while singing both ascending and descending semitone scales. With good reason too. After giving your recordings a rest and listening to them with a fresh set of ears you'll find that some notes sound infinitely better than others. Maybe some are more in tune or have a more consistent coloration. Maybe the higher register of the descending scale sounds less strained than the ascending scale. Whatever the reason, some notes will shine brighter than the rest.

List the pitches you recorded and, while listening to a rough mix of your recorded voices, note the takes that sound best to your ears. These are the ones you'll want to consider for use in your multisample.

To avoid sampling every one of these "superior" takes (even samplers at the upper end of the market have a limited amount of memory space), you'll need to whittle the intervals between the takes you're going to use down to maybe every second, major/minor third or perfect fourth. Keep an ear out for consistency in tone colour from one selected take to another, paying special attention to the transition area between your vocalist's chest and falsetto registers.

Mixing for Sampling

THIS IS VERY similar to audio mixing. If you're going to be sampling in mono, and I'll assume that you are, be sure to monitor your recordings in mono, so you'll get a good idea of what's going to end up in your sampler. If your sampler has a monitor output, by all means monitor your recordings using that.

Route your multitrack tape recorder's outputs through individual channels of a mixer, equalisation set "flat" with no effects, and start playing your vocal recordings from the beginning of the tape. Listen to the first vocal track and while the tape is running, bring up the level of the second track until a good balance between the two is obtained. For an homogenous ensemble mix, repeat this with the other tracks so that no one track predominates.

EQ & FX

QUITE A LOT can be done with equalisation. It all comes down to personal taste, but with EQ you can manipulate vocals to make them sound close in or far away, full or airy, subtle and sexy or tinny and thin. It's conceivable that several sets of vocal samples can be obtained from one set of recordings, just by using different EQ settings.

When pushing the top end of your recordings with EQ, or cranking up the

"drive" on your psycho-acoustic enhancer (aural exciter) to bring out clarity or breathiness, it's a good idea to put a low-pass filter between the mixer and sampler set to let frequencies through just below half your sampling rate. This way you can do whatever you want to the top end, while preventing any possibility of aliasing.

If you hadn't used any reverb while recording your vocals and feel the need for some "space" around them, now's the time to add it. A good vocal plate or hall setting, with a little top and bottom end rolled off, will make your samples sound more lush and professional. If you put a different room around each vocal pass while recording to add an individual character to each track, routing them all through the same room now will help to homogenise the lot.

Sampling

NOW TO THE serious sampling stuff. Make sure you have enough formatted disks to hand. You'll need at least three for the work ahead of you; one for storing your unedited source samples, a working disk, and one to save your edited and manipulated samples to. Once you've arrived at the final versions of your samples, the working disks can be erased and used for another project. Make sure to name each of your samples according to pitch, octave and whether it's from the ascending or descending scale. This is not only for keeping track of them while editing and looping them but will make life a lot easier when mapping time comes.

Your job of sample editing, looping and manipulation will be made infinitely easier and less time-consuming with some sort of visual editing. Forgetting all the fancy facilities, just being able to see the waveform you're working on will cut finding acceptable loop beginning and end points down from possible hours to probable minutes.

Be careful with input level when sampling vocal ensembles. Monitoring peaks on tape recorder VU meters and sampler input meters can be rather deceptive. As with other ensembles, there will be wide variations in level along the length of a note due to the different vocalists hovering around the central pitch (visually displayed, vocal ensembles often look like some sort of roller-coaster ride), so it's easy to run into digital clipping on the peaks. Unlike many percussive sounds, where a slight amount can be used to your advantage, digital clipping sounds really ugly on sustained samples, so err on the side of too little input level to be safe.

Sampling Rates

THE SAMPLING RATE(S) will be governed by the available rates on your sampling unit, the amount of memory space available on your sampler, how many edited samples you expect to fit into that amount of memory space and the amount of top end and fidelity you require.

It's widely accepted that a playback frequency response of 3-4kHz is the bare minimum needed to sample intelligible speech. Since you're working on samples that will hopefully be more musical than I Speak Your Weight scales, you'll want to work with sample rates considerably higher than this.

From my experience, you'll need a minimum playback bandwidth of 8-10kHz. If you can afford the memory space, by all means sample at full bandwidth, but for the sake of economy, a good compromise seems to be in the 12-14kHz range or 15-16kHz if you're sampling exceedingly breathy vocal samples.

Take time to experiment with a few different sampling rates to see what you can get away with, and let your ears be the judge. Low-pitched samples can often be sampled at lower rates with little or no apparent loss in fidelity. To calculate a sampling rate, take your desired playback frequency response, multiply it by two and add roughly 10%.

Sample Lengths

LET'S ASSUME YOU'RE working on a set of oohs, aahs, humming and so on, so you'll want to sample as long a piece of vocal material as is practical. It's not uncommon when I'm working on a set of vocal or string samples, to fill up three or four entire floppy disks with raw material. Once fully edited, these samples might take up anywhere from 75% down to as little as 15% of the original memory space.

Trimming and Looping

BEFORE YOU START looping you'll probably want to trim some of the beginning off of your oohs or aahs. Unless you like your samples "au naturel", you can make your vocalist(s) sound a lot more polished if you fade in after any harsh or "out-of-tune" portions have passed.

Aahs are notorious for having rather rough attacks and virtually all of your takes will start out flat or sharp of the desired pitch. Not having the precision of a key or fret to rely on, we approximate the pitch we're aiming at with our vocal tract before we even open our mouths, and there's always a few milliseconds of fine-tuning that goes on with both pitch and tone colour once we actually start singing.

Although you can use a VCA to fade in harsh attacks, if you play a sample back at progressively lower pitches, the VCA will allow progressively more of the rough portion to pass. With the right software you can digitally fade the sample in and ensure that it has a smooth attack. If you don't have "fade-in" software, but *do* have software for "fading out", simply reverse your sample, fade out, then reverse again to hear the result.

There are several methods of editing and looping vocals. The method you use will depend upon how much time you want to spend, the editing and manipulation facilities available to you and the amount of memory in your sampler. To minimise confusion, adopt some sort of numbering/filing system for your "samples in works" . . . maybe C1a1=C1 ascending, 1st version.

METHOD A is the most straightforward, being not a lot more than sampling common sense, and requires the least amount of time and editing software. Unfortunately it eats up memory space like there's no tomorrow, relying heavily on long loop lengths for its success.

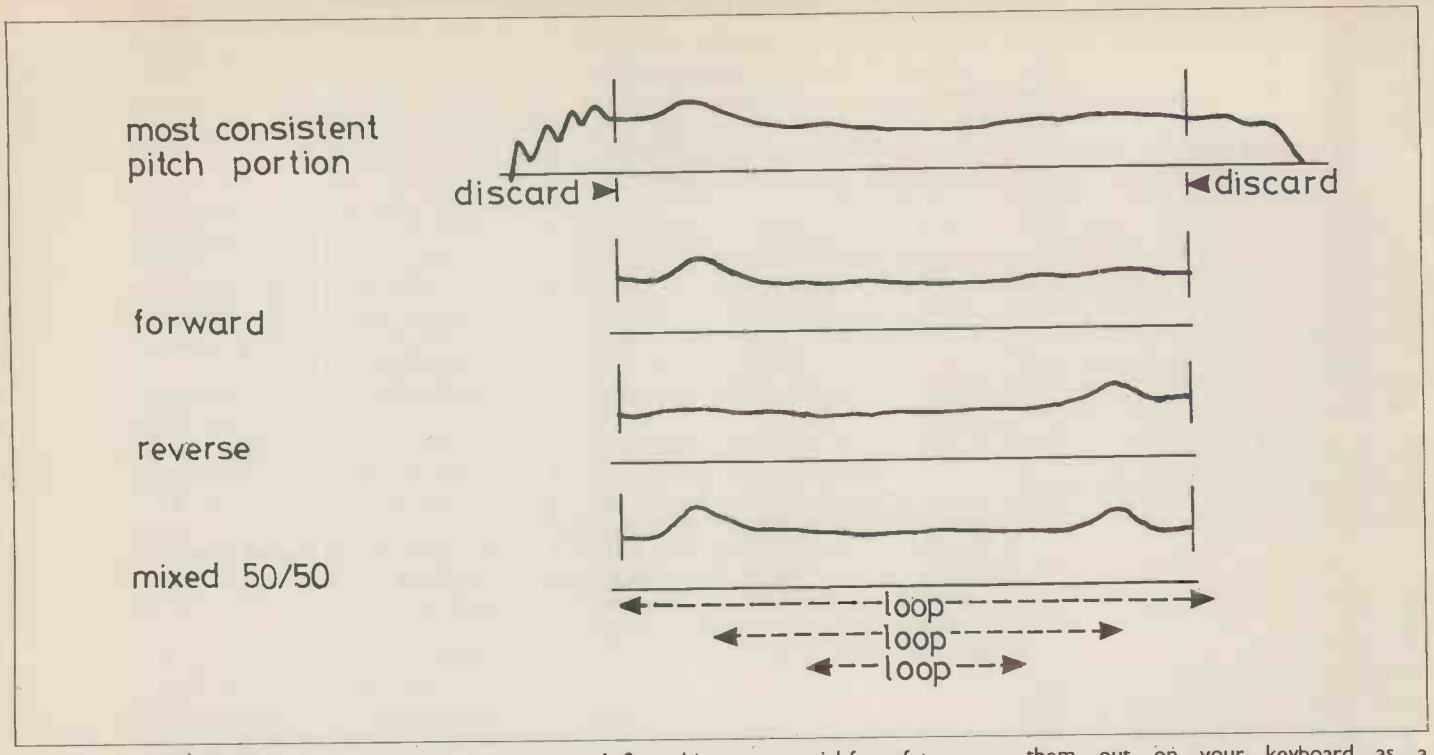
1. Make sure original sample is saved as a backup.
2. Find suitable sample start point.
3. Locate and set passable loop start and end points aiming for as long a loop as possible.
4. If all is well, discard unused sample material and save it. If not, recall backup and repeat 2 and 3.

METHOD B is pretty much the same as Method A with the addition of loop crossfading, merging, blending or whatever your sampler's software calls it. This is what I fall back on if I'm in the middle of a session and a client wants "instant" results. After 3 and before 4 in method A, making sure I have enough sample material after and/or before the loop to meet the requirements of the software I'm working with, I'll calculate and carry out a "loop crossfade" (while keeping my fingers crossed).

"With EQ you can manipulate vocals to make them sound close in or far away, full or airy, subtle and sexy or tinny and thin."

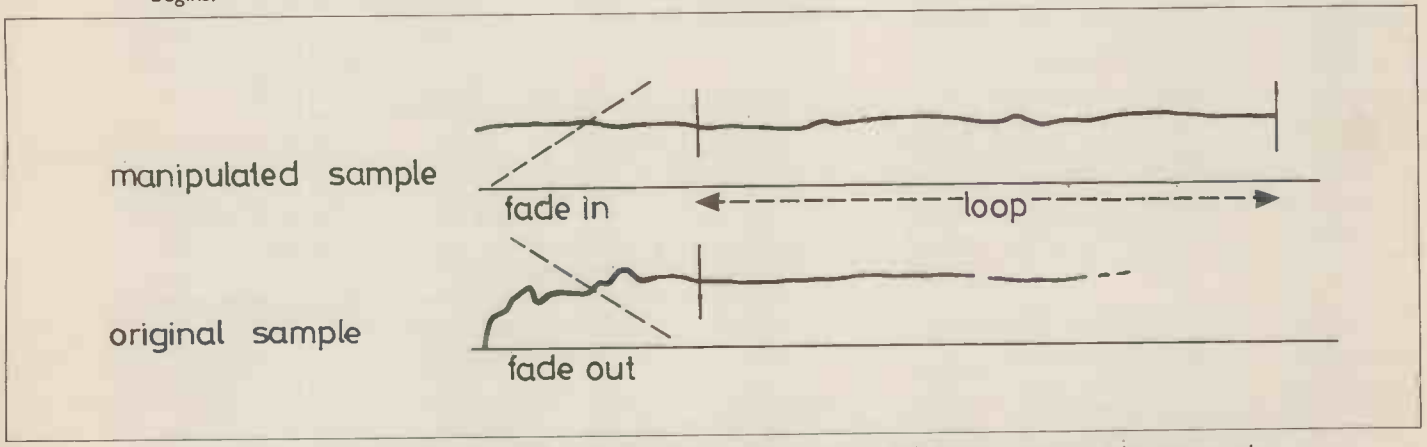
METHOD C uses only the choicest portion of your vocal sample, is an excellent way to cut down on valuable memory space and, depending on the amount of pitch variation along the length of your sample, can also make your ensemble sound twice as large as the original sample. Ideal for sustained vowel sounds, it ignores the attack portion of a vocal sample and relies on VCA manipulation to fade it in. For added realism, automatic pitch-bend (or "warp" as Akai call it) on the way into a note can be employed.

1. Make sure the original sample is saved as a backup.
2. Find portion of sample with the most consistent pitch and coloration.
3. Discard sample material before and after this portion.
4. Save this new material.
5. Reverse this new material and save it.
6. Combine the forwards and backwards versions of the same sample at a 50/50 mix via software, then save.
7. Locate loop start and end points equidistant from the centre of this mixed sample. With sufficient loop-point hunting, you shouldn't need to employ any form of loop crossfading although you may find that alternating loops work more successfully than forward loops with this technique.
8. Discard sample material before and after loop, then save. ▶



METHOD D is the same as above, except that you leave enough un-looped sample material at the beginning to crossfade the attack portion of the original sample through. The advantage of this is that it gives you a more natural entry to your manipulated sample. You must make sure, however, to fade out the attack portion of the original sample before the loop of the looped sample begins.

4. Save this new material for safety.
5. Loop up to 50% of the later part of this material.
6. Discard all material after loop.
7. You want to be left with exactly twice the amount of material in your loop so discard any material in the front portion of your sample that adds up to more than two times loop length.
8. Calculate and execute loop crossfade, save.



METHOD E. If I have the time and enthusiasm this is my favourite method of ensemble sample looping and manipulation. It uses up the least amount of memory space, gives unrivalled loop results and gives your samples a silky smoothness. (This technique alone is worth five times the cover price of the magazine so you'd better appreciate it, you pack of snivelling sample snipers!) The one snag is that it requires a loop crossfade that takes its crossfade material only from before the loop. If you're clever enough, you could probably work it out for other forms of loop "blending" by keeping judicious track of loop and sample positions.

1. Make sure original sample is saved as a backup.
2. Locate smoothest portion of sample with the most consistent pitch and coloration.
3. Discard sample material before and after this portion.
9. Reverse, save and combine with above material.
10. Calculate and execute loop crossfade.
11. Pass GO, collect £200.

As in D, you can crossfade the attack portion of the sample through the first half of this material for a more natural entry or discard the first half, leaving only the loop, to save even more storage space. This process, theoretically, can be repeated on the remaining material, dicarding the first half each successive time, until you are left with a loop only a few wave cycles long epitomising your vowel sound. I've repeated this three or four times on samples with varying degrees of success.

Mapping

ONCE YOU'VE EDITED and looped your samples, the time has come to map them out on your keyboard as a multisample. If you haven't already, assemble all your final versions on the same floppy disk, preferably in order from low to high.

The best place to start mapping is to assign samples to pitches on the keyboard relating to the original sampled pitch. From there it is merely a matter of experimentation to see how far from the original pitch a sample can be taken to meet its adjoining sample.

Samples generally travel downwards better than upwards. If I've sampled every minor third I'll take a sample down two semitones and up one semitone from its original pitch as a starting point.

As mentioned last month, this is where having ascending and descending semitone scales really comes into play. To arrive at the smoothest transition between vocal registers in your multisample, you'll probably have to do a fair bit of "mixing and matching" between your ascending and descending scales, maybe even a bit of back-tracking to your source recordings to fill up any holes in your multisample. (It's a good idea to jot down or make a mental note of your mixing levels, EQ and effects settings for this reason.)

Positional crossfading is a life-saver with awkward transitions between different samples, but really should be used as a last resort. If a sample sticks out of your ▶

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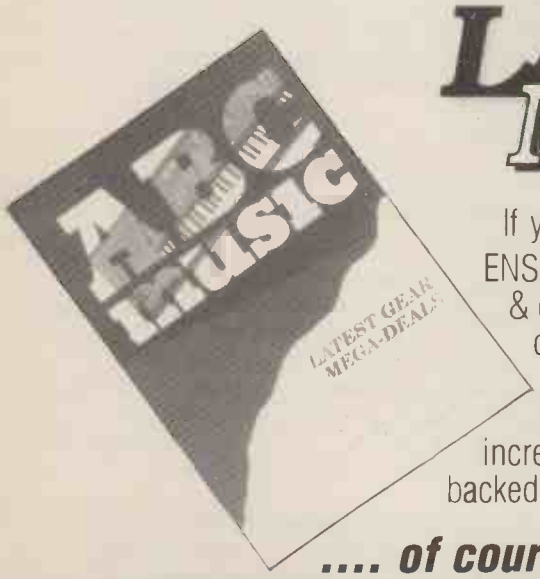

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►multisample like a sore thumb, after a positional crossfade to the samples on either side of it, the sample will stick out like a sore thumb, but with a smoother transition between adjacent samples. It would be wise to sit on that sample for a while and see if you can find a substitute from your source recordings or do without it altogether, extending the adjacent samples further up and down to fill the gap and use a crossfade between them if necessary.

Remember that each positional crossfade uses up two "voices" on your sampler to do its business. Employing extensive positional crossfading to make your keyboard map will smooth things out, but also cuts your keyboard polyphony in half – eight-note polyphony instantly becomes four. Keyboard maps take up relatively little memory space . . . experiment to your ears content.

VCA Envelope Shaping

VCAS ARE YOUR samples' window to the world. You don't hear nothin' if these aren't turned on. Unless you want a percussive entry or have your vocals fade away while a key is held down, we really don't need to worry about the decay control of a standard ADSR envelope (attack, delay, sustain, release). A good starting point for oohs and aahs is to set the attack to about a half-second, sustain up full and the release to suit your taste. The VCA release will be very much like an ambience control on samples recorded with reverb.

Once a suitable envelope has been created, for added realism try making the attack and release times slightly longer, progressively so if you have the patience. You see, not only does it take longer physically and acoustically for lower pitches to be produced and to reach our ears, they also die away at a slightly slower rate to higher pitches.

Vocal Formants

IN THE MARCH issue of MT, we touched upon the subject of vocal formants. To recap; vocal formants are accentuated audio frequency bands that tell our brains what vowel sound we're listening to, what size person is singing and what register is being sung in. No matter which pitch is sung, these accentuated bands stay the same for a given vowel sound. No ifs, ands or buts.

There are two main formants for each vowel sound. For example, the formants for an average adult male:

Oo (as in spook) – *400 and 800Hz*
Aah (father) – *825 and 1200Hz*
Ee (feet) – *375 and 2400Hz*
Womens formants are generally 17% higher, children 25% higher.

To hear vocal formants at work and to demonstrate that they stay fixed for a given vowel, try this little experiment: shape your mouth and vocal tract as if you were to utter a vowel (say, Aah) and whisper this vowel rather than producing a pitch. The effect should be kind of like white noise with the distinct characteristics of the vowel placed upon it. You'll find that there is very little leeway in the placement of your tongue and the shaping of your vocal tract before the unsung vowel starts resembling another vowel.

There comes a point when singing vowels in the extreme upper ranges, especially with females, that these vowels start losing their identity. This is due to the fundamental of the note being higher than the lower formants. Sampling the vowel whispered, with no sign of pitch present, and mixing it in with these can help retain its identity. Whispered vowels can also be mixed with all the members of a multisample to add a breathier quality to them.

Silly Stuff

CERTAIN SONGS HAVE succeeded in sending shivers up my spine using vocal sounds that would be impossible without sampling technology. While some of us go to great pains to ensure that samples sound as natural as possible, in many instances vocal samples played well out of their range sound fantastic; for example, when playing soaring lead lines in songs that ten years ago would have been delegated to the electric guitar. This is healthy not only for its importance in extending the palette of tone colours heard in today's music, it also shows the Doubting Thomases of the music world that sampling can be a lot more creative than merely putting session musicians in the dole queue. "Rules" are meant only as guidelines, so that we don't waste a lot of time making the same mistakes as our predecessors did to achieve acceptable results. Once the reasons for their usage are understood you should choose to use them or not, as your creativity and better judgement dictate.

For the whackos among us, here are some silly things to experiment with for the strange coloration they impart to a voice:

– Sing down a cardboard or plastic tube; it renders speech more sibilant and creates a static flanging effect.
– Sing with your lungs full of helium; it raises the pitch of your voice, and to my knowledge, used in moderation is perfectly harmless (although you may find yourself re-enacting scenes from the Wizard of Oz).
– Sample only the reverbed or effected signal.
– Hum into a balloon, kazoo or piece of cellophane.
– Mix humming and whistling the same pitch at equal levels. This creates a most unsettling, unearthly effect, perfect for film scores.

And while you're at it, don't rule out things like sending the voice through a distortion, octave-divider or other pedal effect, cardboard megaphone, electric bullhorn, telephone, Leslie cabinet if you're looking for new vocal colorations to experiment with. Try a contact mic attached to drums, cymbals, guitar, piano (a brick holding down the sustain pedal), cardboard box, biscuit tin . . . Sing in close proximity to these for added resonance.

Imitative Sampling

AS YOU'RE PROBABLY aware, many tracks have used vocal samples to imitate percussion and bass sounds. It shouldn't tax your imagination too heavily to realise that with sampling, a complete band or orchestra can be assembled with little more raw materials than vocal samples – either neat or heavily effected. With few exceptions, almost any vocal sound can be sussed to centre around a frequency or frequency band using the tuning and/or looping provisions on your sampler, and totally re-shaped with a voltage or digitally-controlled amplifier and low-pass filter to resemble just about any existing or imaginary instrument or synthesiser effect. Such is the magic of sampling.

Entire film scores have been recorded using only a lowly Minimoog and a multitrack tape recorder, emulating virtually every instrument of the concert orchestra with a handful of audio waveforms and a couple of envelopes. Sampling allows us to work with considerably more than the four or five basic waveforms that analogue synthesisers have limited us to in the past.

When using sampled voices to imitate other instruments, your raw sound material can be tailored at source by mimicking the instrument/effect you want to hear. Treating your vocal approximation with old VCF and VCA envelopes will go a long way in furthering the illusion. (Well worth brushing up on your analogue synthesis theory if you're not thoroughly familiar with all the different qualities that can be imposed upon a signal, by altering the manner in which we hear its loudness and brightness.)

General Attack Characteristics of Instrument Families

AMPLITUDE:

Attack	**Instrument Group**
Immediate	*Percussion, plucked/ struck strings.*
Moderate	*Brass, wind, bowed string, vocals.*
Slow	*Wind, bowed strings, vocals.*

FREQUENCY:

In tune	*Keyboard, wind, percussion.*
Flat	*Vocals, bowed strings, brass.*
Sharp	*Percussion, plucked/ struck string, vocals, brass.*

Of the universe of sounds available to us, the human voice strikes a special resonance in all of us impossible with any other instrument or combination of instruments. With creative sampling still in its infancy, we've a wealth of sonic colours open to us, requiring little more than a microphone, a sampler and your own voice. ■

If you have serious ambitions in recording, the move up to 8-track is a matter of when, not whether.

Emotionally, it is multitrack's equivalent of your first pair of long trousers.

Practically, it gives you creative scope more on a par with professional studios.

Up to 36 layers of sound can be exploited. Which is a world away from the ten offered by 4-track.

And linking to SMPTE and MIDI means there's little, in either music or A/V production, that you can't do with the right set-up.

But does it have to follow that this extended ability will be that much harder to use?

Will you find yourself bogged down by technology, when you should be buoyed up by inspiration?

In developing the Model 80 and other 8-track equipment, Fostex have made sure that this is far from being the case.

CONFOUNDING THE SCEPTICS

When we pioneered 8-track on ¼ inch, we dramatically reduced the bulk of the machinery and the size of budget needed to buy it.

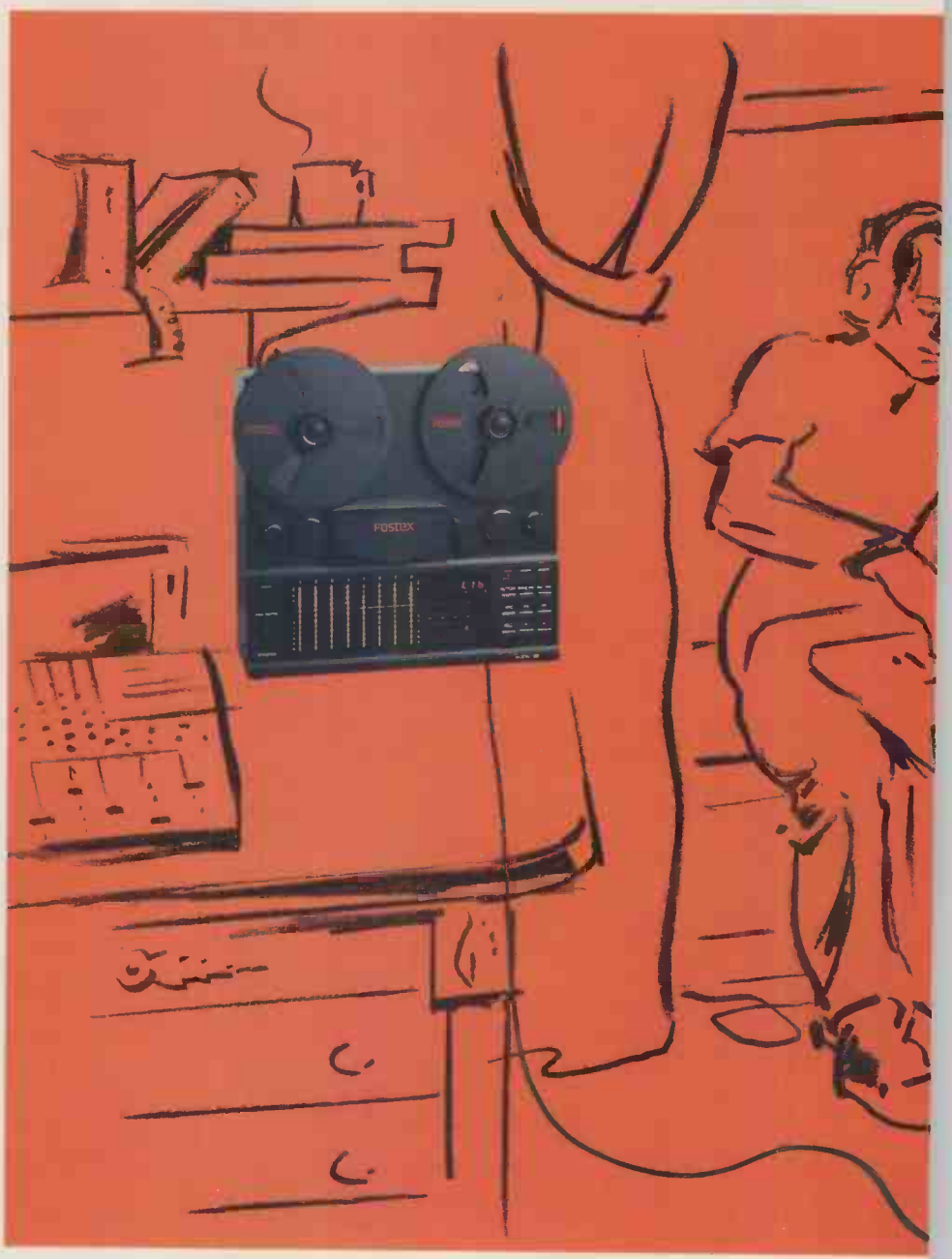
There were those who had doubts about the format, but familiarity soon bred content. It's now totally accepted.

In the opinion of 'Home Studio Recording': "It would take a good pair of ears to tell the difference between a Fostex 8-track and its ½ inch (or even 1 inch) rivals."

The Dolby C noise reduction system that the Model 80 incorporates, gives supremely tight, clean sound across the whole frequency range. It's the only system specifically designed for narrow gauge tape.

Crosstalk is minimal, even when using the infamous sync code. (For the spec-minded, the crosstalk figure of 55dB at 1kHz is a level that's more normally associated with 1 inch format machines.)

And drop-ins are entirely transparent. A tribute to the flawless inter-locking of the audio and transport electronics which have been created by our engineers for this machine.



THE LESS TIME YOU SPENI THE MORI

LESS IS MORE

The whole object of the Model 80's design is greater efficiency. Both in the way the machine works, and in the way you work with it.

Because although you've become more

involved in recording, you don't want the process of recording to become more involved.

Internally, microprocessor control and tried-and-tested deck mechanics provide exceptionally fast, stable tape transport.

While fewer moving parts mean greater reliability and optimum use of power.

PLAYING WITH MACHINES, YOU PLAY.

On the outside, everything is aimed at ease of use. A single switch on each channel selects playback, record or monitor status.

A remote footswitch lets you drop in or out when your hands are otherwise engaged.

Highly readable, twelve-segment LED bar graphs and a real-time tape counter give instant access to all the information you need while work is in progress.

And perhaps most useful of all, a miniature autolocator has been built in to provide not only the usual Zero Return, but two memory locations, which can be activated at the touch of a button for infinitely faster cueing.

A TOTAL SYSTEM

The tape machine is the heart of recording, but it doesn't stand alone. So the Model 80 hasn't been designed in isolation.

With the Fostex 450 Recording Mixer and the Model 20 Master Recorder, it makes up a completely integrated, ready-to-run system.

And, recognising the broader applications that are so much part of recording today, Fostex is also the only tape machine manufacturer to have developed lock-up devices for SMPTE and MIDI.

The 4030 synchroniser, 4035 system controller, 4050 autolocator and 4010 sync generator have made whole new areas and ways of working available and affordable.

The fundamental practicality, so apparent in the Model 80, is common to them all. The potential is fantastic.

For more information on these products, or a copy of the Fostex 'Cookbook,' send the coupon below to: Fostex Multitrack Information, Brent View Road, London NW9 7EL.

Please send me information on: Model 80☐ Model 20☐
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Photography *Ed Colver*

TWISTER

Programmable Automation Computer

MIDI automation of your mixing desk in a 1U-high rack-mounting box sounds convenient and effective but is it cost-effective? Review by Chris Many.

IT WAS ONLY a matter of time until someone brought out a rack-mounted, MIDI-based, high-quality automated mixing system. Of course, when you start cramming that much electronics into a single rack space, you're going to have to make compromises. The trick is to cut the right corners and retain the right features. If it's done well it could be a remarkable package. The risk you run is ending up with a dedicated unit that quickly becomes relatively useless in a marketplace that updates its wares twice a year. Twister, one of the latest additions to the proliferation of MIDI mixing automation packages, fits somewhere in between.

Overview

EACH SINGLE SPACE rack unit controls eight audio channels, so initially Twister appears pointed toward smaller studio applications. However, units can be chained together so that up to 64 audio channels are placed under Twister's control – enough for most major studio applications. Interfacing with a mixing desk is achieved through insert points – a standard arrangement in mixer automation. There are eight stereo jacks on the back of the unit for this purpose, plus an RS232 port (for connection to an external computer) and three MIDI ports (In, Out and Thru). The front panel contains eight buttons to select which channel of audio you're working with, and six other buttons which allow you to choose a variety of other functions (grouping, mutes and so on). Last, but not least, is the Twister equivalent of a fader: a dial and LEDs to determine gain.

Compromise number one: no faders and just a single dial to control attenuation. Channel switching selects the single track of audio you're controlling. Compromise number two: Twister is a "snapshot" mixing system. Not that it won't do real-time automation – it does – but the first half of the documentation describes the use of Twister as a means of recording and recalling audio levels. For those unfamiliar with this type of system, the snapshot method is just what it sounds like; a "picture" of the current attenuation levels, mute and group status is taken, and can be stored in internal memory. Twister has 99 memory locations to store these snapshots, and any one can be recalled at the push of a button or two.

Snapshot Mixing

OPERATION IN SNAPSHOT mode is very straightforward: select the channel you wish to adjust by pressing one of the eight buttons, and by using the dial (or "digi pot", as it's called in the manual), set the desired level. Three sensitivity levels are available which allow you to fine tune your mix: enigmatically entitled Coarse, Medium and Fine. By the way, Twister has been optimised as an attenuation only device, so when the volume control is all the way up, the LED bargraph display will show 0dB.

Mutes work just as simply: press the Mute toggle button, and mute the channels you wish. Once you've got the snapshot mix set up, store it to one of 99 internal memory locations. Grouping is also intuitive – press the Set Group button and select which channels you want included in the group. Voilà, everything now responds to the movement of the digi pot, relative to its original level. Everything is actually related to the highest level in the group, and if you try and push channel one (which is at –10dB, let's say) up a few notches, while channel two is already scaled to 0dB, you'll see flashing LEDs, informing you of your error. To handle this, you can exit from Group mode and return to Channel mode, in which case you can adjust channel two to its rightful volume.

What use is a snapshot mix? Well, live performance represents one answer, because you can select mixer and effects routings from your master keyboard as patch change numbers. Selecting pre-programmed levels for effects units in or out of the studio, such as your favorite reverb level mix, represents another. But to be honest, I'd find it hard to justify investing in Twister solely to store 100 preset volume levels, no matter how inconvenient it is to manually reset eight faders.

Real-Time Mixing

WHAT MOST PEOPLE are likely to want from an automated mixing system is real-time mixing automation. Twister is dependent on an external sequencer for storage and playback of mix moves. There are pluses and minuses to this approach – cue compromise number three. Your familiarity with the limitations of that sequencer will ►

► determine how easy or difficult it will be to use Twister. Some sequencers function well in this capacity, others not so well. But you won't have to learn new methods of storage, retrieval, editing and adjustment because you'll be working with a tool you're (hopefully) familiar with.

The cost of a storage medium is not included in this package (although by the time you've expanded it to 24 channels and added in the cost of a computer/sequencer, it's debatable whether or not it's competitive with other automation systems with a storage device built in.)

The disadvantages are obvious: you're relying on equipment outside Twister as a basis upon which one of its major functions depends. Because there are so many different sequencers on the market, it's hard to predict all the quirks and problems you might run into when interfacing Twister with any one of them. For example, your sequencer must not repeat information received at the MIDI In port at the MIDI Out port (or it must have some method of defeating this) or you'll set up a loop of MIDI data going to and from Twister, rendering the operation useless.

Mixing in real time using Twister involves getting used to mixing one channel at a time with a dial on a rack-mount unit instead of a bank of faders on a desk, or a representation of faders on a computer screen. I didn't find one channel at a time *bad*, but it feels odd using a dial to mix with. I suppose I could get used to it, but it's something you should be prepared for. Aside from the awkwardness of this setup, correcting mix errors, or even adjusting them can be a pain in the sequencer. First of all, you need to remember to save your moves on the sequencer each time you finish (although again, this depends on your sequencer: some require you to select a track before you begin, others afterwards; some will automatically cycle to the next available track while saving the last MIDI information received, others . . .).

To correct a move, you'll need to set up your sequencer to punch in and out at the appropriate points, or you can punch a few buttons on the front of the Twister unit. Twister listens to MIDI data coming in over the selected channel, but when you move the digi pot, it will stop listening and react to the data incoming from its own front panel.

A computer interface program is also available with the package for the Atari ST (for monochrome mode only, although colour is apparently forthcoming). This makes it a bit more controllable, as you have a screen with eight faders, and a duplicate of Twister's front panel display. Unfortunately, it does little more than mirror what you can accomplish from the front panel. You'd think it'd at least give you additional storage for snapshot settings. It's also not intended for real-time mixing, unless you have a second ST/Mac/IBM/C64 or stand-alone sequencer. Also, Digidesign's Q-Sheet package for the Mac (see review, January '88) will allow automation of the Twister from a computer screen while locked to SMPTE and playing back sequences.

The documentation is pretty thin – 34 pages with only 18 pages dedicated to the operation of the unit. There's no index, so you'll find yourself flipping through it to get any questions answered. On the left-hand side of every page, however, is a short, two- to three-word description of the information directly to the right – I didn't find it very helpful, though.

Verdict

SO, WHAT DOES this all add up to? Twister is an eight-channel MIDI automation product that requires you to mix with a dial or a mouse. It will store 100 snapshots of level, mute and group settings, all recallable from the front of the unit or using an external MIDI device. It allows real-time mixing but demands storage of this information to the sequencer of your choice. Its audio quality is excellent (the circuit board layout gives an indication of the extreme care paid to sound quality), and the (Aphex) VCAs used are transparent and produce no extraneous noise. But in spite of all this, I'm still not sure it's worth its hefty price tag.

If your system consists of a 4- or 8-channel desk and you don't predict a need for 16 or 24 tracks arising in the immediate future, you might consider looking into Twister. But keep in mind that you'll be mixing with mouse or a dial, one track at a time.

If the price were about half of what it is, I'd recommend this package to budget studios and musicians playing live. As it is, the compromises that have been made (a dial instead of faders, no onboard storage and mainly a snapshot-oriented system) make Twister's applications rather limited. I'm sure converts won't see it this way, but when I added up the figures and made comparisons with other MIDI automation systems I couldn't convince myself. ■

Price *Basic 8-channel system £995; Fader conversion computer £995; 8-channel console interface boxes £185 each; complete 24-channel system, £4580. All prices exclude VAT.*
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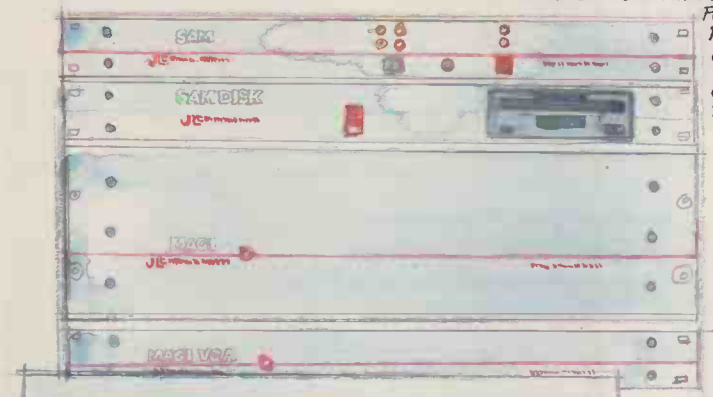

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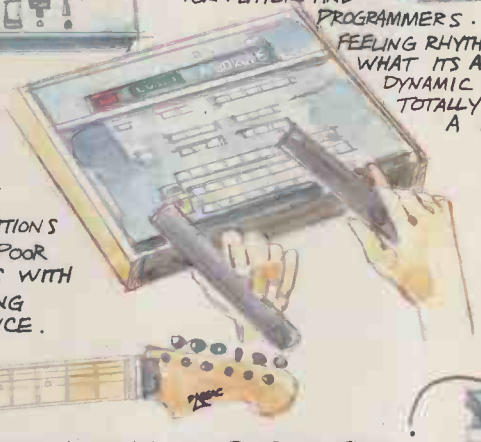

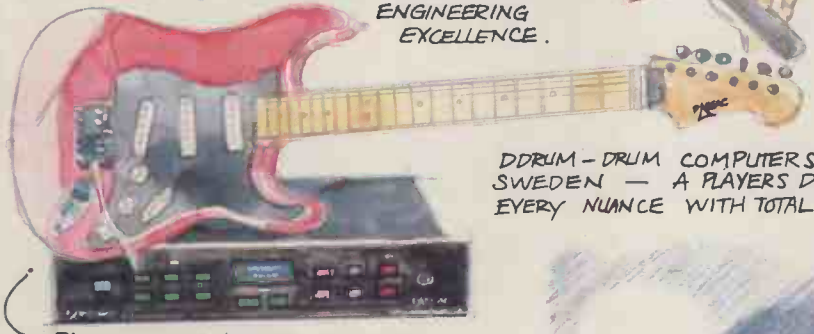

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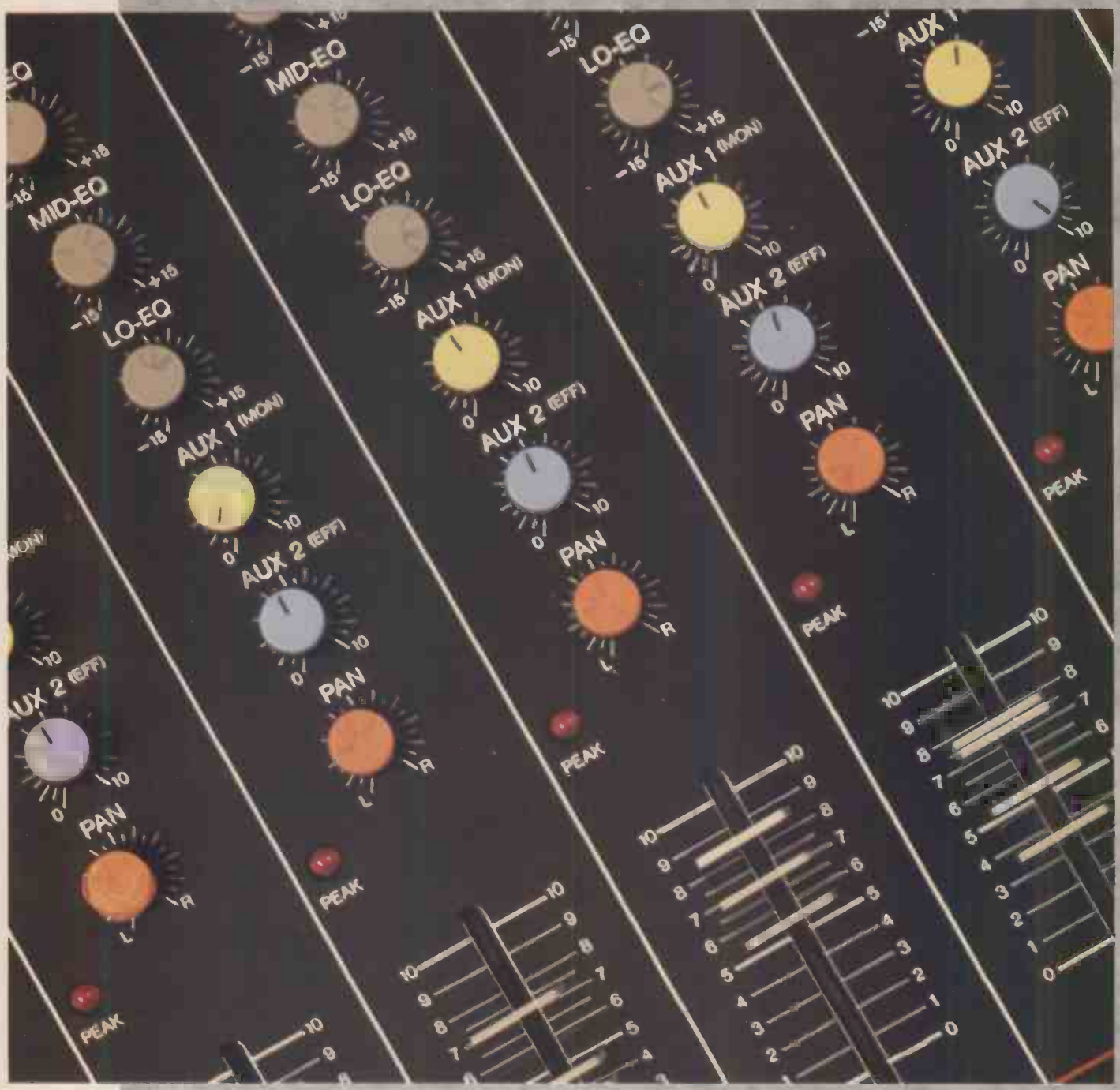
MIDI IN THE MIX



Photography *Tim Goodyer*

MIDI has expanded beyond the boundaries of playing notes and changing programs into the realm of studio automation – now you can use MIDI devices to help perfect your mix. *Text by Chris Meyer.*

TIME TO UPSET a few people. Let's say you've just written your best song ever – perhaps it's the best song anyone's ever written. It's even recorded, either on multitrack tape or into a MIDI sequencer. Fine. You're only half done.

The debate over which is more important – the composition or instrumentation and mix – probably started when the first caveman found two logs that sounded different when he hit them. Nowadays there's talk of producers "playing" the recording studio like an instrument. The problem is, they're the ones doing it – not you, the musician. But MIDI has finally integrated the music and the mix so that you can now have control over both. Now the studio *is* an instrument.

Playing the Instrument

OBVIOUS, BUT STILL ignored by some, is the fact that MIDI allows you to go back and change which instrument played which part. Would a sampled piano sound better than that FM Rhodes? But what about changing the orchestration during a song? With all the freedom that programmable synthesisers and MIDI sequencers allow, it's distressing to hear how many musicians limit themselves to one set of sounds throughout a song. Admittedly, part of this is due to increased use of samplers (which often have only one good sound per disk) because of the time it takes to load a new sound during a song. If you're using synthesisers, try spicing up your arrangement by changing patches for the second chorus or for every other bar – the latter is an old technique called "hocketing". At last, you can justify the 3000 DX patches you've collected over the past three years.

On samplers, you can use alternating versions of a sound by changing just a few parameters of the basic sound – amplifier decay and filter cutoff are probably the easiest. Horn disks tend to come with ▶

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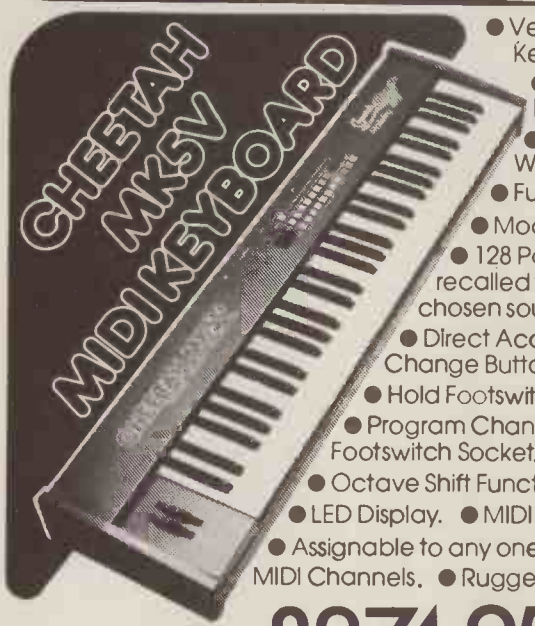

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► several instruments of the same family on one disk – these are particular fun to hocket with. Changing whole drum kits or a single percussion sound inside a kit is just as effective.

Making program changes during a sequence often takes a little more than the anticipated amount of thought. Many samplers choke sustaining or releasing voices when you change sounds. Some machines also have a delay when a new sound is loaded. Placing the program change a clock beat or two before the first note to be played with the new voice gives the sound the maximum time to die away and gets the change over before the downbeat of the next bar.

You can simplify a tricky synthesiser orchestration by saving the patch data with the sequence itself. It's not unusual to have more patches for a synth than fit inside the machine's memory at one time. This would normally require careful notation of which patches to load to replay a particular sequence (something that you'll still have to do with sampler disks until hard disk systems become more common and less expensive). However, it's not unusual for today's sequencers to record system exclusive data – the stuff synth presets are made of (or can be stored as). Consider a synth's internal program memory to be a scratchpad, and keep your patch library in cartridges or librarian programs. Load the patches you use for a particular sequence into the internal memory. Once happy with your orchestration, save the patches used in a couple of blank bars at the start of your sequence (or as a "setup" sequence you play once into your synth before starting work on a particular song) and you've one less thing to worry about.

"MIDI has finally integrated the music and the mix so that you can now have control over both – now the studio is an instrument."

Many synths and samplers these days also transmit and receive the standardised MIDI master volume controller. Anything from a simple balance to a rudimentary mix can be created using this feature. More instruments receive it than transmit it, so check your owner's manuals. If you have one instrument that transmits it, you can "ride" its master volume knob to mix down all the other devices in your setup that receive it. Otherwise, you'll have to resort to one of the all-too-few MIDI performance boxes (Yamaha MCS2 and its like) that can send it, or use a mapper (Yamaha MEP4, Axxess Mapper and so on) that can translate something such as a mod wheel into master volume. If the worst comes to the worst, there's always hand-typing volume information into the sequencer (it's controller 07, for those with sequencers that let you directly access the MIDI data).

Signal Processors

THE SONG AND orchestration are complete. The next step is playing with the processing of the sounds. It should be noted at this point that the MIDI automation of processing and mixdown we're going to be talking about from here on doesn't apply just to MIDI sequenced material. It's perfectly legitimate to use a MIDI sequencer synced to tape for changing details of the mix. MIDI has progressed beyond what notes get played.

Almost all reverbs and multiprocessors (except for the cheapest and, oddly enough, most expensive) have MIDI on them. These MIDI implementations typically cover program changing, saving patch information and perhaps changing the output volume.

Sound familiar? They're all the things we talked about in relation to creative orchestration of the sounds in a song. And the same principles apply to signal processing. Effects levels can be changed and presets remembered in the same way as instruments, though more mileage can be had from changing the treatments.

Just as some synths cut off the old sound and trigger the new sound when a program is changed, most reverbs mute and cut off the old signal, switch programs (the Lexicon PCM70 in particular takes a long time to do this), and start their new effect as if sound has just been fed to them. The best way to deal with this is to find a place where the instrument being effected has been silent for a few beats and slot the program change in there. If no such space exists, prematurely end the effect by fading it out with the master volume control, change it, and push it back up immediately. Some effects change fast enough that they *can* be placed right on the downbeat without any unpleasant side effects – you only really hear an effect like chorusing on the body of the sound, not the attack, so missing the very start isn't a problem. Experiment with different effects.

Here's an interesting trick to try with programmable delays. Delay an individual drum sound or the bassline (without letting any of the original through) to alter the "feel" of the rhythm section. Doing it for a break or chorus is an effective way of reviving interest in a flagging song, and is a hell of a lot easier to do with a DDL and MIDI than altering the line in the sequencer.

Delays or gated reverbs can also help play with the rhythm of a song. Stretching a gated reverb on a snare or tom from an eighth note to a quarter note appears to slow a song down; going to a sixteenth note tightens it up. Delays mixed with the original can be manipulated from a straight timed echo to a swing or triplet figure and back again. This will liven up an otherwise repetitive rhythm track. Making these changes as part of the MIDI sequence makes the treatment as much a part of the song as the notes.

To figure out what delays you need, dig out your calculator and invert the tempo so it becomes beats per minute to minutes per beat; multiply it by 60 (for seconds per beat); multiply by another 1000 (to get milliseconds). Now divide it by two for eighth beats, four for sixteenths and three for triplets.

Programmable equalisers are a relatively new phenomenon. An EQ change can work as well as a subtle (or, of course, drastic) program change for adding sonic variety. For example, two entirely different sets of equalisations and ambiences can be swapped every few verses – one restricted to the mid range with some distance to it, and the other right in your face and pumped to the ends of the frequency spectrum.

Dynamic MIDI

SO FAR WE'VE discussed fairly static changes in sound – similar to an instrument being able to play notes and change programs, but having no performance controllers – like mod and pitch wheel, aftertouch, and the like. Some newer signal processors (like the Lexicon PCM70, ART DRI and Eventide UltraHarmonizer) are starting to allow real-time changing of their parameters via MIDI.

The most common use of dynamic MIDI in signal processing so far is harmonising – selecting what intervals are created based on what MIDI notes are played into it. Creating additional notes is more a part of the song than the mix, but what dynamic use of MIDI is doing is blurring the distinction between the two.

Other dynamic applications of MIDI might be changing depth of chorus or to have reverb room size changing with the pitch of the notes being played – say, smaller for the high notes; larger for lower ones. The ultimate goal of a dynamic MIDI implementation is to make any parameter accessible from the instrument front panel alterable over MIDI. A new range of effects and ideas from the sublime to the atomic suddenly appear.

Mixing

WE MOVE FROM the creation and modification of sounds to the mixing of them. As with signal processors, there are both static (referred to as "snapshot") and dynamic MIDI level mixers. Snapshot mixers are mixing desks that have the ability to remember settings of levels, pan, EQ and so on, and have those settings recalled via MIDI program changes. This can be thought of in exactly the same way as recalling a reverb or EQ preset.

The most basic use of a snapshot mixer is muting and unmuting audio channels. Inflexible? It's actually useful enough for outboard mute boxes (like JL Cooper's MIDIMute) to be in demand. At the very least, they can be used for cutting out tracks while they're unused. This gets rid of unwanted tape hiss and quiescent synthesiser hums. I was sceptical about how useful this actually was until I used one – it sounded like I was using far more expensive equipment than I actually was. Mutes are also useful for covering thumps from switching programs or punching in and out on tape. More artistic applications include muting instruments to either thin something out or do a full "breakdown" – again, easier than editing a sequence to remove an instrument for a few bars. ►

► With the exception of the Yamaha DMP7, all dynamic MIDI mixers currently on the shelves are intended to be used as add-ons to existing mixers. In various incarnations, they are all VCAs (Voltage Controlled Attenuators) linked to MIDI. Typically they plug into the insert points of the desk and control the level of the signals before they reach the faders. Hence the "VCA boxes" become a set of ghost faders that control the mix of the song. Multipass mixing is just like multitrack recording or sequencing – it's often more convenient to be able to work on one line, get it perfect, and go on to another instead of trying to "play" it all live on the desk at every pass.

"The ultimate goal of a dynamic MIDI implementation is to make any parameter accessible from the instrument front panel alterable over MIDI."

VCA boxes offer an advantage over using the master volume on the instruments in that they tend to operate a lot more smoothly than the instrument itself. Internal volume controls also may attenuate a voice before it gets to the noisiest part of the output stage, leaving a hiss behind even when they're supposedly right down.

The price of VCA boxes is largely governed by three things – how they are controlled, the quality of the VCAs, and how intelligent they are. Some packages allow just an alpha wheel for changing VCA levels. Others take the form of VCAs controlled by a computer program (running on a personal computer) and have graphic faders which you move with a mouse to perform the mix. If these offend your sensibilities, you'll be best off looking for an alternative fader (Yamaha MCS2, or the data slider on many master keyboards) to do your mix. Others (JL Cooper's MAGI and MixMate, MegaMix, Yamaha DMP7) have "fader boxes" that are a second set of faders for the VCAs (the Yamaha goes as far as to have motorised faders to show precisely where the VCAs think they are).

A direct relationship exists between the cost of an individual VCA and how much distortion and noise it adds to the signal – a critical listening test is very much in order before deciding which one to buy. They're just like any other piece of recording gear – forget the hype and weigh what your ears are telling you against the price.

Each audio channel (VCA) of one of these boxes is typically assigned to a MIDI continuous controller, all on the same or different MIDI channels. Each channel should be thought of as a separate instrument as far as MIDI recording goes. Recording one channel's data is like one instrument line – make recording passes until you get it right. Punch in and out of the middle of a move to make smaller corrections. However, when channel 2 comes up, the fun begins. Just like an instrument pass, you don't want to lose what you did on channel 1. So, if you're using a normal MIDI music sequencer and a VCA box with no onboard intelligence beyond which MIDI controller goes to which VCA, you'll either have to put each channel on a separate track, or put each VCA on a different MIDI channel and be careful which channel you erase if you want to re-record a move.

To counter this, some boxes have a degree of intelligence built in. They'll take the MIDI information from the previous pass, merge it with a channel's move made with their local controller, and feed the mix back out to be recorded on a new sequencer track. The idea here is to keep alternating between two tracks on the sequencer – one playing back the previous pass, one recording the new pass. This has the advantage of backing up each pass but the disadvantage of you having to remember to ping-pong between tracks on successive overdubs.

Overdubbing an automated mix also differs from a musical line in that you'll often want to match the previous level of the ghost fader before starting to overdub to avoid sudden jumps in level. This is called "update mode" and the process of matching the previous level is called "nulling the fader". No current musical sequencer has this mode. Some packages (JL Cooper's SAM and MixMate, MegaMix) step all the way around the MIDI sequencer and take care of recording and updating themselves.

So how useful is automated mixing at this level? Let me put it this way: I recently mixed a series of radio plays that each had dialogue, music, sound effects, and unwanted noises (punch in/outs) recorded at full volume across seven tracks. I'd like to meet the person who thinks they can remember almost a half hour of continuous fades, mutes, pans, and EQs. I ended up using a JL Cooper's SAM and MAGI to automate the levels, mutes, and effects returns, leaving my hands free for the fairly menial tasks of panning and punching EQ in and out. I simply couldn't have managed a manual mix.

I really only scratched the surface of automated mixing; the revolutionary Yamaha DMP7 has brought the dynamic MIDI concept to a full mixing desk, with every parameter being potentially automated.

Can't Keep Up . . .

MIDI GAVE US power over musical compositions from its inception. Now it's giving us the same power over the mix. Sadly, very few people seem to have chosen to exploit these possibilities so far. Perhaps it's technological overload from all the options available (note how well preset devices such as the Alesis line are doing); perhaps it's too new a concept to have been fully assimilated just yet. I hope so. ■

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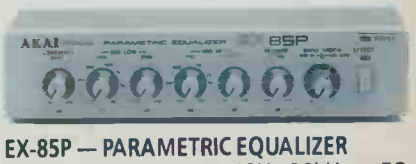

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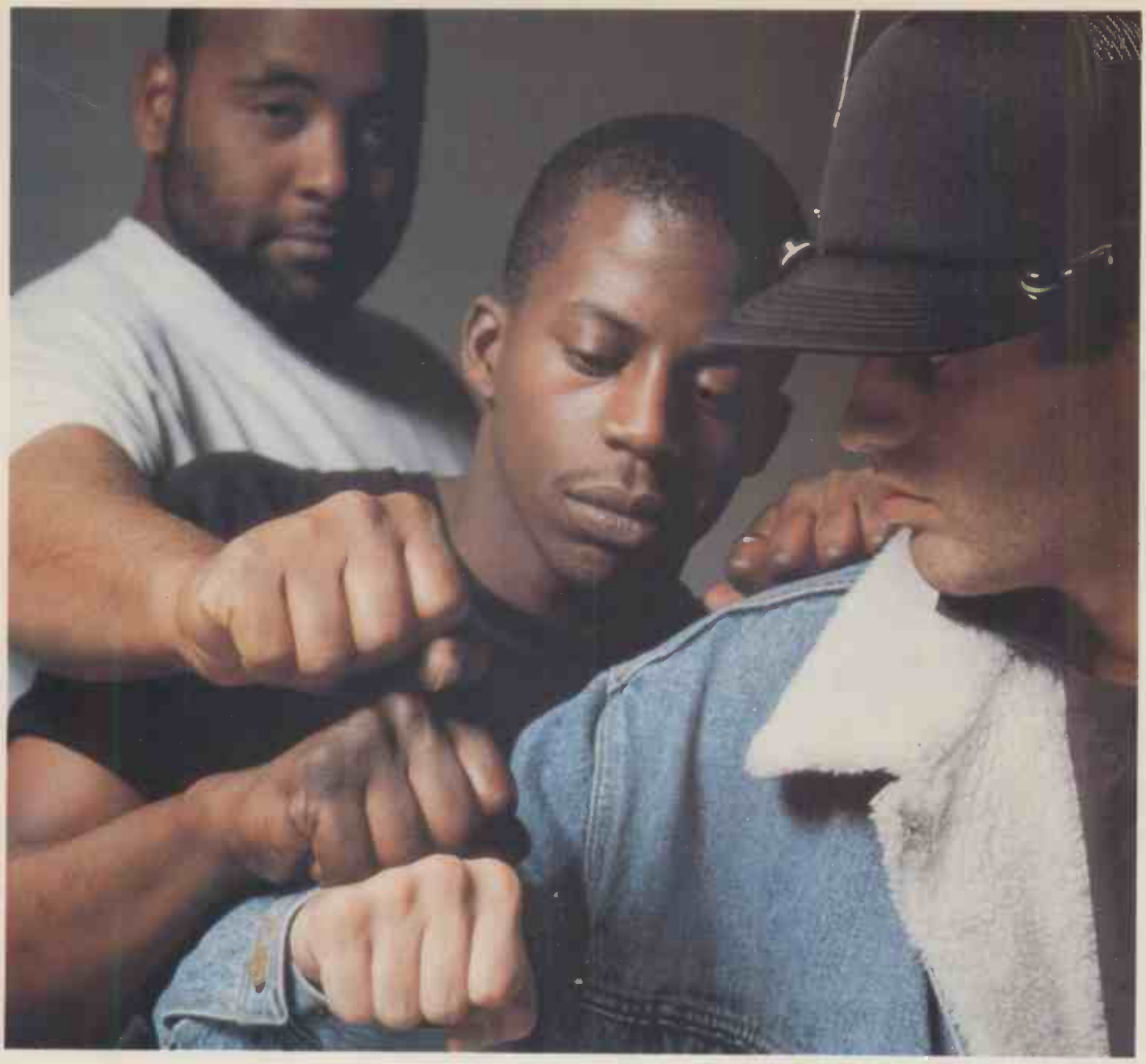


WIZE UP

At the cutting edge of the new British hip hop movement are Three Wize Men, the venerable Roland TR909 and an Akai S900. Interview by Tim Ponting.

DEEP IN DARKEST Peckham, at the very heart of the Gloucester Road Estate, someone's very angry indeed.

"My baby got infected in her carry-cot, there's silver foil all over the block, and that means skag, a new disease, goes hand in hand in places like these . . ."

A new force in British rap has arrived, sharp and uncompromising. And a new generation of rappers attends it – a breed far removed from the meathead unable to see beyond his own ego.

DJ Jemski Jah is a Wize Man in many ways. As both rapper and producer of the group, he represents the thinking front of British hip hop. Enveloped in a large green armchair in the corner of a room full of empty boxes, his slight figure belies the power behind the microphone, the mind behind the mixing desk. He tells me about his past.

"Though I'm not really a DJ, I was really into hip hop at the time when nobody else was playing it", begins the story. "So I used to do warehouse jams just to earn some cash. And that's how it all came about really. I used to hire AJ (from the Wize men), as security. When I moved to Peckham, I discovered he lived just down the road. I knew Fil (Chill, programmer) from school. He's been a drummer ever since then. About three or four years ago, he bought an RX11 and that was it, he took to it like a fish to water – he discovered programming and how much more you could do with it.

"We always had a dream of being able to sample things before samplers were invented, and then suddenly there they were, what we had dreamed about. It was just a case of getting to grips with them."

The first Three Wize Men LP, *GB Boyz*, is a testament to the new attitudes in British hip hop, both musically and lyrically. The originality of grooves such as 'Kuttin Wikki' and 'What It Iz' is supported by an evident familiarity with the

technology available. Mmmm . . . I wonder which Atari package it was sequenced on . . . or was it a Series III?

"Actually the whole thing was sequenced on a Roland 909 drum machine. Not many people know, but it's got a rather nifty little onboard sequencer. It's accurate to sixteenth notes only, which is weird 'cos you can't really get a human feel. We just used one of those and an Akai S900. It was the most simple sampling and sequencing system in the world – but it proved really effective."

The TR909 and its predecessor, the TR808, have been compared with classic cars. Like the Minimoog, they have a character and appeal that has far outlasted many of their analogue brethren. An industry standard in hip hop, it's almost as if a record without the long decay of the 808's analogue bass drum is a forgery.

"It's one of those things", comments Jemski, "If you're going to make a hip hop record, you've got to have an 808 bass drum, 'cos that's what the kids love. Was 'Mr Roland' aware when he invented it, I wonder? The thing is, it's simply the heaviest bass drum. It's even heavier than some of the Dynacord ones we've been using recently."

As a drummer, Fil Chill has a strong interest in electronic percussion for the express purpose of translating the essential Wize sound into live performance. The Dynacord ADD-one system has proved a useful tool.

"We're still using the 909 live", explains Jemski, "but Fil's playing a Dynacord kit over the top – not drum sounds so much as various odd samples, bits of scratch, whole drum loops and things like that. It's quite interesting. We played our first live gig the other week in Holland as an experiment. We've always used backing tracks before because we've never had any equipment. It went really well – and we got a real buzz off it because, for the first time, it was live and we could stop and start and change and chop. It's exciting.

"Fil programs up, say, a bass drum and hi-hat pattern on the 909 and then plays the percussion parts, scratches or vocal samples over the top. Or he does the inverse; he plays the bass drum, snare and the hi-hat and programs a percussion part on the 909. People can't really tell out front what he's actually playing – but they know it's live."

A HIP HOP act on stage without a backing tape in sight? Pull the other one. Jemski will probably be telling me a live LP is next on the cards if I'm not careful.

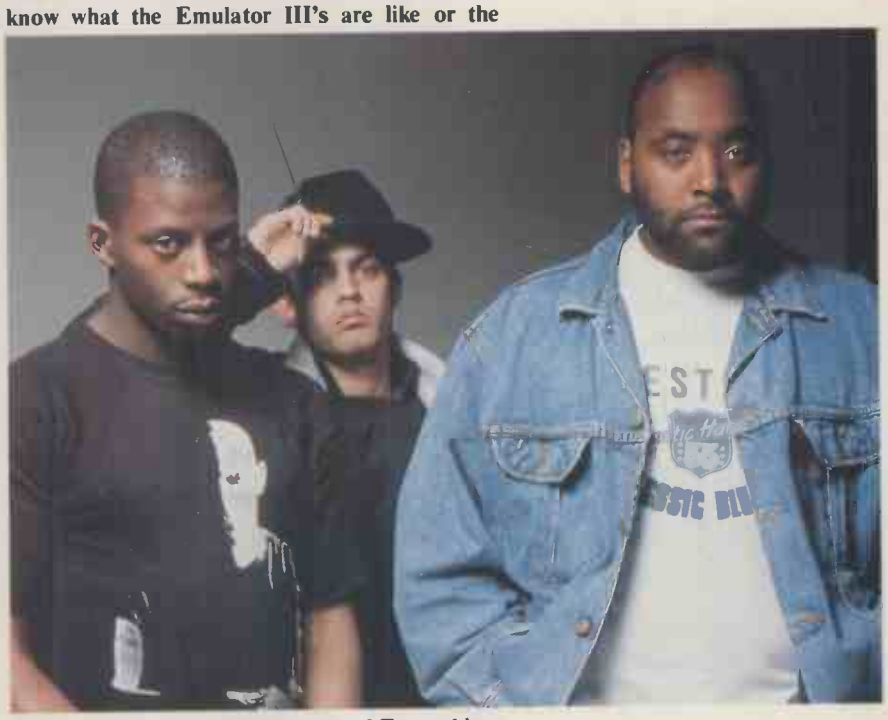
"Actually, the plan is to take all our new gear out live, with a combination of the Dynacord and the Akai/Linn MPC60, and record it all live onto DAT. We want to see if we can actually make our album while we're on the road – do ten gigs or something, get really into it then . . ."

He pauses as if struck by a sudden thought. "Well, actually record *every* gig, and then try and edit an album out of all the best parts. It's actually a practical concept because all the new songs are quite live orientated. And we've got such a good sound – even though at that last gig it wasn't one hundred percent – that we thought 'why not?'.

"You get a different sound at every gig. We've got a guy called Tim Mason who's a brilliant engineer and we'd bring him along with us. He knows all the songs and the setup. It's a fascinating concept: to make a really good-quality album which has cost absolutely nothing in studio time, just because of the quality of the sequencers and the sampling equipment we're using. And those new ElectroVoice mics, the ND757's, are excellent for rap. They're very sensitive, but they compress when you get louder, which is quite handy. They'll handle anything from a whisper to really giving it some bollocks. Everything sounds crisp. I don't know about singing so much but it certainly seems to be the ultimate rap mic.

"At the moment we've just got a publishing deal, and we're looking to purchase some new gear within the next couple of months which should be interesting. Fil's looking at the Roger Linn/Akai MPC60, 'cos he wants a device which he can sequence with. He loves the old Linn 9000, but it's just not good enough these days. I think the MPC60's the sort of sequencer for him.

"I want to buy a keyboard sampler, but I'm not quite sure what at the moment. I quite like the look of the Ensoniq EPS, cos it's got a nifty little sequencer in it. But really I want something with two or three minutes of sampling. I don't know what the Emulator III's are like or the



Emax HD, but I'm always wary of E-mu things 'cos they always fuck up. SP12's, they always fuck up.

"What I like about drum machines is that they all sound different, they all have their own character. Like the Korg DDD1, it has its own particular sound, the same way that an 808 or a 909 has. There's no way, even if you sample it, that you can duplicate it, because it's also the way it sequences, all the intonation. If you feel a track needs that DDD1 mechanical sound, it's better to hire one rather than use samples. On one of our tracks we thought 'yeah, the DDD1 would be ideal for this' so the hire guy got one down and that was it."

"Fil and I made demos three years ago with heavy beats programmed on a DMX – I took it to major record labels and they just laughed at me."

Besides a fresh look at the available technology and recording techniques, the Three Wize Men also seem to be rethinking what might ▶

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►be termed "the hip hop approach to song structure".

"Listen to Mantronik; sometimes he has really strange single-bar and two-bar intervals."

At all stages during the construction of a Wize track, an eye is kept firmly on the overall verse-bridge-chorus patterns.

"I write a vocal rap which is then structured. I rehearse it with AJ, and then we go to Fil and do something live so he gets a feeling for the rhythm. Then he programs up a simple beat, and we formulate the song into a structure with breaks and bridges and so on. That's what we're trying to get into – rap as a sort of song form. Then Fil works on the sequencing and the bassline, before we come back to the drums right at the end and put in all the fills and the detail."

For certain cuts the rap is everything; everything is developed from the rap. For others . . .

"Fil will write a monstrous beat and I'll think 'yeah, I want to write a rap for that'. Or we'll choose a classic beat from the past like 'Funky Drummer' by James Brown or any one of those break beats and we'll just program that up and slot it into the structure. That's quite interesting as well; we sample break beats and drop them in on top of other beats, getting some polyrhythms happening quite randomly. You can take any record and slow it down; sometimes it sounds completely different. We tend not to steal samples so you'd notice. For example, if you take a bass drum, how can you tell where it's from unless you're the drummer who initially recorded it? You'll never be able to. You hear bass drums on CDs which you like and then you just sample them. It's as simple as that."

ONE SURE WAY of discovering what so called "sample thieves" plan to be filching in the near future is to ask them what music they're currently listening to. But Jemski's quick off the mark – he's already sampled it.

"We stole a break off that new Bambaataa stuff, 'Shout It Out' the other day, catching four bars of it, looping it and building up a track on top. We didn't use it in the end, but that's sometimes what we do; you find an interesting beat, loop it and then drop another beat over the top.

"I really like the new James Brown stuff that Full Force have produced. They're my favourite producers at the moment – I think what they're doing is brilliant. I think the UTFO album that they did is the highest-tech recording I've ever heard as far as sequencing, sampling and scratching is concerned. It's remarkable; they've sampled scratching in tune, and then pieced it all together into very complicated little sequences and breaks – just the tiniest little samples, four hundredths of a beat or something. It's well worth checking out."

There are many who hope that the Three Wize Men will prove to be the beginning of a reversal of the US domination of hip hop, and that its homegrown counterpart will become better regarded than the imported variety. It's high time. At long last British record companies are realising the potential of British rap artists: Derek B, Faze One, Overlord X, the Demon Boyz . . .

"British hip hop is different in a way because it's so much more original. But it's been so hard to get record companies interested in the past. Fil and I made demos three years ago with heavy beats programmed on a DMX, the drum machine of the moment. We got a guy from Mastermind Roadshow to come down and do some scratching for us. I took it to major record labels and they just laughed at me. And it *was* good stuff, similar to a lot of things that have happened since. But because it's so hard to get people interested, it's only really been this year that everything's taken off.

"The product which is appearing now is of a better quality because people in Britain have listened to the Cookie Crew and the She Rockers and people like that. They're all getting together right across the spectrum and doing everything themselves, whereas in the States people are produced more. I think they just take rappers off the street, write them a track and say 'bust a rap'. Here, the artists tend to want to be more involved in the complete process.

"I think with the new technology, that's what's going to happen. Rappers are just going to buy a small PC, an Atari or something, and a sampler, and get their stuff together at home – just wheel it in the studio and record it. I think that's the future. Because rap's the only form of music which is embracing the new technology, which never tries to mimic an acoustic instrument with its sampling; it's moving forward in that respect. That's why I like rap – because in a way it's denying all the acoustic sounds, guitars and things. We're saying 'why use an acoustic sound – let's use something heavier'."

Jemski seems to relish the prospect of using all the latest technology in a home environment: "professional home studio recording" if you like. In an ideal world all the gear would be available on the NHS, but in reality, it all costs rather a lot of dosh.

"We didn't even have a sampler until a couple of weeks ago; we felt really held back because of the lack of equipment. But that's what we plan to do, sample all sorts of beats, do lots of sequencing with those samples and actually try to create whole songs within that framework. With something like the Ensoniq EPS, it might be possible to create hip hop songs completely within one machine and master straight onto DAT, provided you have access to some fairly good monitors. It's got a good sequencer, and if you've got a hard disk you're going to have a lot of sampling time available. I'm sure it's possible; and I'm sure that's what's *going* to happen as well. Mantronik used one of those Akai 12-tracks when he made his first LP, and nobody knew. He still uses a 909 now.

"There are machines coming out now which are going to change the whole music industry. It's so awesome, you know? What else do you need? Maybe a keyboard, and that's it. As soon as the technology's sorted out a bit more . . . I'd be a bit dubious about buying something now, spending six or seven grand on some sampling and sequencing system, because I'm sure something heavy's going to arrive at any moment. Two years ago there wasn't the S900; now everything's 16-bit and S900s are looking out of date already. Ten years ago there weren't even any sequencers . . .

"That's what I think is so brilliant, that's what's so exciting about music today. After we've done this live LP, I'd like to record the next album in my bedroom." ■

YAMAHA MIDI GRAND PIANO

While MIDI is undoubtedly the performance aid of the '80s, many players still regard the grand piano as the ultimate instrument. Does Yamaha's MIDI grand represent the perfect fusion of tradition and technology? Review by Simon Trask.

LET'S NOT BEAT about the bush. Despite the many advances in music technology made in the past few years, ultimately there's still no substitute for a real acoustic grand piano. Not surprisingly then, many an upmarket recording studio still boasts a grand piano in its arsenal of hi-tech gear, and the beast has yet to be banished from the touring schedules of the rich and famous. Like dinosaurs, the grand piano may be on the big side, but it isn't about to become extinct on us.

As MIDI technology continues to invade the lives of musicians and recording engineers, the time is ripe for someone to unite MIDI and the acoustic grand. And who better than Yamaha, who have a long history of piano manufacturing to compliment their hi-tech expertise.

Seeing the Light

UNTIL YAMAHA'S ENTRY into the field, the only option open to musicians and studios wishing to bring MIDI to the acoustic piano has been the Forte MIDI Mod, a retrofit modification which adds extra mechanics to the piano's existing mechanics in order to achieve its ends. The disadvantages of the MIDI Mod is that it tends to alter the feel of the piano keyboard and it has a limited MIDI spec which belies the piano's potential as a controller keyboard for a MIDI setup.

Yamaha have avoided the problem of extraneous mechanics by employing a system of optical sensors which "read" light beams emanating from red pinpoint LEDs. Each piano key has a pair of light beams which are located in the path of the hammer. The optical sensors detect when these beams are broken, allowing both the speed (velocity) and the timing of the hammer to be detected just before it hits the strings, while a further optical sensor located beneath each key senses when the key is released. It's a system which works remarkably well, producing unerringly accurate response and no delay.

With the aid of a pressure-sensitive strip located underneath the keyboard (the only "mechanical" addition to the piano), Yamaha have also brought channel aftertouch capability to their MIDI Grand. Not to the piano itself, you understand (let's not get carried away here).

But this is only half the story, because Yamaha have given their piano a thorough complement of MIDI control features. These require a digital-access control panel to be built into the body of the piano, immediately above the keyboard. In case you're shuddering at the thought of major surgery being visited upon your precious grand, I should point out that the only surgery involved will be extricating it from your studio/conservatoire/living room.

Why? Well, Yamaha's background in piano manufacturing means they've been able to build the necessary electronics into their own pianos – specifically the C3E and C7E grands (without the electronics, respectively £7399 and £10,999 including VAT). The fitting is done at the company's piano factory in Japan, where it's easy enough for them to pull the requisite number of pianos off the regular production line. Not only does it make sound marketing sense, but also sound practical sense.

Yamaha's decision to go with their own piano means that if you want MIDI you'd better like the piano that comes with it. Fortunately, most people are unlikely to be put off by Yamaha's piano, which has a firm, rich tone, and a consistently fine quality over the entire keyboard. The keyboard itself feels very comfortable to play, and has above all a very *musical* responsiveness. The question of touch is an important one, and surprisingly Yamaha haven't included velocity scaling over MIDI as a means of tailoring the responsiveness of MIDI instruments to the touch of individual musicians.

Panels and Pedals

REALISING THAT PART of the grand piano's appeal lies in its appearance, Yamaha have managed to minimise the visual impact of their hi-tech additions. For a start, the I/O panel is tucked away on the underside of the piano. Here you'll find the power switch (no jokes about "switched on Bach", please . . .) together with one MIDI In, four MIDI Outs, a breath controller input, two footswitch inputs (MIDI Out on/off and memory change) and two footpedal inputs (volume and modulation). Meanwhile, at the left-hand end of the keyboard are two wheels familiar to synth users, namely pitch-bend and modulation. No, Yamaha haven't come up with the first undulating, warbling acoustic piano powered by human breath – all these controls are MIDI-only.

Foot controllers are nothing new to the acoustic piano, of course, and the MIDI Grand has the usual trio of damper (sustain), soft and sostenuto pedals. The action of the first two can be conveyed over MIDI, but for some reason the sostenuto pedal remains resolutely acoustic.

Also on the underside of the piano (but readily accessible) is a lever which allows the piano sound to be muffled (pulling the lever forward brings a row of felt pads up against the strings). Assuming that you don't want to layer acoustic piano over *all* your electronic sounds, the muffler is a very good compromise – with even modestly-amplified MIDI instruments, the piano is barely audible.

The most visible sign of hi-tech influence on the MIDI Grand is the aforementioned control panel. Though Yamaha have made it as unobtrusive as possible, there's no getting away from the centrally-located 2X40-character backlit LCD window. Operationally the panel is well thought-out, with many dedicated function buttons and never more than two parameters per button – all of which helps to lessen the potential headache of digital access.

Grand Performance

THE MIDI GRAND'S parameters can be stored in 64 Performance memories which are selected from the front panel (in bank/number format) or remotely via MIDI patch changes. These memories can be SysEx bulk-dumped to an external MIDI storage device (Yamaha's MDF1 MIDI Data Filer, for instance) for subsequent recall if required.

The MIDI Grand uses two processors running in parallel to handle MIDI Outs A+B and C–D respectively. For each processor you can define volume, pitch-bend, modulation, sustain, aftertouch and breath controller on/off status together with values for low/high level scaling (+/–15), low/high key limit (A1 to C7), transposition (+4/–3 octaves in semitone steps) and MIDI Out channel (1-16).

Additionally you can define portamento time (0-127), volume level (0-127), patch number (1-128) and on/off state for each of the four Outs. The control panel has a dedicated on/off button for each Out, together with a global on/off button. In addition, as mentioned earlier, MIDI transmission can be turned on/off globally from a footswitch. Fortunately, Yamaha have successfully avoided the potential problem of MIDI drone notes.

The key-limit settings allow you to define two MIDI zones – one for each processor. Each zone can cover any range from an individual note to the whole keyboard (so of course it's an easy matter to overlap zones). Level scaling allows further variation by letting you determine how and where MIDI'd sounds will fade in/out across the keyboard.

With an instrument hanging off each Out you can layer two MIDI'd sounds per zone, with independent patch selection on each instrument and the ability to preset the volume balance. Of course it's also an easy matter to limit MIDI'd sounds to selected area(s) of the keyboard, leaving the rest piano-only, while further textures can be created if your slave MIDI instruments themselves allow split textures.

To take advantage of the MIDI Grand's zoning features you need to use at least two of the piano's MIDI Outs, a consequence of the piano's "hard-wired" system architecture. Another consequence is that you can't take advantage of multitimbral instruments, while if you want to record into a MIDI sequencer then you have to forgo the piano's zoning features altogether.

Incidentally, it's worth mentioning that although the piano itself is 88-note polyphonic, for MIDI transmission purposes polyphony is reduced to a more modest 16 notes.

If you're into MIDI diagnostics (no, it's not a new lifestyle religion) then you can summon forth the MIDI Monitor display, which allows you to read the output of the two processors and the input to the MIDI In socket (in hexadecimal, I should add). Courtesy of the User Program function, you can also enter your own MIDI messages in hex, up to a total of 40 bytes, for each Performance memory. The same data sequence is transmitted over all four Outs, though transmission can be turned on/off for each Out. The uses (and abuses) of this feature depend on your ingenuity, but obvious examples include sending a Start code to a drum machine, and sending additional patch changes to MIDI'd signal processors.

The logical next step for Yamaha would be to turn the MIDI Grand into a late '80s player piano – with MIDI sequencing substituting for the traditional piano roll. This would allow the Grand to be fully integrated into a modern-day sequencing setup. In fact, Yamaha already produce an upright player piano (the MX100R, £6250 including VAT) which offers limited MIDI features coupled with internal sequencing and storage to a built-in disk drive. However, it looks as though MIDI Grand owners will have to wait until next year for a playback option.

Verdict

IT'S HARD TO overestimate the scale of Yamaha's achievement. The bottom line is that Yamaha's system *works*, and that it affects neither the feel of the keyboard nor the sound of the piano. The MIDI Grand represents a significant merging of old and new technologies, with neither side losing out in the process.

Quite simply, it's in a class of its own. ■

Prices *C3E (6') £10,999; C7E (7'4") £14,999.*
More from *City Music, Campbell House, Colin Campbell Court, Derrys Cross, Plymouth. Tel: (0752) 673166; Chappell of Bond Street, 50 New Bond Street, London W1Y 9HA. Tel: 01-491 2777; Fox, 54-58 The Headrow, Leeds. Tel: (0532) 450350; Dawson's, 65 Sankey Street, Warrington. Tel: (0925) 32591; Williams and Sons, Unit 5, Earlgrey House, Market Street, Newcastle-upon-Tyne. Tel: (0912) 617641.*

ROLAND S550
Sampling module

The S50 in a rack-mounting box? Whilst the S550 is indisputably the son of the S50, it boasts eight audio outs, filters stolen from the D50 and a few other tricks besides. Review by Chris Meyer.

WHEN THE FIRST wave of 12-bit samplers was being announced, the Roland S50 looked like being the winner of the "impressive specification" category. Unfortunately, custom chip problems delayed the release of the S50 for almost a year, and when it was finally released, many of the promised features were not implemented. Roland rectified this with the release of the S50's version 2.0 software, and succeeded in making people reconsider the S50 as a new, viable sampler. They also released a rack-mounted version with some worthwhile hardware upgrades – enter the S550.

The Breakdown

LIKE THE S50, the S550 boasts 16 voices (most samplers have eight) with sample rates of 30kHz and 15kHz (a touch on the low side, compared to its competitors). The back panel features eight individual outputs (a large improvement over the original S50) and a single mix output. Sample memory is double that of the S50, totalling 28.8 seconds at 30kHz (that works out to roughly 844 Ksamples, or 1.266 Mbytes given 12 bits per sample), divided into two blocks and two banks per block (thus limiting any one sample to 7.2 seconds at the highest rate). Unlike some other double memory upgrades (Prophet 2000, Emulator II and so on), all samples in all banks may be played at the same time – thankfully, there's no bank switching scheme. The operating system is stored on disk, and the system and sounds are saved using the familiar 3½" disk drive. It takes two disks to fully load the machine.

Thirty-two Tone locations are available in each bank of the S550. A Tone is Roland's parlance for a set of parameters (envelopes and the like) and a sample (or Wave). Different Tones can share the same Wave. There are 16 patches (key assignments) per block, yielding 64 tones and 32 patches overall. Up to eight patches may be played at the same time (on the same MIDI channel or different ones) making the machine nicely multitimbral. The catch is that the manual forewarns you of delays if too many patches are on the same MIDI channel (I heard some strumming when I got up to three – annoying for the delay, but the imprecision sounds more realistic if you can deal with it).

Each patch may be assigned an individual output and have its level set in the screen where the patches for playback are selected. Each Tone also has an output assignment (such as different drums going to different outs), and this can be invoked by selecting "T" in the output assignment screen (more on user interface shortly). Unlike some individual outputs that are monophonic, each one on the S550 is polyphonic, so mixing between different patches is no problem. Voice assignment modes include two variations on dynamic allocation (a free-for-all where whoever needs a voice gets one until all run out) known as Last Note Priority and First Note Priority along with Voice Fixed mode. The difference between the first two priority modes is whether old voices get stolen or new notes ignored if the demand exceeds 16. Voice Fixed mode allows a fixed number of voices to be assigned per patch. Instead of allowing you to decide exactly who gets how many as you would expect though, there are 22 different combinations of one to all eight patches getting 2-16 voices to choose from. You may have to juggle which patch appears where in the list of eight to get the assignments you want.

In this fixed mode, notes requested over and above the voices a patch has been assigned are ignored. Unfortunately, there's no combination that gives a patch just one voice for monophonic playback – you have to play tricks to force it. The same goes for having one wave cut off another (such as open and closed hi-hats) – you have to set up two waves on the same patch that each act as if they're taking up two voices, and give the patch two voices in the allocation scheme. These are minor gripes that'll buy me little sympathy, but I'm lazy – I hate having to be clever to do something I consider normal.

User Interface

ROLAND'S SAMPLERS ARE the first instruments at the reasonable end of the price scale to feature a CRT and mouse (or other advanced input device). As a matter of fact, one of the first notes you run across in the manual is "To operate the S550, a CRT display is necessary". Roland do not supply a CRT with the S50 or S550, nor do they sell one – you'll have to acquire a monochrome or RGB colour monitor yourself. In selecting a color monitor, pay *careful* attention to the specs provided in the back of the manual, and the specs of your prospective monitor – "RGB" is a blanket term for a group of widely incompatible standards, and you may get stung. I used an inexpensive monochrome monitor for my tests with only minor hassles (when something changes colour, it changes shades of grey – or green, in my case – on a plain monitor) and no compatibility problems.

The S550 comes supplied with a two-button mouse that connects to the front panel. An optional remote control panel is available (that the mouse plugs into), along with a graphics tablet. Upon powering up the S550, you must hold down a button on the front panel keypad to let it know what's connected – another minor hassle; I wish it could auto-sense it (for when you're bending over hitting your terminal strip, or power cuts out for a handful of milliseconds).

The screen operates a little bit differently to an Atari or Macintosh, but is easy to become familiar with. In reality this baby is far quicker to get around on than any cursor control, continuous rotary knob or LCD I've ever twiddled or peered into. My only lingering gripe is that the mouse doesn't have a pointer – you tell where it is by what highlights as you move it around. On the flipside, the mouse buttons work as inc/dec controls when you get there, which is a nice touch.

The obvious thing that this brings to mind is comparisons between this and other visual sample editors that are currently available. The S550 has some sound editing features built in, such as mixing, truncating, smoothing, crossfade looping, digital filtering, wave drawing and so on, that all work but don't have quite the power of dedicated software packages. The S550 has some nice features (such as keys or patch letters flashing as you're playing them) that make monitoring and troubleshooting in a MIDI setup that much easier. For extreme sample editing, a stand-alone package is still

better (Roland encourage development of such software), but having everything else onboard is a definite plus point for the S550.

No matter where you're editing it, though, making the user perform contortions like going back into Play mode to audition changes made in Edit mode is *not* nice. On the positive side is the fact that the operating system seems to reinitialise parameters in all the right places. A mixed blessing is making you save any new creation (after a mix, for example) in a new Wave location. It's a pain to then have to go back and reassign a Wave to a Tone, but this creates an automatic backup (and there's enough memory in this machine to deal with it) whenever there's a risk of damaging your work. Personally, I'd trade speed of operation for safety, but I'm told not everybody's as reckless as me.

As mentioned, the S550 uses a disk-based operating system. The ease with which these are updated is great (the unit I have has version 1.0 software; they're up to 1.1 now with additional features such as the ability to read from and write to S50 disks). However, machines that have to address the disk for some (Ensoniq EPS) or all (E-mu Emax) of their functions drive me crazy. In Roland's case, there's a separate Utilities disk that needs to be inserted into the drive whenever you want to sample or manipulate the sample. Personally I'd like enough memory onboard to hold the operating system – which is available in the form of the HDIF interface for use with the Macintosh hard disk.

Filtering

ONE OF THE most significant features missing from the S50 that were added to the S550 were Time Variant Filters (also found on the D50). Again speaking personally, I don't consider a sampler to be an "instrument" unless I can modify the timbre in real time – it's just a digital tape deck otherwise. In spite of this, however, it is nice to have variable digital filters. The filter is of the low-pass variety with resonance, and includes the eight-point and slope envelopes that accompanied amplitude and pitch on the S50 (and yes, you can edit them with a mouse – this is where graphics come in *really* handy). On top of all this, the filters sound rather good.

Another point that needs applauding is the sample mode that is always filling memory, and allows you to say "keep everything *before* I hit this button" – great for catching things on the fly. This can be used as a pre-sample buffer for making sure the starts of samples don't get cut off.

Verdict

THE BOTTOM LINE is this: the Roland S550 is a very solid sampler. It has a couple of quirks, but nothing that really detracts from it. Having a mouse and CRT to control the machine bumps up the price and development time a bit, but it results in a machine that's a lot quicker to use. I think I'd be safe in saying that some of the S550's features will set standards that other serious samplers will have to match. ■

Prices *S550 £2300; RC100 remote control, £250; HD1F (interface for Macintosh hard disk) £195. All prices include VAT*
More from *Roland (UK) Ltd, Great West Trading Estate, 983 Great West Road, Brentford, Middx TW8 9DN. Tel: 01-568 4578*

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SHAPING THE

Illustration *Toby Goodyer*

WAVE

We're living in the age of the digital synth – but lurking beneath the casing of many popular digital synths is a disguised, familiar method of sound generation: analogue synthesis. *Text by Lorenz Rychner.*

THE SALESMAN ASSURED you it was digital. The ad said it was FM, or LA, or PD, or VS or something. The owner's manual lists features like TVA, TVF, MG, DCW. If you grew up in the days of VCOs, VCFs, VCAs, ADSRs and LFOs you're looking in vain for old friends. If it's your first keyboard, you're sticking to factory sounds. Who has the time to learn all these different programming techniques – and you can always buy more sounds on cartridges, so why bother?

Then again, it would be nice to make your own sounds. You've seen books on analogue programming but isn't analogue supposed to be dead, replaced by digital? And your synth is digital, that's why you bought it in the first place. What's going on?

I'll tell you: analogue (or subtractive) synthesis is alive and well. Don't send flowers, it's doing just fine. Unless your only keyboard is a Yamaha DX instrument, analogue programming is an integral part of your synth no matter how digital it's supposed to be.

Actually, there is one thing wrong with today's analogue: its name. "Analogue" simply means that the sound signal is at all times represented by a voltage, but that's not what happens on today's synthesisers and samplers. They're all computers, and they treat the sound signal as a set of numbers that are ultimately converted into an analogue signal that an amplifier can boost and send to the speakers. So technically speaking, analogue synthesisers are a thing of the past. We're actually dealing with analogue/digital hybrids – synthesisers that work partly with analogue signals and partly with a digitised version.

What about samplers? Aren't they totally digital? Does "analogue programming" apply there, too? You bet. Once the samples have been recorded and digitally processed, they need to be treated with good old analogue processes before they become musically useful. These processes may be hiding behind unfamiliar names, but they're analogue processes all the same. Even an instrument like E-mu's new Emulator III – they call it a Digital Sound Production System – has analogue written on its front panel.

Programming

"ANALOGUE PROGRAMMING" IS still the technique you need to control your digital instrument. And it hasn't changed all that much since the days when all synthesisers were truly analogue. As I said, the main problem is the name. To make their instruments appear more advanced some manufacturers have come up with new names for features that were around when Hammer was a tool and Miami had no vice. Time Variant Filter (TVF) and Modulation Generator (MG) may look strange, but they aren't that hard to figure out once you realise that they're comparable to a VCF and an LFO.

There are fundamental differences between analogue and digital sound generation. Analogue sounds traditionally have a warmth that is often missing from digital sounds. But there are many advantages to using digital technology: stable tuning, program recall, large selections of oscillator waveforms, complex envelope generators, the entire sampling process, onboard signal processors, MIDI . . . These facilities wouldn't be available if it wasn't for the bits and bytes in your instrument's computer chips. Not to mention the effect digital technology has had on instrument prices.

Does this mean that you have to learn computer programming? No, just about *sound*.

Oscillators

ALL SOUNDS CONSIST of three basic elements: timbre, pitch and amplitude. To begin the programming process you first need to select a basic sound source from the oscillator, which produces the sound. Your first choice is the waveform, which will determine the sound's timbre, and your second choice is the waveform's tuning, which determines its pitch.

The waveform puts your sound into certain broad categories, according to its characteristics. Traditionally you could select from three or four waveforms: sawtooth (or ramp), pulse, triangle and sine. A pulse wave is a square wave that is modulated to alter the pulse width, hence pulse width modulation or PWM. None of these waveforms bear more than a passing resemblance to any "real" sounds or instruments – until you modify them. Great sounds are still being made using these basic waveforms, whether they are supplied by VCOs (Voltage Controlled Oscillators) or by DCOs (Digitally Controlled Oscillators).

How has digital technology helped in this area? Digital memory has become cheap, and cheap storage of large amounts of data has made cheap synths powerful or expensive synths very powerful – it depends on your point of view.

This mix-n-match approach to waveforms can produce rich timbres on synths with more than one oscillator. Sequential went a step further with Vector Synthesis, where you can combine waveforms with a joystick, literally stirring them up until the mixture is just right. Roland took this to the extreme with their D50, where a Patch can be a layer of ▶

▶two Tones, and each Tone is a blend of two Partials. "Partials" here refers to 100 samples permanently resident in the D50. These samples can be treated as if they were simple waveforms – or you can choose to use sawtooth or pulse waves. Suddenly we're back to basics.

The sawtooth is the brightest of the basic waveforms. It lends itself to the synthesis of brass and string sounds, as well as many other sounds that require a colourful, gutsy waveform. What makes it sound like that? Two things give the sawtooth its harmonic spectrum and hence, its sound. Firstly it contains all of nature's harmonics (overtones) and secondly, the loudness of the harmonics compared to that of the fundamental follows a fractional formula: the amplitude of any harmonic is the reciprocal of the number of that harmonic. For example, the fifth harmonic is a fifth as loud as the fundamental.

"Analogue programming is still the technique you need to control your digital instrument. And it hasn't changed since the days when all synthesisers were truly analogue."

The pulse wave is less easily defined. Its sound colour depends on the width of the pulse. The pulse wave has no up or down slope, it's either positive (on) or negative (off). The pulse width (duty cycle) describes the ratio of the positive to negative parts of the cycle. If that ratio is equal (50/50 or 50%), the pulse is called a square wave and it contains only odd numbered harmonics. Their loudness follows the same reciprocal formula as the sawtooth. When square, this wave sounds similar to a clarinet in its lower register, slightly woody and hollow, but well rounded. The more the pulse width changes away from 50%, the more the sound becomes nasal, piercing and bright, similar to double reed instruments and twangy strings (oboes and harpsichords).

The triangle wave is a more bland version of the square wave. It also contains the odd numbered harmonics, but they are much weaker. Their loudness is inversely proportional to the fundamental: the third harmonic is a ninth as loud, the fifth harmonic is 1/25 as loud . . . Not much colour there.

The sine wave is the simplest of all waveforms. A pure sine wave has no overtones. Its timbre is musically of little use. But because it is nature's building block of sound, and because computers have no trouble crunching massive amounts of numbers, there are affordable synthesisers that allow you to construct your own waveforms with sine waves. You combine them using an additive process – hence it's called *additive* synthesis – to produce the harmonic series of the waveform you require. The computer then produces the desired timbre from this combination of sine waves. Kawai's K3, Korg's DSS1 and DSM1 all offer this facility while Kawai's K5 goes one step further, with four separate envelopes controlling the appearance and disappearance of selectable groups of waves. Not long ago this could only be done on equipment in the Fairlight league. Now it's here for everyone, and you can load up the oscillators with your own creations.

Tuning and Pitch

SINCE THE "V" (for voltage) has become a "D" (for digital) in VCOs/DCOs, we don't have to worry about tuning problems due to fluctuations in mains voltage, heat, and some less explicable causes. The instability of analogue oscillators is a thing of the past.

All pitch control has to happen at the oscillators. The keyboard talks to the oscillators for pitch selection. So does the LFO when its job is that of creating pitch modulation, and so do other programmable features that can control the pitch, like Auto Bend, or Pitch Envelope Generators. As you play, you may have further pitch control available in real time, from Pitch Bias via keyboard velocity or aftertouch, and from the pitch-bend wheel or joystick. Portamento (or glide, as Moog had it) connects the played pitches in a smooth, gliding manner, and

its speed can be adjusted. Beware of parameters that say something like "Porta Time" when it's really a rate of speed rather than a fixed amount of time. If the distance between two adjacent notes is covered in the same amount of time as the distance over several octaves, then it is truly a Time parameter (as on the OSCar). But if the time varies with the pitch distance, then you're dealing with a Rate.

The oscillators themselves can be set to one of several octave ranges that are sometimes listed as 16, 8, 4, with an occasional 32 or 2. These numbers are taken from pipe organ terminology where the physical length (in feet) of the organ pipe determines pitch range. Further tuning is usually available in halfsteps, on at least one of the oscillators on synths with multiple oscillators. By using this capability you can set up constant intervals between oscillators. A facility to slightly detune the oscillators from each other can be used to create oscillator beating, to fatten a sound or turn the sound of a solo instrument into that of an instrument section.

Cross modulation, where one oscillator's waveform imposes its frequency on the waveform of another oscillator, has always been a source of new and often amazing timbres. When combined with Auto Bend, this feature creates sweeping changes in timbre that are hard to describe but easy to love. Digital memory allows very precise programming of such effects, because the tuning of the contributing oscillators is memorised more accurately than on analogue equipment.

Whether it's called FM through cross-modulation as on the Korg DS8, or ring modulation as on the D50, or simply oscillator sync or hard sync, try it on your synth. It may get you the metallic sounds that the DX7 has become famous for.

Filters

ONCE YOU'VE SELECTED and tuned your oscillator's waveforms, the fun starts in earnest. Whatever the timbre is that you've come up with, you'll want to modify it. At least one, possibly several filters let you do just that. The main filter goes under many names, but it always acts as a low-pass filter (LPF). You'll hardly ever see this name, but it says more about what the filter really does to the waveform than any of the names you see on today's instruments: VCF (Voltage Controlled Filter) on the majority of synths; DCW (Digitally Controlled Waveform) on Casio CZ synths; TVF (Time Variable Filter) on Roland's D50 and MT32.

The LPF works in a subtractive manner. It can't add overtones to the waveforms from the oscillators, but it can remove them. It does that "from the top down". When the filter is fully open, all overtones pass unaltered. As soon as the filter starts to close down, the highest overtones are eliminated. The more the filter closes, the fewer high overtones pass, until the filter closes completely, by which time even the lowest overtones and eventually the fundamental are blocked. No more waveform: no more sound.

The parameter that lets you open or close the filter may be called Cutoff, Frequency, Fc or something similar. Frequencies higher than the cutoff frequency will be eliminated, while lower ones will pass through the filter. But the term cutoff is misleading, because the eliminated frequencies are faded out or rolled off rather than cut.

Let's assume that you've picked a nice, fat waveform and you play and hold the middle C key. If your oscillator waveform is tuned to the 8′ octave range and the keyboard is in its normal transposition range, you hear the pitch of middle C. If you find the sound too bright, you adjust the filter's frequency cutoff by ear.

"Analogue sounds have a warmth often missing from digital sounds – but there are advantages to digital technology: stable tuning, program recall, onboard signal processors . . ."

Let's assume that the cutoff falls at 1000Hz, which happens to be just a hair below high C two octaves above middle C. Does this mean that you don't hear the ▶

► frequency of the fourth harmonic, in this case 1046Hz, any longer? If the cutoff were a true cutoff, then the answer would be yes, but no filter acts this sharply so you still hear it a bit. In fact, you still hear frequencies as far as one octave away from the cutoff point.

The fade of overtones above the cutoff point is gradual, and the curve can be adjusted on many synths. If you see a switch for 2-pole/4-pole selection, alternate between the two and see if you can hear the difference. A pole is a measurement of attenuation by 6dB per octave. Without getting involved in mathematical formulae, think of it this way: the 2-pole setting causes frequencies that are one octave higher than the cutoff point to be softer by 12dB than the frequencies at the cutoff point. With a 4-pole setting, this changes to 24dB. In practice, you'll always judge the effect by ear, but it's nice to know what to expect. String ensemble and other lush sounds tend to sound better with a 2-pole setting, whereas sounds that need extra bite work best with the 4-pole setting.

"Digital memory has become cheap, and cheap storage of large amounts of data has made cheap synths powerful or expensive synths very powerful – depending on your point of view."

While most VCFs eliminate all sound, overtones plus fundamental, when their cutoff point is low, there are several filters that only remove the overtones, leaving a sine wave at the lowest cutoff value. Korg's DS8 and the Casio CZ series of synths come to mind.

Next to the cutoff parameter you have a control called Resonance, Emphasis, Regeneration, Feedback or simply Q. This is a specialised loudness regulator that affects only a small portion of the overtones of your waveform. It concentrates on the frequencies at the cutoff point. In the example above, a high amount of Resonance would make the frequencies around 1000Hz a lot louder than they normally are in this waveform when compared to the fundamental's loudness. This gives a biting edge to your sound. If you leave the Resonance at a high value and you adjust the cutoff point up and down, you'll hear individual harmonics stand out as individual pitches.

On most synths, a maximum value of Resonance over-emphasises the frequencies at the cutoff point, and the filter self-oscillates on those frequencies. You hear a sine wave that may not follow the pitches from the keyboard the way you expect. If you adjust the values for the parameter that is called Keyboard Track, or Key Follow, you'll get microtonal scales. The filter is now acting as the sound source, and the cutoff point determines the tuning. Consequently, Keyboard Track is the only link between the filter and the keyboard.

Keyboard Filter Tracking is used to adjust the brightness changes across the whole keyboard. It acts by adjusting the cutoff point relative to the keyboard range. As a rule of thumb, give it a medium value when you start on a sound. Play your sound-in-progress at both ends of the keyboard and adjust the value by ear.

Programmable Cutoff

MOST OF YOUR sounds will need to undergo changes in brightness during every note you play. But you can't make music with one hand on a data entry slider or increment/decrement button. You need something that will make those changes predictably and automatically each time you strike a key. For this you have the Filter Envelope and the LFO.

Envelope Generators have come a long way from the classic ADSR but no matter what your Filter Envelope looks like, you need to program the amount of change that's going to occur to the cutoff point during every note you play. For this you have a parameter called Envelope Amount, ENV, EG Depth Level or something similar. The higher the value, the further the cutoff travels from the value that you gave it with the Cutoff parameter. But there comes a point of overkill. If your cutoff is set to a very high value, and you assign a very high Envelope Amount, then you're asking the Envelope to open the filter wider than is possible. Depending on the design of your synth, either the filter opens fully, for which it would only need a small Envelope Amount and it ignores the rest of the Envelope's exaggerated message, or the filter opens fully and uses the extra Envelope Amount as a timing instruction, by staying fully open for a longer time than the rates in the envelope suggest. This can be confusing when you've set a fast decay rate to reach a low sustain level quickly and the filter cutoff stays up there, seemingly forever.

On most synths you have a choice about the direction in which the cutoff point travels when you play a note. Normally the cutoff point rises during the attack then falls during the decay. This is termed positive polarity. The alternative is negative polarity, which is achieved by inverting the filter envelope.

The LFO (Low Frequency Oscillator) simply shifts the cutoff point up and down in a regular pattern, from wherever the cutoff happens to be. If the Envelope moves the cutoff point, then the LFO follows the new point.

You may have more control over the cutoff point available as you play from other modulation sources. Keyboard velocity, aftertouch, pedals, mod wheels and joysticks let you modify the cutoff point, the envelope amount, the envelope timings, and the amount of LFO influence over the cutoff point. This is an area where fast-acting computers can help your musical expression. But when it comes to the sound itself, the digital technology hasn't had the same impact on filters as it had on oscillators.

Many synths have another filter called either a High-Pass Filter (or HPF) or a Low-Cut Filter. On most synths it acts as a static tone control for the bass, attenuating some of the lower frequencies as you raise its cutoff point. It's normally used to thin synth sounds that otherwise tend to clog the lower frequency band of a mix – because the filter is letting all the lower frequency components of the synth sounds through.

VCAs

WHATEVER'S LEFT OF your waveform after it has passed the filter section must now be programmed for maximum volume, and for changes in volume during the duration of a note. The maximum volume for any sound is set with the VCA Level. This is important – don't just set it at maximum for every sound. If you have soft sounds or heavily filtered waveforms in some sounds, and loud and aggressive sounds in others, you'll get wildly differing volume levels when you change patches. Recording engineers and input stages of mixing desks respond very badly to unexpected changes in level.

For predictable changes in loudness use the VCA Envelope Generator. It takes care of the speed at which the loudness rises when you first strike a key, and, depending on the envelope's design, can allow several programmed changes until the loudness returns to zero after you release the key.

The LFO, when assigned to the VCA, can raise and lower the volume in its repetitious manner. It follows the changes in loudness level that the VCA EG causes. More control over the loudness is available as you play – Keyboard velocity, aftertouch, pedals, mod wheels and joysticks let you change the VCA Level, the envelope timings and the amount of LFO influence on the loudness.

Digital Luxuries

A FEW TRENDSETTING instruments incorporate digital sound processors that are normally found only as outboard gear. Yamaha (TX81Z), Korg (DSSI, DS8) and Roland (D50, MT32) instruments let you program echo, delay, reverb and equalisation effects, and they are sure to be followed by others. Programmable output assignment and stereo panning is another luxury that is bound to become standard. Let's not forget MIDI, with its possibilities for remote programming and patch alterations via system exclusive. To be able to virtually re-program a sound while the synth is producing music under the command of a sequencer is more than useful.

So whether your keyboard uses FM, LA, PD, VS or even sampling, a good working knowledge of analogue synth programming helps you to get your money's worth. Go for it. ■

Fright of the Bumble Bee

Inside every Atari ST computer, there's a bumble bee waiting to get to work for you. Now and again, you'll see him buzzing across your monitor screen letting you know that he's on the case.

The team at Steinberg thought the little fella ought to be put to work even harder and asked him to do things he'd never attempted before inside PRO-24. He was used to being asked to do extra things now and again, with updates being a regular occurrence at Steinberg, but suddenly PRO-24 III had arrived, and things were really buzzing . . .

Creative changes had to be made 'on-the-fly' (excuse pun) while recording or playing back, together with a more logical user-interface and a vastly expanded range of utilities. Whilst III was obviously easier to use and performed better than ever before, life was getting tough for our little busy bee.

PRO-TWENTY FOUR III. Features include:
MULTI-RECORDING: Up to four tracks can be recorded simultaneously with independent quantization and cycle modes.
DRUM EDIT: PRO-24 III can now behave like a drum machine, enabling up to 32 instruments to be recorded on one track both in real and step time. Advanced functions and graphics make this page vital in the creation and configuration of drum tracks.
QUANTIZE: All quantizing facilities are now available from the front page, and during recording.
COPY: New "click-and-drag" copy routines accessible from the front page.
FREE-COPY: Free-copy allows you to copy 'true-to-tape' without worrying about pattern or track configuration.
TEXT EDITOR: You can now add and store comments to your song.
REMOTE CONTROL: Control all main functions directly from your master keyboard.
CONTROLLER MAP: Transforms controllers (e.g. mod. wheel to volume) in both record and thru modes.
UNDO: Lets you undo just about anything you do!
GRID EDIT: New fast-edit routines for this innovative "industry-standard" editing system.
LOGICAL EDIT: Position now becomes a Logical Edit criteria. Thus you can specify, say, accents to certain positions throughout a pattern. Quantization is also now available as a Logical Edit operator.
SCORE EDIT: New routines enable individual patterns to be effortlessly printed using standard music notation.
STANDARD MIDI FILE: PRO-24 III can write and read the standard MIDI file song format, making PRO-24 fully compatible with existing MIDI utilities.

Steinberg

"What will they think of next?" he mused. Then the thought of IV loomed ominously in his mind, and that became . . . the fright of the bumble bee.

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Photography *Tim Goodyer*

THE DOLBY SYSTEM

Pioneer solo performer, eccentric cult pop star, technical boffin – Thomas Dolby has worn all these hats, yet he remains best described simply as Thomas Dolby. Interview by Tim Goodyer.

I'm sick of the TV
And I'm sick of the radio
And I'm sick of my Fairlight
So what do I do?
I get a new toy . . .

IT'S SEVEN YEARS since Lene Lovich made Thomas Dolby's 'New Toy' a UK chart hit. Seven years since Dolby was a little-known member of a little-known band called Bruce Woolley and the Camera Club. In the intervening seven years Dolby has built a successful solo career, released two albums which have earned the unanimous respect of musicians and fans alike, and produced records and "guested" on keyboards for acts as varied as Foreigner and Prefab Sprout. A couple of years ago he left Britain to take up residence in Los Angeles.

Right now Dolby is back in Britain promoting a new album, *Aliens Ate My Buick*, a new single 'Airhead', and touring with a new all-American band, The Lost Toy People. Toys again. Tell me about your childhood, Thomas.

"When I was a kid there were periods of intense boredom which I had to fight my way out of with any available means", he replies after an extended pause for thought. "Very often that meant a hand-me-down from one of my older brothers or sisters, an old Meccano set or something.

"I'm a real dabbler. I'm a dabbler in all sorts of things I would never take the time to master. I mean, I know nothing about computer programming but I have a Macintosh that I do a lot of stuff with. I religiously don't read instruction manuals. I think life's too short to sit there with an instruction manual on your knee. I'd rather just switch on and go – that's what I liked about the Macintosh initially: it *is* a toy, an idiot can turn it on and click a few icons open and do something fun with it. I dabble in video editing and I dabble in camera work . . . And I have a short attention span, so I need a constant diet of new toys to keep me interested."

Thomas Dolby – real name Thomas Robertson – earned his stage name as a nickname at school, where he had a reputation for "playing" with tape recorders and keyboards. Dolby Laboratories (of Dolby Noise Reduction fame) objected and lost. The name remains.

Dolby's toybox still contains the Transcendent 2000 synthesiser that began his collection of musical diversions.

"That didn't work very well", recalls Dolby. "It was a kit that somebody else made that I bought, and it didn't work very well at all."

The Transcendent was soon joined by a Moog Micromoog, a Crumar string synthesiser, a Fender Rhodes, a Roland Jupiter 4, an early PPG system (with which he performed his original solo concerts), a PPG Wave 2.2 (a gift from PPG because the original instrument was so unreliable), a Jupiter 8, a Fairlight Series II and a Fairlight Series III. And with the exception of the Rhodes, they all still play their part in keeping Dolby's boredom at bay.

"I would never say I'm going to junk all that stuff", he explains, "I've never sold or got rid of any keyboards with the exception of the Fender Rhodes which I always hated anyway.

"It's a question of horses for courses; there are some things that I'd still use the older

keyboards for. For example, the sound of a Solina string synth was never really duplicated by anything else. For a certain kind of string sound it's the only thing to use. The sound of a Moog has never been duplicated either, in fact the bass sounds on 'Airhead' are a Minimoog MIDI'd up to a Fairlight sequence. I knew that was the only instrument that would really give me the sound I was after. I often come back to the PPG I use because I've never really come to grips with it. The machine is a complete enigma. I don't know if anybody outside of a small factory in Frankfurt really understands the thing. Consequently, when I go to it, I'll always be sidetracked, I'll always be drawn off at a tangent and I'll come up with something interesting for that reason. Whereas, if I use a Roland keyboard, I know exactly what I'm doing from the word go.

"The main thing is, I get bored very quickly if I stick with things that are tried and tested, so it's more fun to use something that I'm unfamiliar with – whether it's an instrument, a studio or a musician."

THE UNFAMILIAR elements currently contributing to Dolby's particular brand of intellectual pop music are the musicians that make up The Lost Toy People. They were recruited through an advert placed in *The Recycler* (an American *Exchange & Mart*), the intention being to find musicians with genuine enthusiasm for their craft rather than the seasoned professionals likely to respond to an ad in a "musicians' magazine". Listening to Dolby talk about the band it's obvious the experiment has been a success. But why has he abandoned the one-man show he pioneered with his temperamental PPG computer?

"I'm always doing U-turns. The fact that I've gone back to working with a band and working very low-tech is a reaction to the fact that everything I hear on the radio seems to be a couple of guys working in a room with the 'hip box' of the moment.

"When I started out it was a relatively new concept. It was partly out of necessity for me because punk bands wouldn't let me join in 1977 because I knew too many chords. Instead I sat in my bedroom with a Revox and a Micromoog and built everything up myself. In the process I learnt to arrange entire songs myself.

"I was a kind of prototype for the Pet Shop Boys and people like that – a singer and a programming wizard. At the time it was very fresh. Now, to keep that sort of freshness, I feel I've got to get away from all of that.

"I feel very sorry for Kraftwerk who started the entire electronic dance thing. They were the inspiration for the whole glut of hip hop records and stuff like that. And they had to come back and be hailed as the masters of that genre and yet work with the same technology as everybody else. They had to come up with something that was going to be scrutinised and if it wasn't a landmark then it was a failure. That's a lot of pressure to be under.

"It's fortunate that I am able to redefine myself. People would be very surprised if Kraftwerk started using real drum kits and real brass – it's very specific what they do, other stuff is out of bounds. Whereas I've always had these different tangents to what I do and it's always been OK for me to use a band. I'm very lucky in that respect."

Aliens Ate My Buick bears the signs of an LP made by "a band" alongside Dolby's own trademarks. The songs are unmistakable examples of Dolby's ingenious pop; familiar ingredients are cunningly reworked into unfamiliar forms, the lyrics astute observations on people, their lives and their society. *Aliens Ate My Buick* makes no apologies for itself or its lyrical content – by far the most brash Dolby the world has heard. But the slower numbers that graced both *The Golden Age of Wireless* or *The Flat Earth* are missing – the only reminder of the introspective side of Thomas Dolby is 'Budapest By Blimp'. Also, uncharacteristically for Dolby, all the material was gigged before it was recorded.

"We went out and played clubs with the songs when I first wrote them", he recalls, "but then I went into the studio and worked on them for a few months. I kind of became accustomed to the way they'd evolved and it became hard for me to hear them the way they were before. But what's on the album is pretty much what we play live now. I wanted to get the ultimate performance – I hated the idea that maybe three nights ago at the *Club Lingerie* we did a better version of the song than we did on the album. Over the course of several days I recorded various different takes of each song and then I used the Fairlight Series III to compile the highlights of each take. Everything was recorded to a click so I could take my favourite bass take and my favourite drum fill and so on. And I changed the structures of the songs – like, some are groove-based and I'd find that there were four bars too many somewhere but rather than just edit them out on tape, I'd reassemble things. So on the album there are a lot of very long Fairlight samples, maybe up to 20 or 30 seconds, that have been juggled around.

"The bass on 'Airhead' is a Minimoog MIDI'd up to a Fairlight sequence – that was the only instrument that would really give me the sound I was after."

"The principle was to get the best of both worlds: to have the freedom to manipulate the sounds and the structure of the songs that you get from sequencing, but at the same time to have the freshness and the liveness of a musician playing a part.

"On the album, 'The Key to Her Ferrari', 'Airhead' and 'Hot Sauce' were all played with a live drummer and bass player; 'Pulp Culture', 'My Brain is Like a Sieve', 'The Ability to Swing' and 'Budapest by Blimp' are a combination of sequenced drums and live drums. It's sometimes quite hard to get a drummer to play with the same feeling you have on a drum sequence, especially with the Fairlight where it's possible to move the placement of a sound forwards or backwards in a bar or in a beat. Take the groove of 'Pulp Culture', I've got a lot of rhythmic elements in there: a bass part, bass drum, hi-hat, shaker and a snare drum, and to get the groove exactly the way I wanted it meant that I'd got to juggle for days. I'd do a little bit, save it, go off and watch TV for a while, then I'd come back and hit Play and think 'maybe the hi-hat could come back a bit more . . .'. It really took a lot of tweaking to get that feel the way I wanted it, and when we then went back into rehearsal, and I was asking the drummer to play it the way I'd become accustomed to it. It's very hard to say 'I think your hi-hat needs to be a bit more laidback and your snare needs to be a bit ahead'. It's hard to ▶

►get a drummer to relax and concentrate at the same time."

WHILE DOLBY'S FAIRLIGHT was an important part of recording *Aliens . . .*, it no longer appears onstage with him. It seems the technical sophistication of his solo tour with the PPG and the synced visuals of *The Flat Earth* tour have been put aside – at least temporarily. Instead, Dolby relies on a remote controller and a modestly-furnished rack of gear.

"There are three sound sources", he explains. "There's an Akai S900 which has samples transferred from the Fairlight Series III, a Roland Super Jupiter and a Roland MKS20 piano module. All of those go into an Akai MIDI mixer and through two effects: a Yamaha SPX90 and an Alesis Midifex. They're all mapped by a Cooper Electronics MIDI Link, and I play them from a KX5 slung round my neck and a couple of Yamaha pedals. They put out program numbers to the MIDI link and that sends out separate program numbers to everything else. In other words I'll build up an entire patch with sound sources, a mix, effects and a stereo output, and store it. Then, when I send one program number into it from either the keyboard or from the pedal, it'll send the appropriate numbers out.

"Punk bands wouldn't let me join because I knew too many chords so I sat in my bedroom with a Revox and a Micromoog and did everything myself."

"It's a lot of homework beforehand, although I've found during rehearsal that I can treat the whole thing as a manual setup; when we're running over things again and again I can tweak things as I go and keep storing them all the way down the line and keep notes on anything that needs attention. Then maybe on my own the next day I'll fine tune things."

His move across the Atlantic to LA seems to have turned Dolby's studied eccentricity into brash confidence.

"It's unhealthy sitting in studios for three months at a stretch. If I could make an album in a day, I'd be perfectly happy. I don't really enjoy the process of it for the sake of it, it's often very painful. Although having said that, this album was a lot less painful than either of the previous ones – I think, because I'm that much more secure about myself as a performer and an entertainer than I used to be."

Surely the man who took to the stage with his music and his computer in the early '80s must have had a fair amount of confidence.

"No, I didn't, no I didn't", protests the performer, "I was terrified."

Then a band to help share the attention and the responsibility for the songs would seem the ideal solution.

"Well, that's kind of easier said than done. I didn't know anybody that could do it. At that stage I'd invented my music in a bedsitter and the way I heard it was the way I programmed it. It wouldn't have been the same to have got other musicians to do it."

But Dolby did enlist the help of other

musicians, culminating in *The Flat Earth* tour in 1984.

"I had a bunch of musicians who were playing everything live, but at the same time, because we had in-sync video and sequences on a couple of songs, we weren't very flexible. We had to do the same set every night and we couldn't vary the tempo – according to the atmosphere on any night, a song might feel too slow or too fast, there's no perfect tempo. The band that I have now is very low-tech. Every time we play a song it's a slightly different length or structure or a solo will continue for an extra eight bars . . . It's all live, definitely, very much live. So there's really a lot more flexibility."

ALTHOUGH OBVIOUSLY suffering from the effects of jet-lag, Dolby exudes an air of quiet satisfaction over *Aliens Ate My Buick*. If his attitudes haven't changed from the early days of *The Golden Age of Wireless*, then his practices have. To me, the gap between *The Golden Age of Wireless* and *The Flat Earth* is greater than that between *The Flat Earth* and *Aliens Ate My Buick*. They share implied, rather than stated, chord progressions; they've replaced innovative commerciality with a certain sophistication. Apparently my opinion is not shared by the other journalists Dolby has spoken to. And then there's the man in the street . . .

"I think the man in the street, not to insult him, picks up on the spirit on a record. He treats it like a stranger, and I think the stranger you meet on the first two albums you spy on through a keyhole – like a voyeur into another world. I think on this album he's talking in your ear. It's like a stranger who is uncomfortably familiar with you. I think it was a bit shocking to English people in America. Americans are very up-front, English people spend time talking about the weather before they start talking about anything personal, whereas the Americans will come right out with it. Usually that makes English people uncomfortable and maybe the same thing will happen with this record."

It may make Britons abroad uncomfortable but, as the comments made on *Aliens* . . . mainly relate to American culture, there may be more sympathy for Dolby's observations than he suspects. But then I suspect the majority of non-American listeners will miss the humour of his words. How will the musician gauge his success?

"As an artist, you just have to assume that if you make a piece of music you like, there are enough people with taste in common with you that a lot of other people will like it as well. That's the only way you can go, I don't think you can use the yardstick of radio play or chart success or critical acclaim. I don't think you can allow yourself to be swayed by those things, you just have to make music you like. The only chance you have of any kind of success with music is by making music that you personally like and hoping that somewhere in the world there'll be somebody with the same taste."

But peoples' tastes are constantly changing. How much has Dolby's own taste changed since he began writing songs – does he even like his early material any more?

"Yeah, in varying degrees. I think on occasions I've just flexed a muscle without really feeling what I did but I definitely liked everything at the time. I'm proud of everything, and there's nothing I hate, but I have very high standards. I would never release anything unless I felt it was good enough. It's a very different approach to somebody like Prince who has, I suppose, the arrogance to believe that his every utterance is brilliant. A percentage of the time he's right, it *is* brilliant, but he doesn't set standards for himself. But then, this is a man who's released five albums and done a couple of tours and a feature film since I released *The Flat Earth*.

"There are different approaches to the same thing. He's *brutal* with his songs, that's the only way I can describe it. Sometimes he just misses, he makes records that could potentially have been much better songs, and some of his songs are much better in my head than they are on record – I get a real longing to hear 'Condition of the Heart' and when I do I'm disappointed by it. In my imagination it's a real classic."

"As an artist, you have to assume that if you make a piece of music you like, there are enough people with taste in common that will like it as well."

Thomas Dolby has already done cover versions of songs written by Joni Mitchell, Dan Hicks and George Clinton. Time for a Prince cover?

"That might be a but audacious. I wish he's cover one of mine. I wonder what song he'd do . . . Prince doing 'Urges'?"

Dolby's return visit to British shores seems all too brief. Even given his nomadic childhood, it looked as if he had found his home in Britain where his eccentric image seemed most appropriate. But now he's deserted bustling London for laidback LA.

"I haven't deserted anybody – and there's no saying I won't be back. I just happen to be there at the moment, and I'm enjoying it. I've learned over the years to make my home inside myself, wherever I happen to be geographically. LA's a good place to be at this point in time, it seems to me, because there's a lull in energy in the world's capitals. LA, which wasn't a cultural capital, is taking the opportunity to catch up – that means new clubs, lots of studios, lots of bands . . . There's definitely a healthy atmosphere – and not just for music. There's a lot more crossover between music and films now. Movie executives are realising that there are people in music that they need to chew up and spit out so they can absorb their energy. So a lot of interesting people, like Malcolm McLaren, who used to turn their noses up at LA are finding their way there now that it's seen the error of its ways. Although I don't know how long it'll last.

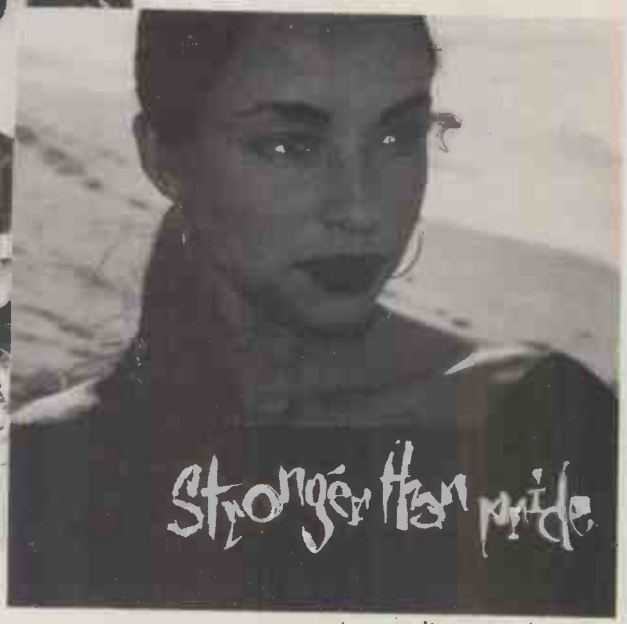
"In the mid-'70s music was disappearing up its own backside until Malcolm and Co came along and said 'it doesn't have to be this way'. My own feeling is that something like that won't happen again because rock 'n' roll is an ageing medium and it's very hard to be subversive in it any more. If you want to be subversive it'd be better to make a film because there are a lot more sacred cows on a cinematic level. If you really want to do some damage, that's where you should do it."

It begins to sound as if Dolby is forecasting the death of popular music.

"I wouldn't say it's the end of its life span, it'll take its place as one of the traditional forms of music. There'll always be some club in town where you can go and see a rock 'n' roll band. If the Rolling Stones can do it when they're 45, why not when they're 65?"

And why not Thomas Dolby when he's 65? ■

vinylT·A·K·E·S



Prince
Lovesexy
Paisley Park/WEA LP

This is not Prince at his best – I'll let you into that secret for nuttin', since every review you read from henceforth will tell you anyway. There's no doubt we're talking two trees short of a full forest here. Of ten tracks: 'Eye No' and 'Positivity' are average, 'Glam Slam' is cringeworthy: 'Anna Stesia' is downright embarrassingly excruciating. Musically, it's not as inventive as *Sign O' The Times*: lyrically, it's not as lewd as *Black*.

So what.

Prince may be the most significant black artist of the '80s, one who has begged, borrowed and stolen from every Clinton, Brown, Jackson and Stone to produce a musical dressing-up box which is uniquely his and his alone, but he isn't God – not yet, anyway. If he was, he'd have that necessary objectivity which at the moment is the one thing which is distinctly absent from the act. Quite simply, there's no quality control at Paisley Park. It works, it doesn't work: either way, it still gets released.

In the meantime though, while *Lovesexy* may lack a sense of overall coherence, in terms of plain good ideas, there are still enough here for anyone attempting life at normal walking pace to fill two or three albums. The best collection of moments are 'Alphabet Street' 'LoveSexy' and 'When 2 R In Love', though the crowning glory really has to be 'Dance On' with its imitation Mitch Mitchell drum programming, menacing bassline and doomy lyrics.

It's like this: Prince is a man who composes a song before breakfast and an album after. Occasionally, you just have to accept that somewhere in between he's eaten a large bowl of All Bran. ■ *Nicholas Rowland*

Prefab Sprout
From Langley Park to Memphis
Kitchenware/CBS LP

Like their name, Prefab Sprout shouldn't really exist. The leather headed Bizz of the late '80s has no place for men who wear embroidered waistcoats and hang about with a girl called Wendy who has a frog fixation. Yet here we are staring popular opinion in the face: "every critics favourite favourites".

Whimsy has always been Prefab Sprout's big selling point. They shoot videos with huge hotdogs and frogs (that damn Wendy again) dancing in the background; they give their albums old-fashioned titles like *Swoon*. Prefab Sprout are living proof that in this nasty world of ours, innocence is still alive and politely swinging its legs – not, as we all suspected, living permanently abroad. Everyone who's ever worked with them speaks with reverence of "intuitive musicianship" as though this is something that exists only in fairy tales.

Take away the Perfect English Gent image and Prefab Sprout are musically as interesting as watching wet fish dry. Paddy McAloon hasn't written a good melody since 'When Love Breaks Down'. Otherwise from the sing-song frogs' chorus of 'King of Rock and Roll' it's downhill all the way, with the single exception of 'I Remember That', which matches a superb lyric with an appropriately fay melody.

The production (Thomas Dolby, Jon Kelly, Andy Richards, with a little help from McAloon himself) is impeccable, precise and, well, bland. Just when each track needs some real character stamped across it, to counter McAloon's dissipated vocal, all the producers have done is kow-tow to the rarified aura which I'm sure the band really do exude. The result is that every track treads a path roughly identical to the last. Only 'Knock On Wood' (no, not that version) is allowed to show some guts.

In short, nothing to injure the mind of the innocent child, nor ruffle the feathers. ■ *Nicholas Rowland*

Sade
Stronger than Pride
Epic/CBS LP

Sade have a lot of inbuilt limitations. One is that Ms Adu (the one you might have noticed hogging the front covers to herself) has a range of only four notes; the other is that Stuart Matthewman, the main musical driving force behind the group, knows only four chords. Since three of these are diminished sevenths, Sade has ended up with a bit of a reputation as a sassy jazzer, but I bet she couldn't skat 'Mac the Knife' to save her life.

And yet I've found each album in turn an exquisite listening pleasure. Is it because I'm a sucker for a cute little lady with freckles on her nose? Is it because I once stole a pineapple from a Sade après-gig extravaganza? Is it all three?

No. It's because I think that Sade, the band, happen to be one of the tightest, smoothest and most mature outfits in the business. Listen to the arrangement of any track, past or present, and you'll immediately notice how well it's all put together, how "right" it sounds, how much room each instrument is given to breathe in the mix and most remarkable of all, how much variety they manage to squeeze in there. Then note the ▶

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►sheer effortlessness of it all. Amazing.

Stronger Than Pride reveals a band with an even more mature outlook, capable of surpassing Robin Millar's faultless execution of the first two albums with a superb DIY production job. Interestingly, this one happens to be a lot less overtly "acoustic", with the samplers being wheeled out left and right and centre for some extremely subtle rhythmic and harmonic accents.

You've heard it all before (though perhaps the notes were in a slightly different order), but Sade have never worn a more beautiful set of disguises than they do here. ■ *Nicholas Rowland*

demoT·A·K·E·S

We say "Hello, Quebec" for our first Demo-taker of the month. Descendez par ici, Monsieur **Claude Giroux**.

His music is that enthusiastic brand of MOR pop, strong in melody and solid in rhythm, which adapts equally to stirring TV theme, radio playout or sonic scintillation during that better class of elevator ride. If I tell you that one track sounds exactly like Kiki Dee/Elton John's 'Don't Go Breaking My Heart', then you'll get a pretty good idea of what I'm talking about.

There are three short instrumentals in all, which together amply show off the facilities Giroux has built up in his MIDI/8-track home studio. It's based around an IBM XT clone of unspecified name and origin which runs Personal Composer sequencing software.

Giroux inputs everything in real time, including the rhythm tracks (Roland Octapad triggering a TR505 and Sequential TOM). This certainly helps to bring humanity to the muzak, though occasionally the tom rolls get a little too over-enthusiastic. (Giroux's former life as a percussionist coming to the fore I suspect.) Also plugged in to the computer are a Roland GM-70, GR300 and GKI MIDI guitar controllers and DX7. Other bits and pieces include the Roland MKS20 and MKSI00, Korg EX800 and CX5M.

Giroux obviously still likes the bell-type DX7 sounds, which the rest of the world has now hackneyed to death, though somehow within his work, they sound peculiarly fresh and appealing.

Back to sunny New Malden, where **Kudos**, alias Al Ferrier (Mr), is ploughing a very different furrow with the help of the sort of gear no self-respecting MIDIphile would be seen dead with, but which as this demo proves still has plenty of tricks up its sleeve. 'Memorabilia' is a wonderful piece of minimalist industrial funk, consisting of little more than an infectious bassline (probably from a Moog Rogue) and the mechanically rigid beat of TR606 drum machine, EQ'd to give that dry, clicky sound which was in vogue when ... well, when TR606's were in vogue. It's the sort of track which leaves you wondering why we still go to the bother of sequencing up 32 tracks of intricate harmonies, when the simplest way of getting those old toes tapping is find a decent bass, the right tempo and leave the rhythm to speak for itself.

'Rain in The Sahara' follows with a similarly infectious, though more off-beat, rhythm track, with drum sounds updated by use of the TR505. In addition we've got a Roland SH101 and Korg Poly 800 adding suitably haunting background sounds. Unfortunately 'Hidden Faces' meanders a bit, even within its short framework, but overall creditable stuff from a man who once had the misfortune to be in a band called Neon Sunset *and* admits it.

There's something about the precociousness of **Mr Quinn** which appeals to me. First off, there's the title of their six-track demo cassette, *About to Move Mountains*, which suggests that rare combination of glorious arrogance and charming self-effacement which often characterises a band aiming to succeed. Second is the fact that while admitting that this (their first) demo is a bit ropey, they've still got the bare-faced cheek to be offering it for sale at £1.75 in order that they might raise money to produce a "better version". Ever thought of applying for an Enterprise Allowance Scheme, boys?

By now you should have realised that Quinn (Mr) is not one individual, but three: Martin Disley, Nick Fleming and Gareth Hayhurst, who all sing and play/program various synths between them. The result? Spiky, sequencer driven pop aimed fairly and squarely at the commercial market.

The trusty CX5M is the band's workhorse (as it seems to be of every group and individual who exist in that twilight zone called Being Utterly Skint) and this is aided and abetted by a CZ101 (another favourite of the bargain basement), Korg Polysix and the occasional begged DX7.

However, like many others working at budget level, Mr Quinn seem to have transcended the limitations of their equipment, partly through recording in a proper eight-track studio, albeit during "down time". The only thing that has really suffered in this process are the vocals, which would have benefitted from more careful "production".

Occasionally, I felt the sequencer was over-used, particularly as it highlighted the fact that many of the songs are built around the same bass rhythm, that ongoing "bam-bamba-bam" so beloved of a group whose name I won't mention for fear of provoking a vitriolic response from the Pet Shop Boys. (Oh, bugger.)

What I really want to know is, if you buy a copy of *About to Move Mountains* will you be able to trade it in against the more polished demo when, and if, that one comes along? The foolhardy might like to tell me by sending their money to N Fleming, 410 Darwen Road, Bromley Cross, Bolton, Greater Manchester, BL7 9JD and seeing what happens.

The demo from **Sixteen Voices** on the other hand, has no pretensions to the pop charts, being but a series of musical sketches to please the ear of their Swedish composer, Thomas R Kolb. A veritable novel accompanies his package, outlining the trials and tribulations of saving enough money for the "king of Casio synthesisers", the CZ5000. All I can say is that paper rounds in Sweden must pay pretty handsomely if Kolb's current gear list is anything to go by. (CZ101, Korg DW8000, Roland JX-8P and TR909).

There are six pieces on tape, all of which confirm my belief that everyone in Abbaland is bjorn with an intuitive feel for hi-tech instrumentation. Like every demo from Sweden I've so far come across, Kolb's programming is superb, the playing faultless and the arrangements absolutely first rate. The usual drawback in these cases is that it's all a bit too perfect, there's no soul, but Kolb's work might just be the exception that proves the rule.

Each piece has something to recommend it, from the suitably spooky opening to 'Danse Macabre' to the interesting "rhythm synth" sound on 'Troika' which is a cross between chopped funk guitar and sleigh bells. What impresses most throughout is the way different combinations of timbres are constantly interwoven without cluttering the tracks or obscuring the simple themes.

Occasionally, as tends to be the case with all those who've graduated to synths through home keyboards as Kolb has, the instrumentation is a little too treble heavy. Otherwise this is MIDI chamber music at its best.

That phenomenon known as Long, Synthetic, Gently Pastoral and Thoughtfully Introspective Instrumental Music (there, I've managed to get away without saying New Age) is represented this month by **Steven Watson** in the form of a 12-minute opus called 'Kaleidoscope' inspired by the "beautiful" (sic) music of Tangerine Dream.

If you read this column regularly you'll know that I have distinct problems with this type of music (my analyst tells me the wrong fairies were invited to my christening) but to give Watson his due, I was generally impressed. Present throughout the various sections which go to make up the piece is a strong sense of melody around which are woven some interesting textures. Impressive too were some of the sounds, notably the opening pan pipe patch, meticulously programmed on a Casio CZ5000. Other instruments included Korg DW6000, Clavinova, TX7 and RX21, the latter contributing a nicely understated rhythmic pulse to the second, alas all too brief, section. The recording itself was done on the four-track machine which Steven's school evidently puts at its pupils disposal. (Baker will soon put a stop to that) with a Midifex providing the necessary ambience.

Inevitably though, 'Kaleidoscope' lacks strength and thematic integrity since nothing is ever developed, nor do the themes re-emerge at any later stage to give a sense of musical unity.

It's a criticism which can be justifiably levelled at most recordings which follow this continuously changing linear structure (including Tangerine Dream). I know we're all trying desperately to break new ground, but I often think those old fogey classical chewns with their theme/variation/recapitulation approach have something to teach us after all.

Be warned though, it can made you deaf. ■ *Nicholas Rowland*

Send your demo-tape, along with some biography/equipment details and a recent photo if you have one, to: DemoTakes, Music Technology, Alexander House, Forehill, Ely, Cambs CB7 4AF.

Zapp

Hammersmith Odeon

THIS IS CRAZY. The stage fills with dry ice. Six men charge from the wings in '70s-chic lurex costumes, three of them armed with a variety of remote keyboard controllers, and proceed to assault their audience with a barrage of sound. The musicians, like the audience, are unable to remain still for a second. The atmosphere is electric. The assault abates and a lone spot-lit figure approaches the stage from the rear of the hall, forcing his way through the crowd. Roger Troutman has arrived to take his place in front of Zapp.

Bedecked in something resembling an admiral's uniform and sporting shades and an electric guitar shaped like a carbine, Troutman overplays his role in true James Brown fashion. He gestures and grimaces his way around the stage – to the sheer delight of his fans. The three remote keyboardsmen retreat to take their places along the back of the stage. Three stacks of keyboards (D50s, Mirages, Minimoog . . .), an acoustic drum kit and a small percussion kit (cymbals, Simmons pads . . .) play their respective parts in Zapp's fusion of soul and funk.

What sets Zapp aside from any other funk act is Troutman's use of a Minimoog fed through a voice box. But don't get the idea it's an apology for a poor singing voice – it allows him to articulate his instrumental lines with his voice and "sing" with the power of a synthesiser in full flight. A feat not possible with either instrument alone. For the occasion of the gig Troutman has two Moogs set up, one each side of the stage, mainly for "show" but also to enable him to sing duet parts with one of the marauding keyboardsmen – his son, Roger Jr.

According to Troutman there's a party in town. He plays one half of the audience off against the other in his efforts to find out who's having the best good time. Everyone's agreed the music's good; apart from Zapp's own and Troutman's solo material, we're treated to Wilson Pickett's 'Midnight Hour', Elvis' 'Teddy Bear', Marvin Gaye's 'I Heard it Through the Grapevine' (also to be found on Troutman's *The Many Facets of Roger* LP) – complete with treated vocals – and Cameo's 'Word Up'. Silhouetted against a spotlight, you could be forgiven for believing Troutman *is* Prince. What's going on here? A rendition of 'I Want to be Your Man' (off Troutman's current solo LP, *Unlimited*) blows its vinyl counterpart away. The only song excluded from the set is 'It Doesn't Really Matter' (off *The New Zapp IV U*) – the only ingredient missing from an otherwise perfect evening.

The truth is that *Roger Troutman* is the party – but everyone's invited. ■ *Tg*

E-MU EMAX SE HD

Sampling keyboard

Photography *Rose Rounseville*

As samplers move forever onwards and upwards, the options open to sampler manufacturers are few: supersede or update. Review by Bob O'Donnell.

COMPETITION IN THE sampling world is becoming very fierce. This is true generally, but right now the recent arrival of the much talked-about EPS and Yamaha's long-anticipated TX16W has added volatile fuel to the fire. Manufacturers are being forced to come up with more functions and better features to make sure that their sampler is the one that people want to see and hear. The great thing about this competition, of course, is that we're all benefitting from it (if they could only get those prices down a *little* further . . .).

The E-mu Emax SE is one of the more recent entries into the fray. It has the disadvantage of a hefty price tag but the advantage of being directly related to a successful existing instrument. In fact, the Emax SE is simply an updated Emax; existing Emax owners can add the Synthesis Enhanced capabilities of the SE machines for a nominal charge.

New Features

ALONG WITH THE introduction of the Emax came the promise that even further enhancements and updates were to be added in due course. The first of these takes the form of an internal 20Meg hard disk option (HD) which can be retrofitted to existing Emaxes or bought as a standard feature on new instruments. It adds considerably to the price of the instrument, but if you use it in performance or need quick access to lots of sounds, it's well worth considering. And once you get used to working with a hard disk, you'll never want to give it up. The internal disk can hold the equivalent of 36 floppies in separate banks, and load time from it is a mere three-and-a-half seconds. It comes loaded with 30 banks of sounds (actually 33 if you get the SE HD) from the E-mu library.

Backup, Restore, Formatting and Scanning functions have also been added specifically for the hard disk, so that you can prevent (or at least try to avoid) catastrophic losses. I can't vouch for its reliability – manufacturers get a bit upset when we try the drop test approach to reviews – but E-mu claim that it's shock-mounted and should be able to stand all but the most inconsiderate roadies.

The second, most recent enhancement to the Emax is a major system software upgrade which adds a number of new features, including two new methods of sound generation. The upgrade comes in the form of three disks for existing Emax owners: one containing the new operating system; a preset with 30 different D50-like sampled attack sounds and 95 different factory Spectrums for use in the synthesis mode; and two example disks with sounds created by Spectrum Interpolation Digital Synthesis and Transform Multiplication. If you're buying a new instrument, the new operating system can be considered a built-in function, like the hard disk. Appropriately equipped Emaxes are referred to as Synthesis Enhanced (SE), highlighting the fact that synthesis features are the main portions of the upgrade. But there are other features deserving of a mention.

You can now load entire banks of sounds from the hard disk with a MIDI program change. The process still takes a few seconds but it will remotely initiate the load. Also, the Preset Definition Module now includes a Stack Presets function which allows you to layer up to four consecutively numbered presets for those all-important layered sounds. Depending on whether or not each of the presets uses Dual mode or not, you'll either have monophony or dual-note polyphony with the stacked sound.

A transparent change made to the operating system of the Emax with the new software is that it adds a CD-ROM interface capability. In conjunction with this, the American company Optical Media International recently announced a CD-ROM disk made specifically for the Emax which stores the equivalent of 505 floppies (distributed in the UK by The London Synthesiser Company).

The biggest changes, however, appear in the Digital Processing Module, where a number of different digital signal processing (DSP) functions have been added. Four of the functions allow you to alter existing samples in the digital domain, and the last two are the new methods of sound creation. First, the Gain/Attenuation feature adjusts the level of a sample over a range of +/−40dB. By cranking the level up you can produce some really ugly, distorted sounds – which have a beauty all of their own – or by making smaller adjustments you can match the levels between samples and perform other "domestic" chores. The Reverse Sound function does exactly what it says: it permanently and unalterably swaps the numbers in a

sample. The Emax needs a bit of free RAM to perform this, and all the following operations, so you need to make sure that you leave some space with which to work. Otherwise you'll start running into the very tiring "Not Enough Sample Memory!" message. It's *not* fun.

The Change Sample Rate function is a very handy tool for converting samples received using the MIDI Sample Dump Standard into a format which the Emax can use directly. In other words, you could take a sound sampled on an Akai S900 at a sample rate of 40kHz and convert it into the Emax' standard rate of 27.778kHz. The process involves setting the original sampling rate of the sound, setting the desired new rate, and then letting the Emax resample the data. You can also use it to take sounds originally sampled and stored in the Emax and convert them to a lower sampling rate to save memory space.

The Change Pitch feature lets you digitally alter the pitch of a sample over a range of +/−35 semitones, 99 cents. If you need to fix the pitch of a slightly – or grossly – out-of-tune sample, or if you want to use the same sample at a different pitch, this function can prove very useful. I should point out that both the Change Sample Rate and Change Pitch functions can take several minutes of processing time – which the Emax will warn you about – so don't plan on using these in a tight situation.

New Sounds

THE TRANSFORM MULTIPLICATION feature is the first of two new sound generation methods offered by the SE upgrade. Both methods give the Emax synthesiser-like capabilities, but they still actually produce samples and must be treated accordingly. In other words, you still have to deal with synthesising sounds for different sections of the keyboard and mapping presets to their proper location. You can generally get away with fewer samples across the keyboard than you normally would be able to – two or three should be fine – but, unlike a synthesiser, you still have to worry about the problems of pitch-shifting when you transpose the samples a long way from their original pitch.

Transform Multiplication produces its sounds by taking two samples – the current sample and another one of your choice, and combining them in such a way that all frequencies shared by the two sounds are kept and accentuated and all other frequencies are removed. The results are often more wild than either of the original

Transform Multiplication *"Most of the sounds on the E-mu disk are unique timbres that I can't imagine being produced by any conventional synth or sampler."*

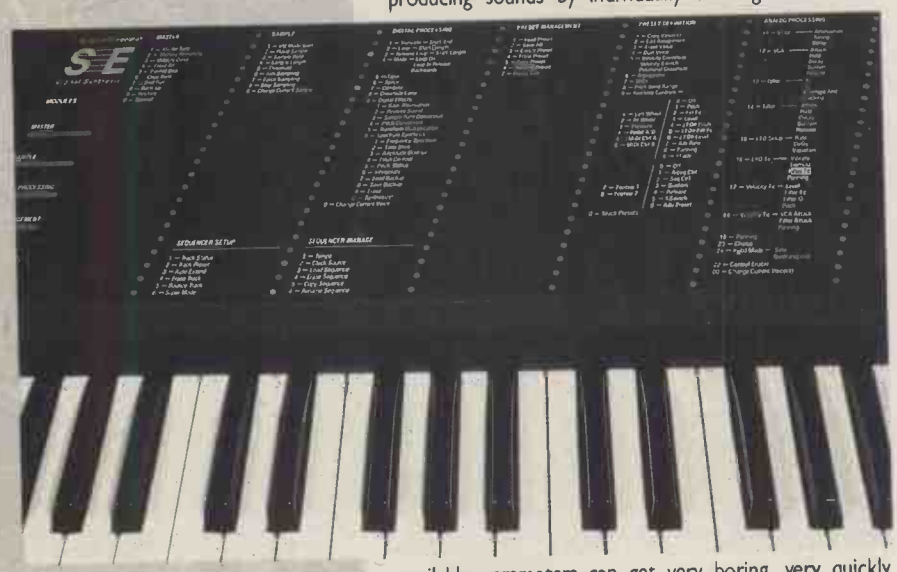
sounds might suggest. E-mu provide a disk full of excellent examples to give you an idea of the things you can do with this feature. Most of the sounds on the disk are unique timbres that I can't imagine being produced by any conventional synth or sampler.

According to the manual, Transform Multiplication can be used to experiment with room impulse responses – a rather esoteric application if I've ever heard one – but I think you'll have more fun just playing with it. Be prepared to be extremely patient, however, because as nice as this feature is and as interesting as the resulting sounds may be, they take a *long* time to produce. One experiment I tried took 41 minutes and the result was a useless din. Another point to be aware of is that you can only use very short samples when using the TM function, and consequently only produce short samples with it – looping the result is almost mandatory. The maximum combined limit of the ►

► two samples can only be 32K, which works out to a little bit under 1.2 seconds at the 27.778kHz rate. The sampled attack waveforms which come with the new development disk turn out to be excellent fodder for experiments . . .

Spectrum Interpolation Digital Synthesis is certainly a mouthful, but what E-mu have basically added to the Emax with the Spectrum Synth feature is a slight variation on true additive synthesis. You have access to 24 sine wave "oscillators" which can each be controlled by independent, 24-stage frequency and amplitude envelopes, or "contours". You can also set the pitch of the sound's fundamental and the pitch ratio for each of the remaining harmonics.

Enticing as that much control and flexibility sounds, producing sounds by individually defining each of the



available parameters can get very boring, very quickly. E-mu obviously realised this, and came up with a number of short cuts to the process. The two basic concepts they've come up with are Spectrums and Time Slices. Spectrums are simply the static amplitude and frequency ratios of all 24 harmonics at a given point in time. In other words, they describe a single cycle waveform. E-mu supply 95 of these, but you can create as many of your own as you want. Time Slices are simply Spectrums placed at a particular point in time. Each SE sound consists of 24 Time Slices equally spaced out across the length of the sample time you're working with, and each of these Time Slices holds its own Spectrum.

The Interpolation part of the name comes from the fact that you can define the Spectrum at certain Time Slice locations and then let the Emax figure out what the Spectrums should look (and sound) like at the other Time

Synthesis *"Smooth synthesis interpolates from Time Slice to Time Slice producing gradual timbre changes; the stepped function jumps abruptly from one Time Slice to the next."*

slice points. In other words, you could put a sine wave Spectrum at Time Slice 1 and a more colourful brass-like Spectrum at Time Slice 24, then select the Interpolate Function from the 10-option Spectrum Synth menu and the Emax will do all the dirty work of filling in the other 22 Time Slices for you.

The actual operation of the Spectrum Synth is straightforward. After you've created an empty voice to work with you can either place an existing Spectrum at a certain Time Slice location, draw a new Spectrum or Time Slice, or edit an existing one. Drawing is achieved by moving the data slider up and down as the cursor moves across the LCD – the Emax gives a count-off and then starts to move the cursor automatically after you select the Draw function. Similarly, editing is done by stepping through the various harmonics with the cursor controls and making adjustments with the data slider. You can also do the same for individual harmonics' frequency and amplitude contours, but in that case you'll draw out the levels at the 24 different Time Slice locations. In other words, it's like working along the y-axis as opposed to the x-axis.

The process of creating Spectrums, Time Slices and contours works pretty well but it is slowed down by the Emax' aggravating habit of returning to a main menu after it's performed a function. For example, after you've drawn a Time Slice, you get the option of editing or copying it, but you can't start drawing another one without having to leave the menu, select a new Time Slice location and then start again. Why? Thankfully, choosing the fundamental pitch and ratios for each of the harmonics – which can range from 1.00 to 40.99 in increments of one hundreth – can be accomplished in one menu access.

Once you've created a set of parameters that you like, you can save them in one of three backup banks and then load them back into the active voice at any time. You can also erase any Spectrums, Time Slices or contours that you've created.

The final option in the menu is the Synthesise function, which takes the parameters you've created and crunches them into a sample which the Emax can play back. You can choose from two types of synthesis: smooth or stepped. The smooth synthesis function will interpolate from Time Slice to Time Slice to produce gradual timbre changes, while the stepped function will jump abruptly from one Time Slice to the next, for PPG-like sounds. The amount of time it takes depends on the complexity of the Time Slices and the length of the voice you're working with, but to give you an idea, you can synthesise a fairly simple one-second sample in just under a minute.

Like any synthesis method, the quality of the sounds you can create with the Spectrum Synth ranges from awful to very usable. Again, the sample disk provided with the update gives a good indication of the types of sounds you can create. Theoretically, of course, you should be able to create or recreate any sound with additive synthesis, but practically, most of the sounds you'll hear emanating from this section of the Emax have a bright, metallic edge to them.

Verdict

E-MU HAVE DONE an excellent job of continuing to support the Emax. Both the HD and SE options offer some powerful features not available in any other sampler in its price class. Certainly other manufacturers have hard disk options, but none offer the power and convenience of an internal hard disk. Likewise, some samplers have basic wave-drawing functions, but none have the sophistication of the Emax' Spectrum Synthesis, let alone Transform Multiplication and the other DSP functions.

Problems do exist with the SE upgrade – some of the time requirements to perform certain functions border on the absurd – but I think it is more appropriate to applaud E-mu for their efforts to get as much out of the limited processing power of the Emax as they could, than to chastise them for making us be patient. This is particularly true considering the low price of the upgrade. Any viable attempts to incorporate new methods of sound generation should be welcomed with open arms. ■

Prices *SE upgrade for existing owners £199; Emax SE £2399 or £2249 for rack version; Emax SE HD £3149 or £2999 for rack version. All prices include VAT.*
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PROGRAMMER'S *protocol*

Photography *Lizzy Ellis*

Since playing keyboards on the infamous Frankie Goes To Hollywood sessions, Andy Richards has been busy building a reputation for himself as Fairlight programmer and record producer. Interview by Nicholas Rowland.

WHEN SOMEONE HAS been talking to you at great length about their state-of-the-art keyboard rig which represents an investment of upwards of a hundred grand, you don't expect them to finish up by saying how much they look forward to the day when their gear is made redundant by the next generation of instruments. Nor would you expect them to hold the view that technology for technology's sake is both boring

and self-indulgent. But these are just some of the seemingly contradictory statements which come up in the course of a conversation with Andy Richards, currently one of the busiest Fairlight programmers-cum-session keyboard players in the bizz.

"I must say I'm a little depressed", he confesses with a sad smile. "Technology seems to have reduced everything to the lowest common denominator, rather than the highest as it should be. The charts are full of records which have no identity beyond the voice of the lead singer. Take that away and you honestly wouldn't know who you were listening to."

Thousands would have no hesitation in agreeing. Yet many people might find it rather puzzling to hear these sentiments expressed by one who makes his living contributing to certain of the records in question. Wasn't it Richards himself who produced the Pet Shop Boys' 'Heart'?

The fact is that, having been involved in keyboard technology ever since it came into existence, Richards is in a position to see both its good and bad points. Hence, while he undoubtedly enjoys discussing the technical aspects of hardware and software, he's also extremely aware of the bad habits technology can lead people into.

LET'S START SOMEWHERE near the beginning - in 1983 to be precise. This was when Richards first came to prominence as one of the gang of four who helped turn a set of rough demos from a bunch of Liverpool lads into the singles 'Relax' and 'Two Tribes' - two of the most stunning and influential production jobs of the '80s. As ZTT sidesman, he was also involved extensively on the rest of *Welcome to the Pleasure Dome*, along with tracks from Propaganda's *Secret Wish* and Grace Jones' *Slave to the Rhythm*. Having served his apprenticeship under Trevor Horn, he then decided to blow his own and embarked on a freelance producing and programming career working with the likes of Nik Kershaw, Gary Moore, George Michael, Blancmange, Def Leppard, Godley and Creme, Prefab Sprout, Yes, Chris de Burgh, Rush and Berlin. Add to this an extensive list of comparative unknowns, usually recent signings to record companies, and you're talking about an extremely impressive CV.

If you happen to bump into Richards in the studio, you'll also end up talking about the extremely impressive rack of gear which he (or rather his technician, Pete Rowlandson) carts around from session to session. At the heart is the Fairlight Series III along with four hard disk drives and a tape streamer for data storage, plus an extra QWERTY keyboard terminal and screen and tape streamer. To one side is a PPG Wave 2.3 synthesiser and processor, Roland D50 and Super Jupiter module and Oberheim DMX, all linked through a 16-way Sycologic M16 MIDI matrix. Kicking around somewhere nearby you'll also find an Atari 1040 sporting Dr T's and C-Lab sequencers synced to the Fairlight or indeed anything else courtesy of an SRC synchroniser. There's even a printer tucked away in one corner which provides engineers with a diagram of all the outputs and the band with lyric and cue sheets written and edited on the Fairlight's word processor.

Should you decide to hire Richards' services, for around a thousand pounds per day you'll not only be getting this half ton of equipment and someone who knows how to use it, but you'll also be getting an accomplished keyboard player for good measure. Richards began his training on classical piano at the age of six and in his own words "got quite good at it" - good enough, in fact, to graduate with diplomas from the Royal College of Music and London Royal Academy of Music. Along with piano he also studied classical organ for a brief, but influential period.

"I found I liked the idea of being able to make different sounds with different stops, and also the way that it involved developing a different technique of expression. I later dropped it because I realised that the piano was a far more sophisticated musical instrument to play. Also, with the organ you have to find somewhere to practise. Inevitably I found myself having to go into churches late at night. Quite frankly, I got scared wandering through graveyards!"

"People often don't realise that it's the relationship between the sounds and the music that is what actually makes a record work."

When Bob Moog came along with an instrument through which a keyboard player could express himself with sound manipulation rather than keyboard technique alone, Richards was an instant convert. Minimoog and Fender Rhodes slung in the back of an old Cortina, he got out and played with several local Stoke-on-Trent bands before turning fully professional with The Strawbs in 1978. Having fantasised for years about being the keyboard player with all the gear, he suddenly found he *was* the keyboard player with all the gear: a grand piano, Hammond C3, two Mellotrons, Fender Rhodes, Yamaha CS80, ARP Odyssey and a couple of Minimoogs thrown in for good measure.

"The CS80 was my first introduction to polyphonic synths", he recalls. "After that, like everybody else I suppose, I worked my way up through the Prophet 5 and Rhodes Chroma to the Jupiter 8. In fact, I'd say that the Jupiter 8 was the best keyboard I've ever had. It's certainly been the most reliable."

IF YOU WANT proof of the power and versatility of the Jupiter 8, then dig out your old copy of 'Relax' and listen to the sounds that many assumed to have come from a Fairlight.

"It was an incredible feeling when 'Relax' finally fell into place", comments Richards. "The interesting thing about it is how relatively low-tech it was. Very little was sequenced. There was a LinnDrum and a bit of Fairlight, but everything else was played.

"We just didn't have the technology in those days. Things were getting a bit better by Propaganda's 'Dr Mabuse' where we had the Conductor which linked up two Jupiter 8's, two MC4's, three Oberheim DMX's and a TR808 to JJ's Series II. But honestly, we'd spend days trying to get things to work properly even then. Just before 'Two Tribes' we were introduced to the SRC which, for us, really was the start of sequencing in a big way. I remember how we took weeks programming in every single nuance and dynamic. I'd just acquired a PPG Waveterm - the sampling was better than the Series II and in many ways it was a more interesting machine for a keyboard player to use. Also, with JJ's ▶

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►Fairlight and Lipson's Synclavier the three machines seemed a perfect complement to each other. Each little idea we had was blown up in size until it became of monstrous proportions, and we ended up with a record crammed with good ideas and not a single bad one. That really is Trevor Horn's forte: sifting through lots of ideas, then choosing the best ones and pushing them to their limits.

"That's what made it such a brilliant technical record: it wasn't just the sounds that were great or the musical parts, but the way that both of them worked together. People often don't realise that it's that relationship which is what makes a record work. I've always believed that the important thing is to have a good song and a good set of ideas. Everything else is secondary."

Coming back to the present, let's discuss Richards' approach to session work, since he's often called upon to provide both parts and sounds. But before touching on the more theoretical aspects of this, it seems there are some practical details to be sorted out. Would-be professional programmers take note.

"I've spent quite a long time organising my keyboards so that once they're set up, which takes my technician about three hours, everything's plumbed in and ready to go. I hate that faff in the studio which arises from trying to sort out minor technical problems. For example, the number of people who have two synthesisers set up just too far apart for the MIDI lead to stretch between them – you've got no idea how much time those things waste and, if you're in an SSL studio, just how much money that can cost. In fact, leads are a very underestimated item, even in the best studios. People spend an awful amount of money on synthesisers and remarkably little on leads. Then they wonder why things don't sound as good as they should."

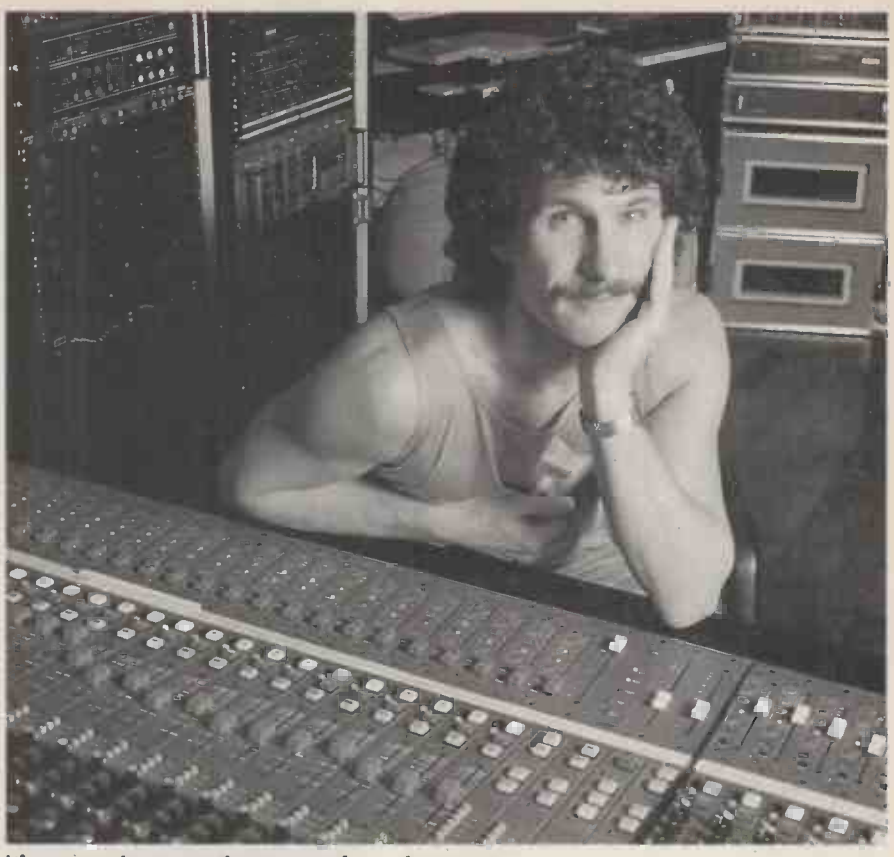
The extent to which the rig gets used is dictated by the stage of the recording when Richards is called in. Sometimes he's there to provide a few keyboard overdubs or short sequenced passages. At other times, he's presented with a band, a tape machine and a demo and told to come out with a finished record.

"I've occasionally turned up and realised that all the track really needs is a live drummer. On the other hand, there are times when you go in and say 'Let's get Page R cracking on the Fairlight and be as outrageous as we can'. And there are other times when I've listened to the stuff they've put down already and had to say 'This is so bad, we've got to start again. I can't guarantee it's going to be any better, but I promise you it won't be any worse'."

IN THE SITUATIONS where he's expected to provide both the sounds and the notes, how easy is it for him to give the artist what they want . . . Indeed, how often do they know what they want?

"Sometimes they talk in abstract terms and say they want a song to fulfil such and such a function. Or they might be specific and say 'Do you remember the middle eight of that track by so and so?'. That doesn't necessarily help because even if I managed to get that exact sound, there's a very good chance that, because the track is different and running at a different tempo, it may not actually fit.

"The important thing is to try and understand the nature of the sound they're after – whether it's a sample, an analogue sound or whatever – and what role it's going to fulfil.



"One of the hardest sounds to come up with is the keyboard pad. Traditionally people have tended to jam loads of stuff together, but personally I believe that one good synthesiser is better than a dozen MIDI'd together. Not only are they not going to be quite in time with each other, since MIDI is such a terribly slow system, but you have cross-phasing of the different waveforms and before you know it you've just got one big mush.

"In that respect the D50 has made life a lot easier because it has lots of wonderful pad sounds. Although I think the only reason they are wonderful is because of the inbuilt reverb. I don't actually think it's a particularly good synth. I mean, how many fewer people would have bought a D50 if there hadn't been inbuilt chorus and reverb? It's a very clever marketing ploy. And to prove it, just listen to the sound of the D50 without the effects.

"One of the hardest sounds to come up with is the keyboard pad – I believe that one good synthesiser is better than a dozen MIDI'd together."

"I think that there are less and less good synthesisers being made. The best ones were undoubtedly analogue ones. There's something about the punchiness and vibe of the analogue synthesiser which these digital machines just haven't got. And when it comes to emulating samplers, they just don't work either."

The Fairlight comes in for its share of criticism too.

"Soon after getting it I realised that the standard 140 megabytes of memory was nowhere near enough. When you're talking about 16-bit sampling at a rate of 44.1kHz or higher, then you're eating up memory very quickly. So I went out and bought three more hard disks to give me 710 megabytes on line."

One hard disk is always kept completely free ►

►for whatever session Richards happens to be working on, while the others are kept as archives. The extra terminal allows him to view the file names and call up new sounds into the RAM, without having to exit from whatever music programs are running on the main system. At the end of a session, Richards records all the new data on tape streamer, and from there it gets dumped to a temporary hard disk directory. Eventually, he looks at any new sounds he might have created and, if he decides to keep them, adds them to the archive.

"It's very important not to let the archives get out of hand, otherwise you end up taking up too much memory with sounds you'll never use again, or giving yourself far too much choice. I've seen people calling up 56 hi-hat samples of every conceivable description across the keyboard. You're talking about nine megabytes of RAM just on hi-hats, and by the time you've loaded your bass and snare variations too, that's practically all your RAM used up. And inevitably, no-one can decide which of those they prefer anyway."

While aware of the pitfalls of colossal memory capability, Richards reckons that the considerable extra cost has been well worth it, particularly when he needs to gain access to libraries of voices extremely quickly.

"No-one wants to hang around while you try and retrieve data off tape streamers. And even if people don't really understand what's going on, they feel thrilled when you can take one of their ideas and quickly manipulate it that one stage further."

In general, though, while many artists might not know that much about the capabilities of the Fairlight when they first arrive, they soon seem to get the hang of it.

"Where the Fairlight is concerned, every artist I've worked with understands the concept very quickly. The Pet Shop Boys, for example, love to generate everything on the Fairlight because they like the screen interaction between the machine and the artist. Everyone likes that ability to look at all 16 tracks at once and see the relationship in real time between them all. I'm surprised that no other software company has yet managed to do that. Other sequencers always seem to have the data hidden in a buffer somewhere. And when you do get a peek at it, it seems to be a row of letters and numbers.

"Also, because the principle of the Fairlight sequencer is quite easy to grasp, you can get those wonderful things which arise from a non-tutored person's relationship to a piece of equipment. Through session work I've picked up a lot more about the intuitive approach, something which I don't have because I always look at it from a trained angle."

While acknowledging the creative accidents that often occur because people don't possess a formal musical education, Richards believes that a musical training is important.

"The more musical your approach, the more longevity you've got. I think that to be able to play to a reasonable standard helps you get more out of the technology. It certainly gives me an advantage over other programmers that can't. And it's extremely useful when someone puts a written score in front of you and says 'play this into the sequencer'."

For that reason, while the Fairlight is described as the most stimulating investment Richards ever made, it also goes down on the record books as "one of the least musical".

"With many of the synths I've owned, the Jupiter 8 in particular, I'd spend time programming what I thought were all these super sounds, but then I'd *play* them. With the Fairlight, because it's really built around this amazing sequencer, your orientation changes towards inputting data rather than developing a playing relationship with it. No wonder I've lost my technique when all I really do is press keys and type in data. Technology has a lot to answer for where technique is concerned.

"Which explains my slightly cynical attitude, because although I have what many people would regard as this fantastic setup, I can really only see its limitations. As far as I'm concerned, music should live and breathe and have soul, yet here you have a machine where you've got to work very hard to make it not sound like a machine. Certainly that's what I aim to do, and I like to think that occasionally I achieve it.

"But then in ten years time, data processing will be so fast, we'll have machines which are fired up and ready to go before you even switch them on. These so-called great instruments of the '80s – the Synclavier, the Fairlight – all of these are going to look trivial and irrelevant compared to the technology which will be at our disposal then.

"I hope that by the time we get to that stage, what will have remained constant is that musicians will still want to make music and sing songs and touch people's hearts."

Let me be the first to sign that particular petition. ■

PATCH WORK

The address to send sounds to: Patchwork, MUSIC TECHNOLOGY, Alexander House, Forehill, Ely, Cambs CB7 4AF. ■

If you're still waiting to see *your* particular synth featured in these pages, then why not be the first to submit some sounds?

Don't forget that if your patch gets published, you'll receive a **free year's subscription** to MUSIC TECHNOLOGY with our compliments. So send us your favourite sounds on a photocopy of an owner's manual chart (coupled with a blank one for artwork purposes) accompanied by a short demo-tape (don't worry too much about classic performances and impeccable recording quality; just present your sounds simply and concisely – and convince us you're the best of the bunch). Include a decent-length description of your sound and its musical purpose in life, and write your full name and address on each chart. And remember, edited presets are all very well, but an original masterpiece is *always* preferable. OK?

CASIO CZ1
Prophet Sync
Robert Thomas, Gwynedd

This patch resulted from Robert's yearning for the classic sound of the Prophet 5 which he was forced to sell. The sound he's produced to fill the gap is full of movement, and should be played with plenty of pitch-bend and portamento. Robert suggests that it should be kept for when you need a really meaty solo lead sound, as it can be overpowering if played polyphonically. ■

PARAMETER

LINE SELECT	MODULATION RING	MODULATION NOISE	DETUNE +/−	DETUNE OCTAVE	DETUNE NOTE	DETUNE FINE	VIBRATO WAVE	VIBRATO DELAY	VIBRATO RATE	VIBRATO DEPTH	OCTAVE +/−	OCTAVE RANGE
1+2	ON		−	0	00	04	1	82	57	12	+	1
(1,2,1+2',1+1')	(ON/OFF)		(+/−)	(0 – 3)	(0 – 11)	(0 – 60)	(1 – 4)	(0 – 99)	(0 – 99)	(0 – 99)	(+/−)	(0 – 1)

1

DCO 1

WAVE FORM FIRST	WAVE FORM SECOND
3	4
(1 – 8)	(0 – 8)

E N V (PITCH)

STEP	1	2	3	4	5	6	7	8	
RATE	85	85	85	85	85	85	84	85	(0 – 99)
LEVEL	66	00	66	00	66	00	66	00	(0 – 99)
SUS/END								E	

DCW 1

KEY FOLLOW	
1	(0 – 9)

E N V (WAVE)

STEP	1	2	3	4	5	6	7	8	
RATE	99	15	99	39	47	54	44	60	(0 – 99)
LEVEL	98	99	00	60	80	55	67	00	(0 – 99)
SUS/END	S		E						

DCA 1

KEY FOLLOW	
0	(0 – 9)

E N V (AMP)

STEP	1	2	3	4	5	6	7	8	
RATE	74	75	50	50	50	50	40	63	(0 – 99)
LEVEL	99	84	45	70	25	60	73	00	(0 – 99)
SUS/END	S							E	

2

DCO 2

WAVE FORM FIRST	WAVE FORM SECOND
2	1
(1 – 8)	(0 – 8)

E N V (PITCH)

STEP	1	2	3	4	5	6	7	8	
RATE	85	85	85	85	85	85	84	85	(0 – 99)
LEVEL	66	00	66	00	66	00	66	00	(0 – 99)
SUS/END								E	

DCW 2

KEY FOLLOW	
1	(0 – 9)

E N V (WAVE)

STEP	1	2	3	4	5	6	7	8	
RATE	99	15	99	39	47	54	44	60	(0 – 99)
LEVEL	98	99	00	60	80	55	67	00	(0 – 99)
SUS/END	S		E						

DCA 2

KEY FOLLOW	
0	(0 – 9)

E N V (AMP)

STEP	1	2	3	4	5	6	7	8	
RATE	74	75	50	50	50	50	40	63	(0 – 99)
LEVEL	99	84	45	70	25	60	73	00	(0 – 99)
SUS/END	S							E	

YAMAHA DX21
Andean
Trevor Stainsby, Dyfed

This authentic-sounding panpipe patch has an ethnic feel to it, but it still retains clarity and delicacy. It is ideally suited to the type of simple repetitive sequence used on Trevor's tape, where it still cuts through despite being mixed into the background. ■

5 ALGORITHM	6 FEEDBACK	7 LFO WAVE	8 LFO SPEED	9 LFO DELAY	10 LFO PMD	11 LFO AMD	12 LFO SYNC	13 MODULATION SENSITIVITY PITCH	14 MODULATION SENSITIVITY AMPLITUDE	15 MODULATION SENSITIVITY EG BIAS	16 KEY VELOCITY
3	7	TRI	30	33	7	0	OFF	5	0		

AME (OP 4, 3, 2, 1): blank

OP	1 FREQ RATIO	2 DETUNE	3 AR	4 D1R	5 D1L	6 D2R	7 RR	8 OUT LEVEL	9 KEYBOARD SCALING RATE	10 KEYBOARD SCALING LEVEL
4	1.73	0	16	23	0	0	6	58	0	0
3	1.00	0	16	31	15	0	0	50	0	0
2	1.00	0	25	31	15	0	7	14	0	0
1	1.00	0	15	31	15	0	9	86	0	0

OSCILLATOR (1–2) · ENVELOPE GENERATOR (3–7) · OPERATOR (8) · KEYBOARD SCALING (9–10)

PITCH ENVELOPE GENERATOR

11 PR1	12 PL1	13 PR2	14 PL2	15 PR3	16 PL3
99	50	99	50	99	50

17 POLY/MONO	18 PITCH BEND	19 PORTAMENTO MODE	20 PORTAMENTO TIME	21 PORTAMENTO FOOT SW	22 FOOT CONTROL VOLUME	23 FOOT CONTROL SUSTAIN	24 WHEEL RANGE PITCH	25 WHEEL RANGE AMP	26 BREATH RANGE PITCH	27 BREATH RANGE AMP	28 BREATH RANGE PITCH BIAS	29 BREATH RANGE EG BIAS	30 CHORUS	31 TRANSPOSE	32 VOICE NAME
POLY														C3	

ENSONIQ ESQ1
Trumpt
Dejan Ivankovic, Yugoslavia

Another good patch for the regularly-featured ESQ1, this brassy trumpet patch all the way from Yugoslavia is bright without being strident, and works especially well for lead lines. ■

	OCT	SEMI	FINE	WAVE	MOD1	DEPTH	MOD2	DEPTH
OSC1	-1	00	00	FORMT1	ENV 2	-02	LFO 3	+01
OSC2	-1	00	01	REED	ENV 2	-01	LFO 3	+01
OSC3	-1	00	02	PULSE	LFO 1	+04	LFO 3	+01

	LEVEL	OUTPUT	MOD1	DEPTH	MOD2	DEPTH
DCA1	63	ON	OFF		OFF	
DCA2	63	ON	OFF		OFF	
DCA3	63	ON	OFF		OFF	

	FREQ	Q	KEYBD	MOD1	DEPTH	MOD2	DEPTH
FILTER	026	02	31	LFO 1	+22	ENV 1	+42

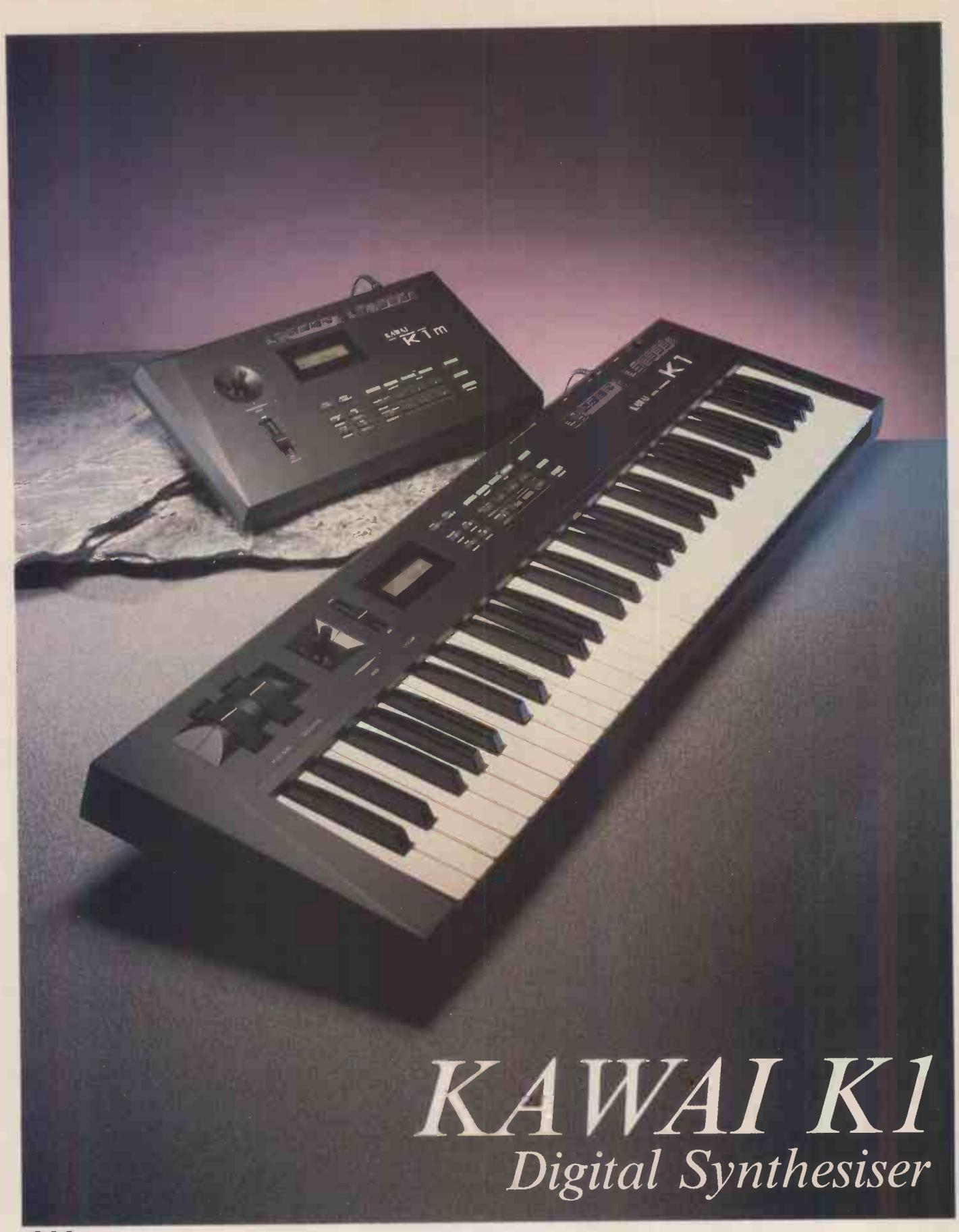
	FINAL VOL (ENV4)	PAN	PAN MODULATOR	DEPTH
DCA4	63	08	OFF	

	FREQ	RESET	HUMAN	WAVE	LI	DELAY	L2	MOD
LFO1	63	ON	OFF	TRI	00	63	00	ENV 3
LFO2								
LFO3	22	OFF	ON	TRI	00	05	25	WHEEL

	LI	L2	L3	LV	TIV	TI	T2	T3	T4	TK
ENV1	+63	+63	+54	63	00	00	00	26	09	00
ENV2	+27	+00	+00	00	00	00	17	00	63	15
ENV3	+63	+00	+00	00	00	00	15	00	27	00
ENV4	+63	+63	+63	40	30	00	00	00	12	00

	SYNC	AM	MONO	GLIDE	YC	ENV	OSC	CYC
MODES	OFF	OFF	OFF	00	OFF	ON	OFF	OFF

	SPL/L	S/L PROG	LAYER	L.PROG	SPLIT	S.PROG	S.KEY
SPL/L	OFF		ON		OFF		



KAWAI K1
Digital Synthesiser

With their K3 and K5 synths, Kawai have begun to make a name for themselves among "serious" keyboard players. Now their K1 synth looks set to take them into the big league. Review by Simon Trask.

THE COMPETITION'S HOTTING up. There are now several new synths occupying the £600-800 price bracket. Korg's 707 (reviewed MT, March '88) and Yamaha's DX11 both offer yet more variations on the FM theme, while Roland's new D50/MT32 offspring (the D110 rack mount and the D10 synth) make the company's LA synthesis available in new packaging.

Bursting onto the scene as a comparatively unknown quantity comes Kawai's latest synth, the K1. The company's previous two synths, the K3 and the K5, have made an

impact without actually breaking through into the big-time. Will the K1 change all that?

Superficially the newcomer appears to occupy D50 territory, adopting the D50's "combinatorial" approach to sound synthesis; yet, as will become apparent, in truth the differences outweigh the similarities.

The K1 has a five-octave dynamic keyboard (attack velocity and channel aftertouch) which has a comfortable sprung action. The synth's front panel is economically laid out, with low-profile pitch and mod wheels, joystick, volume slider, 2X16-character backlit LCD and a modest assortment of squidgy rubber buttons. At the right-hand end of the panel, above the Kawai K1 legend, are diagrams of the K1's parameter organisation in high-visibility light grey.

The synth's rear panel is suitably minimalist. In addition to the power switch and a 12V DC input for the dreaded external power supply (fortunately the connection is secure), there are Left and Right/Mono, headphone and sustain pedal jack sockets, a slot for Kawai's DC8 RAM credit-cards, and the familiar MIDI In, Out and Thru sockets. Notably absent is a volume pedal input.

Nobody could accuse the K1 of being a bulky instrument. In fact, with the addition of a chic Kawai padded nylon carrying bag it's as portable as any electric guitar. As for the K1M module, well, you could almost fit one in your coat pocket.

Sound Sources

WHEREAS THE K5 made the "mechanics" of additive synthesis available to the musician, with the K1 Kawai have adopted a different approach to the creation of sounds using additive synthesis. This time around the company have provided 256 internal ROM-based sounds: 204 have been created using additive synthesis of the first 128 harmonics (these Kawai call VM sounds, standing for Variable Memory) while the remaining 52 have been PCM-sampled. Sadly these are displayed numerically rather than by name in the K1's LCD, so you have to keep referring to a booklet provided by Kawai to see what the sounds are. Basically, it's easier to remember where a particular sound is located if you can associate it with a name.

Kawai have divided the VM sounds into five groups, namely a basic wave group and four frequency groups: low, mid, high-mid and high. The basic wave group consists of 40 variations on familiar synth waveforms, while the other four groups break down into brass, string, piano/electric piano, guitar/bass, wind/lead and bell/percussion/organ categories. Not all of these are intended to be used in their own right; some function best as "colouring" for other sounds.

The 52 PCM samples are divided into one-shot, loop, omnibus loop, reverse and alternate categories. Here you'll find a modest collection of drum sounds lifted from the company's R100 and R50 drum machines, together with, among other things, sampled guitar attacks and harmonics, bowed string attack, pizzicato strings, shakuhachi attack and loop, pan flute attack and loop, voice loop and white noise. The omnibus loops group several related samples into looping sequences. So, unlike the D50, the K1's samples aren't just attack samples; moreover, the attack samples themselves are of varying lengths. As to quality, the K1's sounds are fairly clean if not sparkling (if you get my Dreft); bearing in mind the origin of the drum sounds, I'd say we're talking 12-bit here.

Organisation and Editing

THE K1 HAS two performance modes, with associated patches: Single and Multi. Onboard the synth are 64 Single patches (organised as two banks of 4X8) and 32 Multi patches (4X8 again). Plugging in a RAM card effectively doubles the synth's memory capacity, giving you instant access to a total of 128 Single patches and 64 Multi patches. You can chain up to eight patches (Single or Multi, internal or external) into what Kawai call a Link, and then step through the chain in either direction using the Link +/− buttons on the synth's front panel (K1 and K1M). A useful bonus feature, if a bit half-heartedly implemented.

The K1 allows you to combine up to four of its 256 available waveforms (known as Sources) into a Single patch. You can choose two- or four-Source operation for each patch, making the K1 16-note or eight-note polyphonic respectively. Programming is done through four Groups: Common, Frequency, Wave and Envelope. These have dedicated squidgy buttons, and you access individual parameters within each group by repeated pressings of the relevant button; in addition, pressing the Stick button allows you to reverse through the parameters. Kawai have provided the usual +/− buttons for adjusting parameter values, while the joystick functions as a data entry slider.

"Kawai have concentrated on giving the K1 a thorough complement of performance features which can be used to shape the sounds in a very musical way."

The Common parameters, as you might guess, are global settings for each patch. Here you choose two/four Sources, and define vibrato depth, speed and shape (sawtooth or square); aftertouch control of vibrato; mod wheel control of vibrato; auto-bend depth, time, velocity response and keyboard scaling response (good for pitch glides); aftertouch control of frequency; pitch-bend range; keyboard scaling curve; and poly mode (which essentially allows you to select poly or solo voicing).

The Frequency group allows you to define coarse (±24 semitones in semitone steps) and fine (±50, a semitone either way) frequencies for each Source, along with key tracking on/off (together with a fixed frequency key number, C4-G6, for Off), vibrato and auto-bend on/off, aftertouch control of frequency on/off, and the degree of effect that the keyboard scaling curve chosen under Common will have on frequency (±50). While the last parameter doesn't give you the precise control over frequency that Yamaha's microtonal tuning does, you can quickly set up some weird tuning effects which might just set you off on new creative tangents (alternatively they might just give you a headache).

Wave is where you get to select the waveforms for the four Sources, together with amplitude modulation if required (1:2 or 2:1, 3:4 or 4:3). Additionally you can copy complete frequency, wave and envelope data from any one Source to any other Source in the same or another Single patch – so now you can quickly insert a tuba sound into a piano patch or a shakuhachi sound into a fretless bass patch. Seriously, though, it can be a great time-saving feature.

Underneath the innocuous-looking Envelope button lurk parameters governing volume level, DADSR, velocity curve (1-8), the effect of velocity on envelope level and attack time, the effect of aftertouch on envelope level, and the effect of key scaling on overall level and on attack and decay times. All of these effects can be inverted, so that for instance a hard keystrike can generate a quiet sound (in this way you can set up velocity crossfades between Sources). Incidentally, the initial D of the DADSR envelope allows you to delay the attack of each Source by up to 12 seconds – a feature which can be put to good use creating pitch sequences and echo effects.

By now you may be wondering what's happened to the ►

► filter section. Well, there isn't one (presumably one reason Kawai have been able to keep the price down on a new synth). This absence is compensated for to some extent by the sheer number of "source" sounds in the KI, with many types of sound being available in several timbral variations. Kawai have very sensibly concentrated on giving the KI a thorough complement of performance features which can be used to shape these sounds in a very musical way if utilised properly.

Sounds

THE D50 SHOWED what an impact a well-programmed collection of sounds can have, and it's a lesson which hasn't been lost on Kawai. The internal sounds which come with the KI and the first set of extra sounds available on RAM card show the instrument off to its very best advantage.

What is impressive about the KI is the sheer variety of sounds it can come up with. It can produce sharp, bright percussive sounds such as 'Brite EP' (IA6), 'Vibe' (IB4) and 'HardMallet' (IB5), and smooth warm sounds such as 'String Pad' (IA4), 'StringOrch' (EB1) and 'VeloString' (eB1). Similarly it can produce a good range of, say, bass sounds, from the snappy 'DigiBass' (ID1) to the warm, rounded tones of 'Ac Bass' (ID2).

Kawai's synth has a nice line in "acoustic piano" sounds, such as 'Piano I' (IC1) which effectively captures the top-end hammer strike, and 'Elec Grand' (EB7) which has a particularly strong bottom end. They won't oust today's digital pianos, but they are convincing. Organ sounds are well catered for, from the clean-edged, slightly Leslied 'Jazz Organ' (IC4) to the ominous church organ sound of 'Phantom!' (EC2) to the growling 'Red Onions' (eC2), a pretty good attempt to recreate the sound of Booker T and the MGs' 'Green Onions'. ►

► Acoustic guitar sounds come off well, sounding warm and rounded or sharp and incisive as required, successfully avoiding "plinkiness"; '6 String' (IA3), 'Backin' Guitar' (IC8) and '12 String' (iA3) are particularly effective.

Atmospheric sounds are very much the KI's forte: 'Peaceful' (EA1), 'MysteryAir' (eA3), 'Breath' (EA6) and 'Water Drama' (ED2) all sound like the programmer wished he'd written the soundtrack to *Bladerunner*. Another standout atmospheric patch is the gloomy, scary 'Poltergeis' (eD2), which'll have you reaching for a crucifix. At the same time there are some very good glassy, shimmery sounds, such as 'Shimmer' (eA1) and 'Glassy' (eD5). Nothing if not truthful, these names. The KI also has its share of fashionably breathy sounds – such as 'Voice Ahhh', which Kawai have sensibly placed in the pole position (IA1). If I had to pinpoint weaker areas, I'd say that the woodwind sounds qualify (at least as evinced here), as do (to some extent) the brass sounds. Reservations? Well, the absence of filtering means it's not easy to tweak a sound to make it brighter or darker, though of course this task could feasibly be assigned to external EQing.

Overall the KI manages to achieve a very successful balance of natural and synthetic sounds, providing you with a broad vocabulary of sounds to draw on. Yes, it is a digital synth, but it's capable of producing a wider variety of sounds than that label tends to suggest. I'd say it has a "translucent" quality which sets it apart from analogue synths you've known and loved, and that it has not an analogue warmth, but a digital warmth – a "translucent warmth", if you can imagine such a thing.

MIDI and Multi

MIDI IMPLEMENTATION HAS been a strong point of all Kawai's hi-tech instruments, and the KI isn't about to let the side down. You can set separate MIDI transmit and receive channels (1-16) and independently enable/disable the transmission and reception of aftertouch, pitch-bend, modulation, hold pedal, velocity and patch change data. Additionally the reception of volume and SysEx data can be enabled or disabled (the KI has no means of transmitting volume changes, unfortunately).

SysEx communication allows patches to be saved and loaded individually or as a bulk dump (single or multi, internal or external). Patches can be transferred in either direction without handshaking, but for anyone wanting to write editor/librarian software there are appropriate handshaking commands available for automating the whole process.

The KI sports an extremely flexible Multi mode implementation, with up to 64 Multi patches available at any given moment (32 internal, 32 on cartridge). A Multi patch has eight Sections, each of which can be assigned a Single patch together with low/high note limits (C2-G8), velocity-switching response (soft, loud or all), polyphony (0-8 or variable), transposition (±24 semitones in semitone steps), fine-tuning (±50, a semitone either way), volume level (0-100) and pan position (L, R or L+R). Additionally, each Section can be set to receive on its own MIDI channel (and different Sections can be assigned to the same MIDI channel, for split and layer textures), but the KI still transmits on a single channel. While data reception on/off states apply equally to all Sections in a Multi patch, each Section is completely independent in its response to MIDI performance data. This means you can warble your choir, sustain your strings and bend your trumpet all at the same time.

Unfortunately the increasingly sophisticated multitimbral implementations of today's synths isn't being matched by a corresponding increase in polyphony. Dynamic voice allocation (as used on the KI) can give the impression of increased polyphony by assigning voices to musical parts as and when they're required (on the principle that not every "instrument" will be playing constantly). But this voice-stealing can cause its own problems – where, for instance, you have a prominent bassline that is suddenly silenced by voice-stealing at just the wrong moment. Kawai have thought of this one, and allow you to assign a fixed polyphony to any Section up to a total of eight voices (Roland do the same on the MT32).

Additionally the KI is clever enough to dynamically vary its polyphony according to the combination of two- and four-Source sounds in use at any given moment. But none of this gets around the fundamental problem: not enough voices (particularly if you're also layering Sections). The long-term solution may well be for manufacturers to increase the polyphony of their instruments, but in the meantime you can always link up two instruments to give double the polyphony. For this to work, the instruments must have an Overflow mode (so called because it only transmits notes via MIDI when an instrument's voice capacity is at full stretch). Given the KI's multitimbral power, Kawai's omission of such a mode on their new synth is a real disappointment.

To match the various performance modes on the KI, Kawai have provided their synth with three alternative ways of responding to patch changes. Norm means that patch changes 0-63 will call up a Single patch while patch changes 64-127 will call up a Multi patch. You should choose Sect if you want to change patches in individual Sections of a Multi patch (patch changes 0-63) as well as the Multi patches themselves (patch changes 64-127). Finally, Link allows incoming patch changes to call up patches in the KI's Link chain of eight patches.

It's important to realise that the KI's Multi mode isn't exclusively a MIDI feature. Each of the eight Sections in a Multi patch can be assigned to MIDI, Keyboard or Mix (MIDI *and* Keyboard). By selecting either of the latter two, you can organise up to eight sounds at once on the keyboard. The KI's low and high note-limit settings and velocity switching allow you to define an impressively wide variety of keyboard textures, which can of course be used in conjunction with sounds triggered remotely from a MIDI sequencer. In fact many of the 32 Multi patches which come programmed into the KI are "extended" Single patches rather than multitimbral configurations for sequencing.

"The KI manages to achieve a very successful balance of natural and synthetic sounds, providing you with a broad vocabulary of sounds to draw on."

Verdict

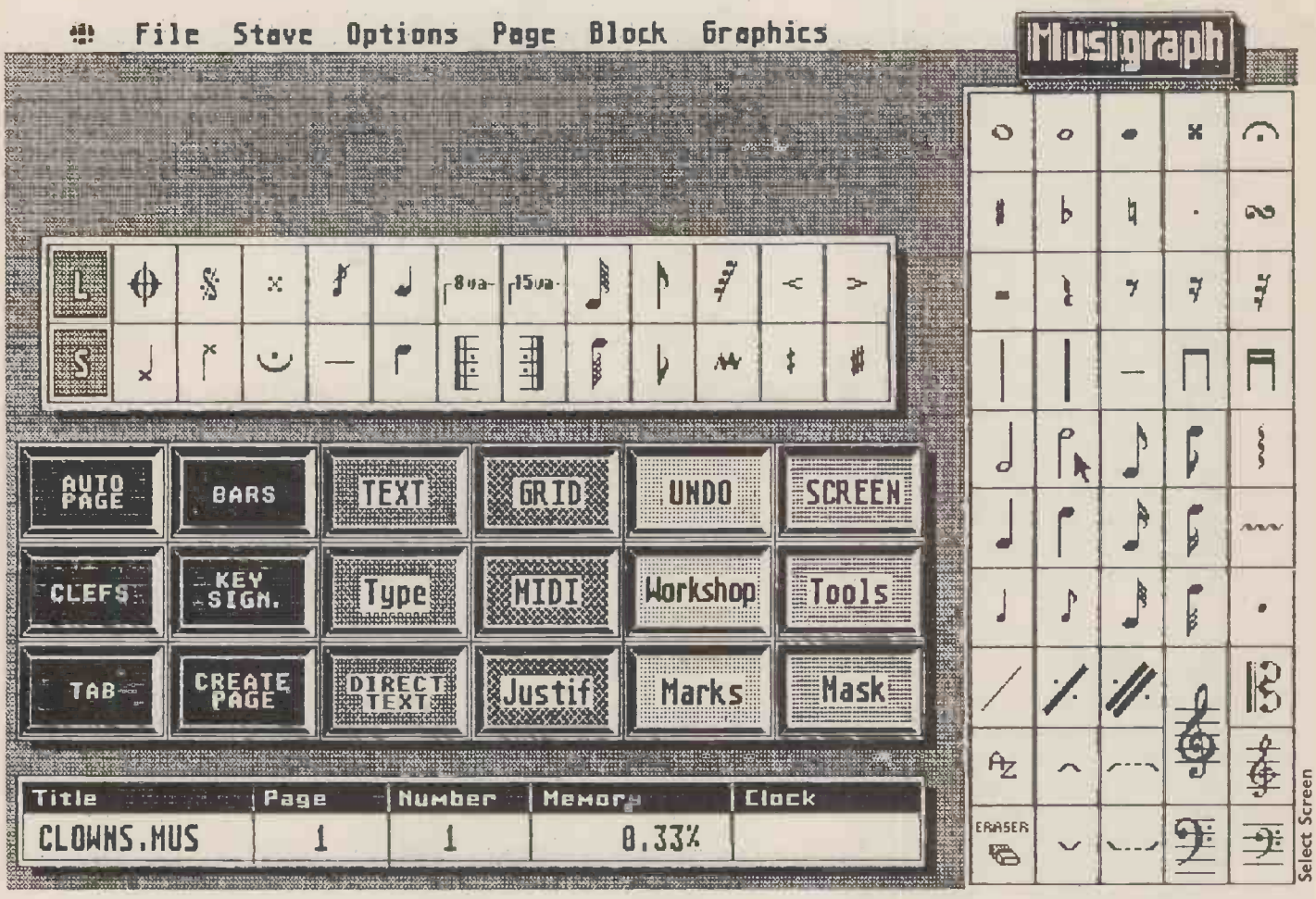
THE KI IS destined to put Kawai in the synth big-league. Its extremely competent handling of a wide range of sounds coupled with musical responsiveness and ease of programming make Kawai's latest synth a rewarding instrument to play. And its flexible handling of multimbrality means that it should find a place in many a sequencing setup.

Don't hesitate to investigate. The KI is already a serious contender for best synth of the year. ■

Prices *KI £595, K1M £395; DC8 RAM card (which will come with sounds programmed into it for no extra charge) £30-40 (tentative); all prices include VAT.*
More from *Kawai UK, Sun Alliance House, 8/10 Dean Park Crescent, Bournemouth, Dorset BH1 1HL. Tel: (0202) 296629*

MUSIGRAPH

Scorewriter for the Atari ST



As the scorewriting program comes of age, one French company adopt a graphic rather than musical approach to putting the dots on the stave. Review by Ian Waugh.

IF 1987 WAS the year the Atari ST established itself as the UK's most popular music computer – which it was – then 1988 will surely go down in computer history as the year of the scorewriter.

The transfer of music from brain to fingertip to keyboard to traditional music notation has long been a dream of many a musician. Now, the advent, popularity and affordability of the 16-bit computer looks set to make it a reality.

Before I whet your appetite any further, I'd better make it clear that Musigraph does not attempt a fingers-to-paper transfer. This type of operation is not easy and software developers are only just beginning to get to grips with the problem. For example, they haven't quite worked out if a program should interpret that staccato crotchet you just played as a crotchet with a dot above it or a quaver followed by a rest. Triplets are tricky things, too. Unless you're a genuine keyboard wizard you'll have quite a bit of editing to do after your music's been through the conversion process.

The CAD

HOWEVER, ON THE road to a perfect music score, Musigraph bypasses the keyboard part of the process completely. Quite simply it's a CAD (Computer Assisted Design) program, dedicated to the production and placement of music symbols on the screen. As such, its operation is rather different to what you would expect from a step-time traditional notation music editor, something it most definitely is not.

As Musigraph doesn't need reams of code to convert music files, it will run quite happily on a 520ST – most file-converting scorewriters require at least a megabyte of RAM. You do require a high resolution monitor, though.

In use it's very quick and for once the publicity handout isn't far from the truth: "5 minutes with Musigraph will be enough to convince even the most computer illiterate (do they mean reviewers?) that this program is no more difficult to use than an electronic typewriter". Well, let's put down a few notes and see.

The program has two screens – a Selection screen and an Edit screen. Logically enough, the Selection screen is used to select a music symbol or function and the Edit screen is where the action takes place.

The Edit screen displays a page of music which will eventually print as half an A4 sheet, although you can vary the final printout size and format (more about this later). You can create follow-on pages with the click of a button and pages can be inserted and deleted.

Each page is an entity unto itself, however, so if you're dumb enough to leave out a stave, say, on an early page you can't just push all the other staves down, you'll have to create a new page, insert the missing stave and then transfer music *backwards* to fill up any empty space. Actually, that's not very hard to do – better than you deserve if you make such a pig's ear of your music.

The program can be controlled with the mouse almost completely, although you need the keyboard for text input, of course, and to enter a few parameters and for the Undo function. The Tools menu lets you assign 20 music symbols to the function keys and in practice, you'll probably find yourself using a combination of mouse and keyboard.

If you click on OK in the Tools menu with a write-protected disk in the drive, it will send you back to GEM even though you may try to cancel the option. It does give you the opportunity to save your score, though.

Talking of disks, the program will load an incompatible file – one without the correct suffix – and hang up. You should be more careful, I suppose – or the program should check what it's been asked to load.

The Score

THE FIRST STEP in the creation of a score is to put some staves on the Edit page. You can fit as many staves onto the screen as you like – if you want to be silly about it – but the program offers you sensible defaults and will automatically create five or six single staves, three piano staves or two piano/vocal staves. There are also "free-floating" staves which you can position anywhere on the screen.

You can select Guitar Tablature and there are special guitar symbols in the Stave Menu to produce guitar tablature notation such as numbers to indicate fret positions. There are guitar grid, finger position and open chord symbols so you can create your own busker-book type arrangements.

To put a symbol on the page you simply click on it. This takes you directly to the Edit screen – you don't pass Go, you don't collect £200 but neither do you waste time with superfluous clicks. You move the symbol around with the mouse and a click on the left button fixes it in place. You can continue to insert the same symbol anywhere else on the page. A click on the right button takes you back to the Select screen where you can pick up a different symbol.

There are two types of symbol. Simple symbols are of fixed size such as notes and rests and can be placed with a single click. Extended symbols require two clicks and are used to position ties and draw straight lines and boxes.

As Musigraph is a graphics program rather than a music one, it doesn't decide where a symbol should sit on the stave so you can place rests, for example, on any line, essential in pieces with more than one part on the same stave. There is an Align function, though, which ensures that the notes fit centrally on a line or in a space. Other symbols use Align to square themselves up, too, although you can deselect Align for pixel precision.

The Align function works vertically but not horizontally, so to help space the notes correctly you can superimpose a grid on the screen which subdivides it up with 64 equally-spaced vertical lines. With this you can achieve pinpoint accuracy. There is also a Marks function which lets you insert up to 16 vertical lines at any position. All symbol placements, however, are entirely under your control. You don't have to follow the grid so you can squeeze notes into a bar if you suddenly come across a run of demisemiquavers, for example.

Text can be inserted absolutely anywhere and there are three fonts and four type sizes to choose from. You can type directly onto the page or enter the text first and then position it.

There are Block Cut, Copy and Paste functions and, again as a result of Musigraph's graphic design, you can lift a set of symbols – say a scale in the key of C – and drop them anywhere on the screen, for example, a tone higher to produce a scale in D. How's that for instant transposition? A Block can even be defined as an entire page and blocks can be saved and loaded so it's possible to transfer copy from one program to another.

As each page is its own master, you can't notate an orchestral score and then print out the individual instrument parts separately. You could create individual scores from a master score, however, by lots of Block saves and loads.

Again, as a result of the program's graphic heritage, there is no transposition facility to enable orchestral arrangers to write a piece on piano and then transpose it for a Bb or Eb instrument or into the alto clef.

There are Erase and Mask functions which can be used to blot out unwanted stems or lines – or anything else – but they don't actually remove anything, they just hide it. The relevance of this will become clear when we look at the Undo function.

The pages are not stored in a graphic form but as a series of operations, and the first time you change pages the program runs through all the operations you used to draw it – it only takes a second. If you make a mistake, the Undo key will immediately remove the last operation. But more than that, it takes advantage of this method of storage by allowing you to step backwards and forwards through the operations until you reach one you want to Undo. This will most likely be a music symbol but as Erase and Mask don't actually delete anything, you can even Undo an erasure.

This may be a lifesaver or it may be totally irrelevant – it depends how well organised you are. Although Musigraph permits a certain amount of chopping and changing, you'll get the best out of the program if you know what you're going to do before you do it. I think that probably applies to all scorewriters.

The Symbols

MUSIGRAPH CONTAINS ALL the common music symbols you're likely to need – along with some you may never use. They are all very well-designed and under the Workshop heading you'll find a nifty little symbol designer so you can produce your own. A symbol, once defined, can be displaced in any horizontal or vertical direction and it can be made to conform to the Align option.

Sets of symbols can be saved and loaded but loading a new set will overwrite the existing one and replace any old symbols already on a page – again a result of storing screens as a series of operations.

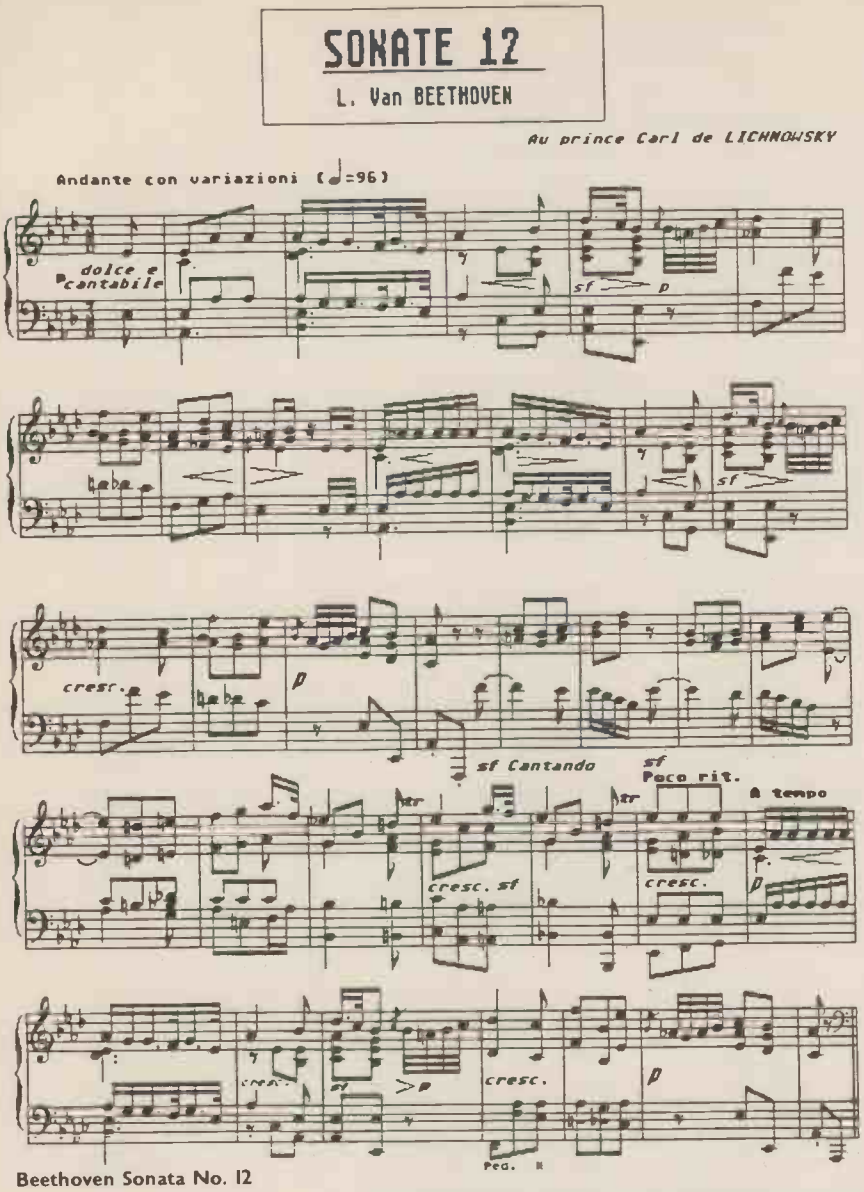
A consequence of Musigraph's graphic operation means that as you move a note above or below a stave, leger lines don't automatically appear. Neither is there an automatic beaming function: these must be inserted manually – and very carefully, too. It's quite easy to step "over the line" when inserting beams and lines and some sort of beaming aid would have been nice.

"A consequence of Musigraph's graphic operation means that as you move a note above or below a stave, leger lines don't automatically appear."

There is no automatic spacing option to give each type of note a proportional amount of space but there is a Justify function which can compress or expand a collection of notes. This needs to be used with care.

A couple of minor points: there is no facility to insert bar lines, you have to draw them yourself and ties must be entered manually. Actually this is no great hardship but I mention it to stress, again, the difference between a music-orientated program and a graphic one.

One facility I did miss was an arc routine for drawing



Beethoven Sonata No. 12

slurs and phrase marks, an odd omission for such a highly graphic-orientated program. There is, instead, a segment facility which lets you draw a series of straight lines without lifting your pen from the paper as it were. It's only slightly less convenient.

There is an option to input notes from a MIDI keyboard but this is really only useful for entering (up to six-note) chords. This method of input doesn't take into account any key signature you may have set, so playing F# in the key of G will produce an F with a sharp in front of it. To get a natural F (which will take its sharp from the key signature) you have to play F natural. A diagram in the manual shows a natural sign but there doesn't seem to be any way of getting one of these from MIDI keyboard input.

If you don't have a MIDI keyboard, the program will draw a picture of one at the bottom of the screen and you can select notes on this with the mouse.

Once recorded, the chord can be placed anywhere on the screen in best Musigraph fashion, but even this has its limitations, as a chord with a note designed to sit on a line, for example, can't be placed on a space.

I could really find no use for this method of note placement, although it may help anyone unfamiliar with stave notation.

Talking of MIDI, it will no doubt come as a great disappointment to many that the program is so heavily computer-based rather than MIDI-based. I was rather disappointed that it couldn't play back my carefully crafted scores, but then that's not what it was designed to do.

You can't load MIDI sequencer files for conversion and the program doesn't support the standard MIDI file format – there wouldn't be much point, really – but you can save the screens in Degas or Pluspaint format. This reinforces its role as a graphic editor and if any more confirmation is needed, look under the Graphics menu where you can select one of 40 patterns to fill any boxes you create.

The Printout

LET'S GET TO the printout. Musigraph loads with a printer driver which supports the Star NL10 printer. This seems to be Epson compatible and worked fine with my Epson FX80. You can create your own printer drivers although you'll need an ASCII text editor and have to dig deep into your printer's manual.

A driver is supplied for the Atari SLM 804 Laser printer but mine was tied up churning out bootleg copies of Music Tech for the Australian Yuppie market, so I was unable to try it. I suspect the resolution of the printout is a restriction of the screen resolution rather than the printer used but I could be wrong.

There are four print densities to choose from and a page can print in one of four sizes. Size can also be dependent on the printer driver in use. And the results . . . are excellent.

Les Franglais

ALTHOUGH DISTRIBUTED BY Steinberg stalwarts Evenlode, the software was written by French software house SARO Informatique Musicale. The review copy was version 2.1 and comes complete with a naked dongle – one without a case. Nuisance.

The manual was translated from the French by a Frenchman (or woman) and a little Franglais is in evidence. In particular it insists on calling Editing "Edition" and when it says you must tell the program if you are playing in the key of G or F it is actually referring to the treble and bass clefs – a consequence of a literal translation from the French.

It's a shame they didn't let an English man (or woman) loose on the manual before printing it. Franglais apart, it's pretty thorough, although a more tutorial approach would have ensured a more immediate familiarisation. I'll give it seven.

Verdict

THE NIGGLES I have are a result of the positive aspect of Musigraph's performance – a trade-off if you like. Perhaps it's asking too much of a CAD program to make intelligent decisions about such things as the insertion of leger lines and trimming off overlapping beams.

The positive aspects of Musigraph are there for all to see. You have virtually infinite control over the setting and layout and it's a control given to you without a mountain of complexities which are noticeable in some other scorewriting programs.

It took me a little longer than five minutes to work my way through Musigraph but it did turn out to be easy to learn. I was suitably impressed. If you don't need aural verification of your music via MIDI and want to produce versatile, quality music scores with the minimum of effort, then Musigraph will do an excellent job. ■

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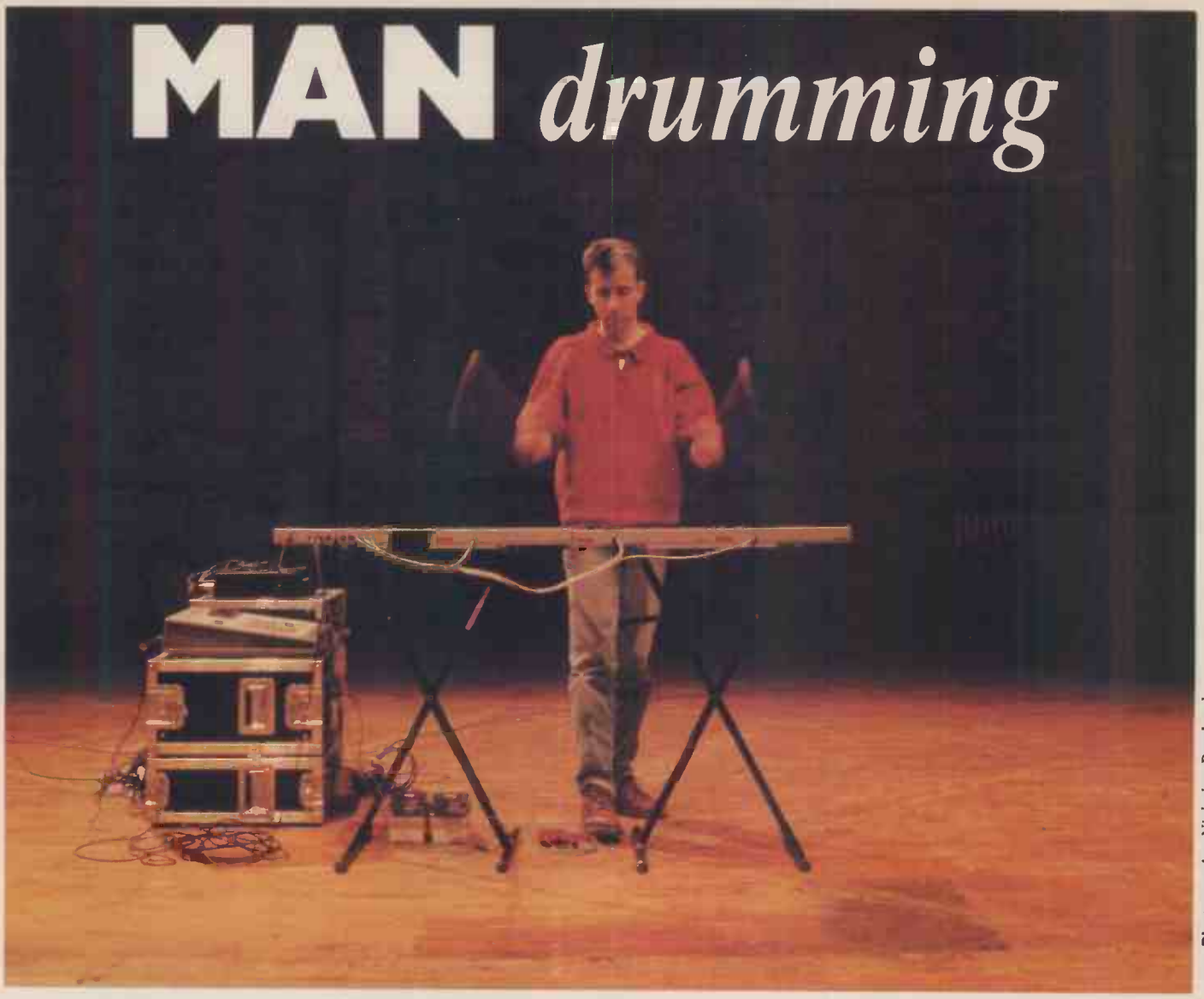

Photography *Nicholas Rowland*

Simon Limbrick is better known as the percussionist with Man Jumping, but recently he's been performing solo concerts using the KAT MIDI controller and the Akai MPC60. Interview by Nicholas Rowland.

IT'S A STRANGE thing, but as music technology becomes more sophisticated and accessible, the way people use it seems to become ever more mundane and predictable. Take MIDI; each month, the pages of this very magazine are full of news of the latest gadgets designed to allow musicians to tune in and turn on to the power of the five-pin DIN plug. Theoretically this should have given rise to a generation of MIDI maniacs who can not only play every conceivable type of sound, but, given the proliferation of MIDI controlled effects units, mixers and amplifiers, can also manipulate those sounds as part of a live performance. But where is this race of super beings?

Over the last couple of years groups like Man Jumping and Earthworks have emerged from the nightmare world of MIDI with their jazz sensibilities firmly intact. Less well-known perhaps, is the work that is currently going on within an area variously called 20th Century, avant-garde, contemporary chamber, or Contemporary with a capital "C". It shouldn't really come as a surprise though, as it's here that the traditions of electronic experimentation go back the furthest.

A good example of the type of eclectic musician operating in this area is Simon Limbrick. Probably best known as the rhythmist with Man Jumping, Limbrick is a versatile tuned percussionist who performs almost unceasingly on the Contemporary music circuit with groups such as the English Brass Ensemble, Music Projects London, Opera Factory, Endymion Ensemble, Capricorn, Lontano and Suoraan. He's also been active as a performer for the Society for the Promotion of New Music which organises regular concerts of mixed acoustic and electronic work.

Limbrick is a graduate of the Royal College of Music where, along with percussion, he studied electronics. Working his way up through tape-loops, manipulated feedback, contact microphones on typewriters, bits of metal and resonating tubes, he was eventually introduced to sampling, through the Fairlight.

Add to all this an interest in ethnic percussion (he's studied tabla for four years), plus a lot of hours spent behind the drumkit with various jazz and rock groups, and you've got someone with a rather more oblique perspective on the application of technology than the average DX7 player. Particularly so, since Limbrick uses not a DX7, but the KAT MIDI percussion controller linked to an Akai S900 sampler.

This system forms the basis for the electro-acoustic part of Limbrick's solo repertoire, which consists at present of two specially commissioned pieces, one from Vic Hoyland for KAT and acoustic marimba; the other, 'Asi el acero', by Javier Alavarez for steel drum and sequencer. Both these works, along with a third piece for KAT and sequencer, written in collaboration with fellow members of Man Jumping, were due to receive their premieres at the Almeida theatre back in April, as part of the

Percussion '88 Festival. Unfortunately, due to technical difficulties which will be explained later, only the Man Jumping piece made it to the final programme. (However, Limbrick assures me he'll be performing the others later this year.)

In the meantime, his explanation of what the audience *should* have heard offers an insight into the instrumentation involved and the problems of turning electronic scores into performance reality.

In Hoyland's piece the KAT is mounted behind and above the keyboard of a marimba. It triggers marimba samples from the Akai S900 which are then effected by a series of pre-programmed patches called up from a Roland DEP5 MIDI effects unit by the KAT.

"It's a bit like a 'prepared marimba'", says Limbrick with a smile, "since the basic samples stay constant and all the changes come about through effects.

"Unfortunately, although I'd spent a day with him showing what the KAT and the effects box were capable of, Vic didn't realise how easy it is to end up in a very complex area of programming even when you're only dealing with one effects device. By the time I'd got to grips with the material, there wasn't really time to do the programming."

Problems with programming also beset 'Asi el acero', although not because of any lack of technical knowledge on behalf of the composer. Mexican born Javier Alvarez is currently involved in computer music research at the City University and his previous electro-acoustic works, 'Temazcal', 'Luz Caterpilar' and 'Papalotl' have received much critical acclaim.

'Asi el acero' makes use of extensive sound treatment of the acoustic instrument. Firstly, the steel drum (the "lead" version) is miked up, while the two top notes, which wouldn't normally be heard with any degree of volume, each have a contact mic attached to the underside. These then trigger steel drum samples, again from the S900, which pass through different programs on the DEP5.

The score calls for the performer to play a series of intricate rhythmic patterns against those of the sequencer which is hooked up to a TX81Z and a second S900. Together man and machine produce an almost danceable rhythmic pulse which is full of constantly shifting accents and harmonies.

"The kind of material Javier produces for the steel drum is very challenging, which is partly why I wanted to get him to write a piece for me. So for example, as I kept getting the next few pages of the score, I realised how he was constantly throwing spanners in the works. The last section of the piece appeared on paper to be very similar to the earlier part – like a reprise or recapitulation in the classical mode. But when I started to play it, I realised that it was technically very different. In the end, though, after spending six weeks learning the notes, we were actually defeated in the last few days by the sequenced element of the piece."

IRONICALLY, THE PROBLEMS were partly due to the offer of the loan of an MPC60 sampler/sequencer/drum machine on the part of Akai, who sponsored the Almeida concert.

"Naturally I said 'Yes please' since it looked such a fantastic piece of hardware. Originally we'd planned to use something small and portable like the QX1, though eventually the idea is to transfer the whole lot to tape.

"Javier had written the piece on Macintosh Performer software which, as a composer working with notation, he finds more accessible and reliable and more suited to the way he records – usually in one long sequence, rather than stringing little ones together. He also tends to keep note information, program changes and controller information on separate tracks. So for this piece there was a single sequence of 212 bars of 5/4 with something like eight tracks of note events for the S900's and TX81Z and five tracks of other events.

"When the time came to pass all this across to the MPC60, we first found we couldn't do it as a bulk MIDI dump. So we ended up having to record each track in real time, which was a bit of a drag. Then on playback, we found the MPC60 refused to go past bar 129 – bar 129, beat four, to be precise – at which point the play button also seemed to stop functioning and the machine locked up. We spent the best part of a day trying to get round this, constantly phoning up Akai to see whether they knew what the problem was. In the end they said there was probably something wrong with the machine. The strange thing though, was that I'd used the MPC60 with Man Jumping and managed to get single sequences consisting of 350 bars without any problem.

"Probably what was happening was that the MPC60's note memory which is quoted at something like 60,000 is actually shared by other MIDI events. So although theoretically it should have been able to cope with nine minutes of music, all the other information meant it was running out."

Since there was no time to revert to the Macintosh and as Limbrick says "It was not a piece I could busk", 'Asi el acero' will have to ride again another day. Happily, for both Akai and Limbrick where the Man Jumping piece, 'Tokyo Mix', was concerned, the MPC60 proved a lot more useful.

"The way that piece was composed has a lot to do with the way that the group has now changed its focus and method of working", hints Limbrick darkly.

THOSE CHANGES HAVE been brought about by the decision of three MJ members to pursue solo careers. That leaves three remaining besides Limbrick: saxophonist Andy Blake and keyboardsmen Schaun Tozer and Glyn Perrin.

Limbrick takes up the story:

"We were left with four people who could just set up the instruments and play without having to talk about it, which was a real breath of fresh air. A lot of what MJ had done before has been rather precise and pure – too much of a 'product'. As a result we've got a bit of a reputation in magazines like this one for being the MIDI musician's MIDI musicians. I remember we did a tour last year and in the middle of a gig one person stood up and shouted, 'Why don't you make a mistake? Are you human or robots?'. Of course, we'd been making mistakes all over the place, but it sort of brought the point home. Technology had become this cloud we were living under, this sticky mud patch which we felt had to be part of the act.

"In order to try and get back some of the guts ▶

"Used in the right way sampling can make music seem a lot more human. The only use I see for factory sounds is to distort them into something else."

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▶ which we felt our music lacked, we decided to all go away for a week, set up the gear in a studio and just play. I'd just got the MPC60, so I took it along with all the other stuff, although no-one at that stage, including me, really knew what it did.

"For the first few sessions we just said 'no rules' and improvised. It was absolutely amazing what happened. All these different things which people had obviously had a sneaking desire to do suddenly came out. I was doing bass from the KAT, Andy was playing bass and pulse parts from the sax, Glyn was doing kit parts from the keyboard. Everyone was passing MIDI leads across asking to plug into other people's stacks. Absolute MIDI mania really, but not in that cautious way we'd been used to. Like we've all got effects devices but up to then we'd always been really careful about them. So many milliseconds this, so many milliseconds that. Suddenly you had these outrageous delays rocketing wildly all over the room, panning all round. It's quite a shock to listen back to the recordings we made. We're thinking of releasing them, but I think they'd lose us any following we ever had.

"At first I was using the MPC60 just by playing the drum sounds on the pads. Then I put these random pulse parts into it with different dynamics and panning effects. Over the top of that I put in a very light cross rhythm, very loose, but in 22 or 50 bar phrases and left out all the really big moments like bass and snare, so that it became more like a texture which people could interpret in any time signature they wanted.

"Later in the week I wrote this wildly developed bassline into the MPC60 then did some very loose percussion parts on top. Then I gradually lifted it into the next improvisation. After a couple of improvisations I dumped the MIDI information from each person's performance into the MPC60. We were still all playing simultaneously, but only one person was being recorded at a time. And of course, I didn't record my part as that was to be my contribution to the piece during the performance.

"I took the sequences home and chopped them up. There were basically two alternating sections throughout the piece which had slightly different rhythmic emphases and stresses to draw people in different ways. One section was shaped from something very small to a big crescendo, and I ended up chopping off the quiet bit and using it as a separate interlude which didn't go anywhere, and making the big section far more dramatic. I also swapped the voices around a bit so you heard a theme first on one sound and then on another."

'Tokyo Mix' is indeed a very exciting piece to hear played live, continually alternating between quieter more thoughtful moments and fast and furious steamroller sections. What impresses most is the quality of sound which Limbrick manages to produce using a small stereo PA system. The programming of digital effects is particularly stunning, showing off the quality of the sampled sounds to their best advantage.

The subject of sampling provokes various reactions from Limbrick. For starters, having spent so many years with the real McCoy, he's highly critical of the factory samples which the rest of us accept as tuned percussion.

"A lot of the time, it's quite clear that whoever samples these instruments doesn't really know what they are. They treat them as though they have a 'one-off' sound rather than like a piano, being capable of being expressive in all different ways. For instance, you often find that they've made what they call a marimba from only part of the range of the instrument, so naturally when it's out of that range the character of the tone is not right. They tend to be recorded at a low level too, so there's a fair bit of noise from either the line input or the output amplifiers. I found that problem myself when I did my own marimba samples on the Akai S900. In fact I've had to sample it about four times and it's still a bit noisy. But I have ended up with a very usable bass marimba sound which is in tune, unlike most acoustic bass marimbas."

So, if you are going to get into DIY tuned percussion samples, what's the secret?

"If I'm sampling something like a steel drum or a marimba, then I try to get as much of that sound into the reference file as possible. I go through the whole range playing a series of different types of notes – damped notes, long notes – all with different sticks. It's really a question of patience. I managed to create a brilliant set of crotales. They're really difficult because they ring on for such a long time, but after spending ages finding the loop points I got this sample which has all the harmonics, is touch-sensitive and again is actually in tune."

Aside from sampling large or rare acoustic instruments for the sake of convenience, Limbrick believes that the true value of the medium is as a starting point for something else.

"I've always believed the whole point of sampling is like an extension of a person's character. Used in the right way it can make music seem a lot more human. The only use I see for factory sounds is to distort them into something else.

"It's a principle we've always worked on in Man Jumping. And though we're constantly swapping new sounds within the group, the great thing is that everyone uses them in different ways. For example, on the Akai there's a master catalogue program which allows you to load all the samples across the keyboard so you can hear what's on disk. I'd done a whole disk of metal percussion sounds – triangles, sleigh bells and crotales. All Schaun did was to copy the master program and use it as it was mixed in with DX sounds. So when he's playing the keyboard, you'll get sleigh bells coming through on one note, a triangle on another, finger cymbals on another. We did that with a mixture of vocal sounds and MIDI'd it up with an electric piano so that you didn't know on which notes the vocal would come through under the piano. That was quite surreal – like the keyboard was melting."

If all goes well, the future will see MJ maintaining their unique approach to sound creation through a series of projects for dance, film, and life-size puppets. Limbrick intends to pursue his solo electronic experiments through further specially commissioned works. Eventually he hopes to collect them all together and record them, preferably on CD, though more for personal satisfaction than private gain.

In the meantime, expect to see him popping up in performances of Contemporary music wherever a percussionist is required. It's an area he continues to find exciting and challenging, despite the occasional obtuse work where as he says himself, the audience wouldn't know if he was hitting the right notes or the wrong ones. The audience, now there's another challenge . . .

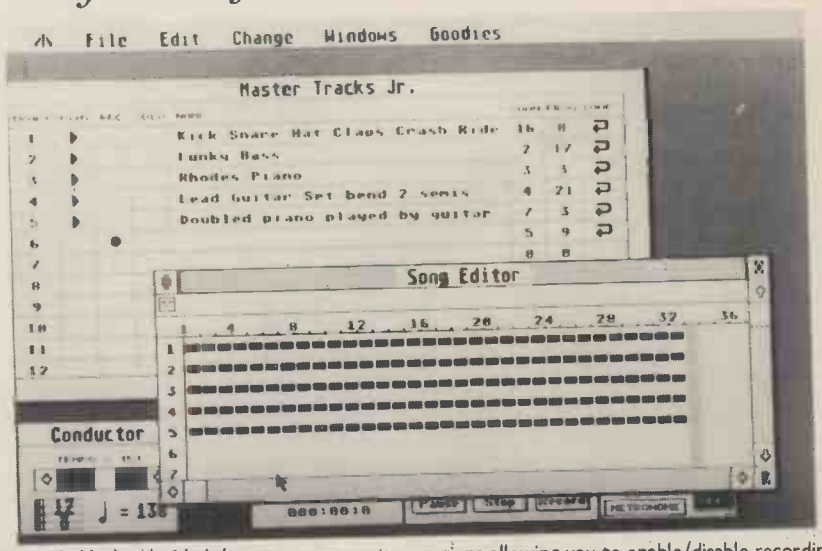
■

"We did a tour last year and in the middle of a gig one person stood up and shouted, 'why don't you make a mistake? Are you human or robots?'."

"We just said 'no rules' and improvised – suddenly everyone was passing MIDI leads across asking to plug into other people's stacks."

PASSPORT MASTER TRACKS JUNIOR

Software for the Atari ST



Photography *Lizzy Ellis*

Looking for a sophisticated sequencing package that won't burn a hole in your pocket? Passport's latest program is more powerful than its price might have you believe. Review by Simon Trask

LIFE CAN BE tough. You've decided that you want to get into computer-based sequencing. You've bought an Atari ST. Now, do you pay out a lot of cash for a sophisticated sequencing package which quite possibly has more features than you really want, or do you pay out not a lot of cash for a budget sequencer which doesn't quite give you everything you'd like. Clearly there's a middle-ground in terms of price and power which manufacturers have neglected – until now. US company Passport Designs, veterans of the MIDI software business, have released a scaled-down version of Master Tracks Pro which goes by the name of Master Tracks Junior and retails for £99. What is so impressive about Junior (apart from its parentage) is that, considering it costs less than half the price of the Pro (which retails at £250), it doesn't appear to lose that much in terms of sequencing power.

The most noticeable omissions are the Pro's grid-based step-time input, graphic controller-editing and SysEx librarian features. However, that still leaves you with 64-track recording in real- and step-time (Junior substitutes a more primitive step-time sequencer for the Pro's grid system) and a recording resolution of 240 clocks per quarter note. What's more, you can record multiple MIDI channels at once onto each track. Real-time recording is done from the Sequencer window, where you'll find a list of 64 tracks each with its own name, MIDI channel, initial patch number, mute and solo status and loop setting.

While many sequencers force the length of all tracks to comply with that of the first, Junior has independent track length and independent looping. Although individual tracks are rounded to a whole bar, it's possible to adjust the length of the track by rebarring and deleting any excess data. One point to bear in mind about track looping is that if you shuttle to a position beyond the length of a track, you won't catch the loop.

Each track can be given its own 31-character name, and if you're not using all 64 tracks (which is quite likely), you can use the name fields of the spare tracks as a notepad for further information on the song you're recording.

Passport's latest sequencer includes Record Filter options allowing you to enable/disable recording of notes, pitch-bend, channel aftertouch, poly aftertouch, controllers, modulation, and patch changes. You can also get Junior to quantise to any value as it records your ramblings, and to reject data on all but one MIDI channel.

Junior has four main windows: Transport, Sequencer, Song Editor and Conductor. You can open or close these at any time, size them, and position them anywhere on the screen. When you've decided on a screen layout which suits you, clicking on the Preferences option in the File menu allows you to save layout details to disk as a file; whenever you load Junior, the program will boot up with your screen layout. Only one window can be open at a time, however; you select the window you want by clicking on it with the mouse, or pressing a function key. A bit laborious, but certainly flexible.

Transport and Conducting

THE TRANSPORT WINDOW provides familiar tape-style transport control buttons together with a bar/beat/clock counter and an elapsed-time counter. To the right of the transport controls are buttons for punch on/off, Thru on/off and Thru channel, wait for MIDI keypress (which I couldn't get to work), auto on/off, count-in on/off and metronome on/off. With Auto turned on, each time the sequencer is stopped it will automatically "rewind" to the last playback start point, a handy feature if you're working on song sections.

Clicking on either Play or Record starts you from whatever position the counter is currently at, while double-clicking on the Rewind button zero-returns the sequencer. There are two ways to set punch in/out: either by typing in bar/beat/clock values in the Punch window or by highlighting a region in the Song Editor window using the mouse. If you then select Record, the sequencer will drop in and out of Record mode at the selected points. Junior appropriately shortens notes held over the drop-out location, but one strange anomaly occurs when you hold

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note(s) over which have been sustained for more than one bar: Junior truncates them to one bar in length.

The Conductor is an extra "guide track" which allows you to program as many tempo and time-signature changes as you need. These govern all 64 of Junior's tracks. Each new tempo can be absolute or a percentage of the current tempo, while you can also specify a smooth tempo change (up or down) between any two bpm values over any number of bars. The easiest way to handle the Conductor track is to set up a "template" track in advance of recording, so that your tempo and time-signature changes are already in place.

Songs and Steps

THE SONG EDITOR window provides an alternative display of the 64 tracks, which appear as 64 chains of one-bar segments. Filled-in segments indicate the presence of MIDI data, hollow segments indicate empty bars; the end result graphically indicates when different tracks are active or silent.

Junior provides up to 9,999 bars by 64 tracks of literal track data. How you divide this up is entirely up to you; for instance, although the sequencer can only hold a single Song at a time in memory, you could divide those 9,999 bars into any number of songs – so each time you load a Song you're actually loading an entire set (memory permitting).

A "ruler" across the top of the screen provides a bar-count, while musical sections can be highlighted by placing markers at appropriate positions in the music (complete with descriptive text). Once you've set your markers, you can advance through them by pressing the ST's Tab key, while Shift-Tab reverses through them. As well as marking out musical sections (verse/chorus) you could use them to highlight multiple songs.

Selecting a region for editing in the Song Editor window is simply a matter of highlighting it by dragging the mouse (the minimum region is one bar). Once you've done this, you can go to either the Edit or the Change menu and select the appropriate function. The Edit menu allows you to cut, copy, paste or clear the highlighted region, or to mix in data or insert blank bars. Junior uses a "clipboard" in the ST's memory to store data from a Cut or Copy operation (this can be a single track or any block of tracks). The Paste and Mix commands take data from the clipboard and place it at any position in any Track or Tracks (Paste overwrites existing data while Mix, as its name suggests, merges clipboard data with data in the highlighted region). In case you mess up on any of these operations, clicking on the Undo option at the top of the Edit menu cancels the last alteration you made; a nice safety measure. Another thoughtful touch is the Show Clipboard option; when selected this pops up a window which tells you the track range and bar/beat/clock start and end points of the data currently on the clipboard.

While the Edit menu provides you with word processor-style operations for moving or deleting blocks of notes, the Change menu allows you to adjust note duration, transposition, velocity and quantisation within a highlighted region. Duration allows you to set all note durations within the region to a fixed value (whole to 64th notes including dotted and tuplet notes) or to adjust the current durations by a percentage value (1-999%), while Transposition allows you to change the key of the selected region (which could of course be a complete song). Velocity allows you to set all note velocities (attack and/or release) to a fixed value, adjust the existing velocities by a fixed value or a percentage, or specify a smooth change from one velocity value at the beginning of the region to another value at the end of the region. Finally, Quantise allows you to quantise note on and off or just note on (with a resolution range of whole notes to 64th notes including dotted notes and tuplets). Normally, quantisation moves notes to the nearest quantise step, but with Junior you can specify in percentage terms how near or far a note can be from the step in order for it to be quantised to that step. Furthermore, by setting an Intensity percentage you can tell Junior how strictly it should apply its quantisation. You can also time-slide notes in the quantised region to clock resolution either ahead of or behind the beat, so you can create subtle shifts in the feel of a rhythm track, say.

If Junior has any shortcomings in the edit stakes, they lie in its inability to get *inside* a track and deal with specific MIDI channels, note ranges and types of MIDI data. It would also be useful if you could demix channels and note-ranges, but of course you can't always have your cake and eat it (I can hear the refrain even now, and it goes like this: "what do you expect for 99 quid?").

The Step Record window is no substitute for the Pro's grid editor, but it's certainly usable. Basically you select a note value (whole note to 64th note including triplets and tuplets) and then play a note or notes from your keyboard; Junior automatically advances to the next step when you release your hands from the keyboard.

The sequencer records velocity information along with the notes, and allows you to decide at each step whether you want the note(s) input to be staccato, normal or legato. Rests can be input by clicking on the Rest or Measure buttons in the Step display.

Junior provides a bar/beat/clock count to help you keep on course, and allows you to fast forward and rewind to any position in a track, where you can resume recording. The Step Editor is permanently in overdub mode, allowing you to build up complex parts within a track if you're so inclined.

Sync and File

WHEN SET TO internal sync, Junior sends out the full range of MIDI sync commands including song pointers. In external sync mode it responds to all these commands, and what's more interpolates its 240 clocks per quarter note based on the incoming MIDI clock rate, so you don't lose timing resolution. If you really want to be ambitious you can include a MIDI merge box in the input chain and record into Junior while slaving it to tape.

Selecting Import Files or Export Files from the File menu allows you to load and save music in the MIDI Files format. You get two options for saving MIDI files to disk. Type Zero files merge all channels onto a single multi-channel track; channel assignments are saved, but text, patch-changes, loop assignments and markers aren't. Alternatively, type One files save parallel multi-channel tracks, channel assignments and text and patch-change assignments, but again not loop assignments or markers.

Verdict

FOR A JUNIOR, this sequencer is pretty grown-up. It retains many of Master Tracks Pro's most important facilities while foregoing what could be regarded as the icing on the cake. Yet for £99 you're getting some pretty solid confectionery here. Quite simply, there isn't another sequencer that can hold a candle to Master Tracks Junior in its price range. I'm impressed, guv'nor. ■

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Why not go on our mailing list and write or telephone for your copy?

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Whilst we do not pretend to carry EVERY item from EVERY manufacturer, (*as some shops seem to!*), all new equipment is tested in one of our three working studios, and if we like it, our buying power can usually ensure that we have it in stock at all times (even when your local dealer might have run dry!). In addition, if we recommend an item, we will REFUND YOUR MONEY if you do not agree with us.

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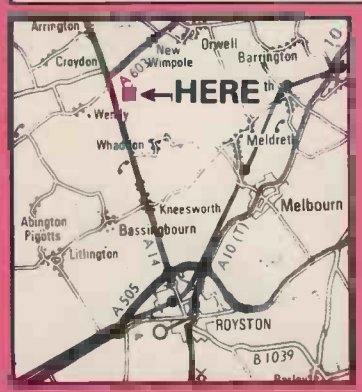

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CASIO CZ101 with RAM, £160; Roland SM09 mono, CSQ600 seq, £120. Wanted, FB01. Tel: Reading 693166.

CASIO CZ1000, home use only, as new cond, manuals, £200. Tel: 01-650 2930.

CASIO CZ1000, swap for Vesta Fire MR10 or Fostex X15 with MN15. John, Tel: (0322) 21545.

CASIO CZ1000 plus f/case, psu, etc, £220; Korg KMS30 MIDI/sync, £110; Boss DSD2 digital delay/sampler, £100. Andy, Tel: 061-792 0662, eves.

CASIO CZ230S plus computer equipment, total value, £750. Swap for Alpha Juno 2. Tel: (0609) 6479, eves.

CASIO CZ5000 synth, 8-tr seq with double X-stand, £575 ono, Cambridge area. Tel: (0763) 41865.

CASIO CZ5000 synth with seq, £400; Roland SH101, £85; FV200 volume pedal, £30. Tel: (0332) 381209, after 6pm.

CASIO CZ5000 multitimbral seq, £450 plus other recording equipment. Mark, Tel: 061-789 6022, after 6.30pm (Flat 4).

CASIO MT400V, £90; FM music expansion system for Commodore 64, £90. Tel: Maidstone (0662) 63909.

CHASE BIT 99, touch-sens MIDI analogue synth, £400 or offers. David, Tel: Worthing (0903) 33036.

CHASE BIT 99, vgc, very good sound, touch sens, split, layer, £340 ono. Tel: Dinnington (0909) 567151.

CHASE BIT 99 touch sens, programmable, poly, exc cond, £450 ono. Paul, Tel: (0782) 314448.

CHEETAH MK5 MIDI kbd (only 2mths use) exchange plus £300 cash for Korg DW6000, SCI MultiTrak or Akai AX73. Tel: Halesowen (West Midlands) 021-561 5765.

CHEETAH MK5 MIDI kbd controller, still under guarantee, £65: Upright piano, £120. Tel: 01-692 2264.

COMPLETE SYSTEM: MIDI Juno 6, MIDI OSCar, CX5, large keyboard, software, voices, CSI5 mono, Cobra 90 combo, Music Machine, stands, leads, books, etc, £1450, will split. Tel: 051-606 0221, after 6pm.

DIGISOUND 80 synth, 5-oct kbd, 10 modules, cabinet, amp, speakers, analogue seq, well made, £200. Tel: (0842) 62236.

EMS SYNTHI AKS, serviced, full literature, £450; Roland MC202 (new), £99. Tel: Windsor (0753) 865131.

ENSONIQ ESQ1 plus memory expansion, £950 ono; Yamaha Rev5, £925; Tascam 244, £450. Tel: 01-462 6261.

ENSONIQ ESQ1, mint cond, voice cartridge, seq expansion cartridge, etc, £700. Tel: (066 85) 360 (Northumberland).

FENDER RHODES Stage 73, vgc, £150. Mr Henry, Tel: 01-542 2071.

KORG DW6000, £375, good cond. Rudi, Tel: 01-438 4337, or (0227) 272455, eves.

KORG DW6000, exc sound, exchange for Chase Bit 99/Sequential MultiTrak or sell £450 ono. Tel: 021-561 5765 (West Midlands).

KORG DW8000, £550; Roland **TR505**, £150, both with cases, all in good cond. Tel: Portsmouth 814080.

KORG EX8000, mint, boxed, £550 ono; Casio CZ5000 plus 200 patches, boxed, £450. Ian, Tel: (0532) 580021.

KORG MONO/POLY four-oscillator monosynth with arpeggiator, ring mod. Doubles as pseudo-poly. Good cond, great sound, £135 ono. Tel: (0223) 314561, eves and weekends.

KORG MS20 plus manuals, £100. Must sell as upgrading! Rod, Tel: Watford (0923) 677922, eves.

KORG MS20 monosynth, 2XVCO, patchbay, process external sounds, pitch-voltage converter, £100. Tel: 01-552 2951.

KORG POLYSIX synth, manuals and 128 extra voices on tape, fair cond, £230 ono. Ron, Tel: (0482) 215464.

KORG POLY 61, 5-oct programmable synth, arpeggiator, some class sounds, mint. Andrew, Tel: Spennymoer (0388) 819913.

KORG POLY 61 and Teisco 100P, swap for Korg DW6000 or £350. Tel: Durham (0388) 81993.

KORG POLY 800 kbd, £230; Korg DDD1, £360; DDM220 percussion, £60, all vgc C.Y., Tel: 01-235 4697, after 7pm.

KORG POLY 800, boxed and in brand new cond, £250 ono. Can deliver. Tel: Reading (049 17) 242.

KORG POLY 800 with f/case, £240. Tel: 021-705 3246.

KORG POLY 800, £240; Korg Delta string synth, £100, both vgc. Lee, Tel: (0703) 556399.

KORG POLY 800II, built-in seq and DDL, f/case, boxed with manuals, exc cond, £345 ono. Tel: 01-946 1644.

MOOG MINIMOOG, £425; Poly 800, £275; Juno 6, £275, all f/cased. Tel: Stourbridge (0384) 372164, after 6pm.

MOOG MINIMOOG, mint, £400; Roland Axis 1, f/case, mint, £200, both have manuals, can deliver. Tel: (0473) 690357.

OBERHEIM OBX, great analogue poly, needs slight attention but bargain at £350 ono. Tel: (0531) 821434.

OSCAR plus f/case, home use only, £245. Dave, Tel: Hornchurch 44352, after 6pm.

PIANO,POLISHED MAHOGANY, baby grand, good tone/action, £1590; JBL 4502 professional manitors, £450. Tel: 01-866 2491.

ROLAND ALPHA JUNO1, £350; Yamaha TX81Z, £280, both mint. Write: M Nijs, 72 Danger Lane, Moreton, Wirral, L46 8UQ.

ROLAND ALPHA JUNOII, immac, boxed, £550 or p/x for DX7 and cash. Tel: Preston (0772) 323303.

ROLAND ALPHA JUNOII, immac, boxed, £550; TX7, immac, boxed, £295; 100W kbd amp, £100. Tel: Preston (0772) 323303.

ROLAND ALPHA JUNOII, boxed perfect, £550; Carlsbro Scorpion lead amp, 30W, £90. Tel: (0709) 546123.

ROLAND ALPHA JUNOII, touch-sens, easy programming, as new, home use only, £580. Tel: (0707) 43315.

ROLAND AXIS 1 MIDI kbd controller, f/case, manuals, mint cond, £250; Sequential SixTrak, mint, f/case, £200. Tel: (0473) 690357.

ROLAND 100M, £200; Roland system 100, £150; Roland SH2, £80. Tel: 01-685 0882.

ROLAND D50 plus ROM, RAM, pedals, nearly new, £1150 ono. Ros Wyatt, Tel: 01-497 2656.

ROLAND D50, mint, 11mth guarantee, £1100 plus Pearlcoder ROM sounds. Richard, Tel: 01-388 9265, eves (London area).

ROLAND D50 award-winning supersynth, boxed, 7mths old, guaranteed, ROM card, £1100. Tel: (0429) 276301.

ROLAND D50, £1100; Roland JunoII, £600; Roland **TR505**, £165, new cond, 2mths old. Tel: (0473) 686720.

ROLAND JUNO 6, f/case; Siel mono, DR110, vgc, home use only, £350. Paul, Tel: (048 93) 5215.

ROLAND JUNO 60 plus JSQ 60, £300; DX100, £200. Stuart, Tel: (0277) 62555.

ROLAND JUNO 60, perfect cond with manuals, data cassettes, very reluctant sale at £290 ono. Tel: Cheltenham (0242) 87204.

ROLAND JUNO 60, RS09, EP09; Drums, CR8000, TR606, TB303; Reverb RX100, first offer! Steve, Tel: (0602) 395338.

ROLAND JUNO 60, perfect cond, £270; OSCar, Odyssey wanted. Ashley, Tel: Cheltenham (0242) 87204.

ROLAND JUNO 106, immac, £350 or swap expander/rack sampler. Sound chips-Oberheim, DrumTraks. Tel: (0342) 23094.

ROLAND JUNO 106 plus f/case and extra sounds, £350. Tel: (0482) 801104 (eves).

ROLAND JUNO 106, brand new, boxed, cost £895, will accept £475. Tel: Chessington (391) 4142.

ROLAND JUPITER 6 plus stand, mint cond, service and operation manuals, £599 ono. David White, Tel: (0706) 877367.

ROLAND JUPITER 6, f/case, MIDI, split kbd, good cond, manual, home use only, £650. Mark, Tel: 01-531 5763.

ROLAND JUPITER 8, vgc, 16 VCOs, classic meaty analogue sounds, £525 ono. Tel: Peterborough (0733) 49472.

ROLAND JX3P, manual, box, good cond, £380. Dean, Tel: 021-458 4930.

ROLAND JX8, home use, £700; Marshall 30W combo base, £100; CBM64, £140. Steve Alker, Tel: (0707) 331051 (work) or (0462) 895261 (home).

ROLAND JX8P, home use only, f/case, box, manuals, immac, £600. Tel: Bracknell (0344) 779886.

ROLAND JX8P, £600; Yamaha FB01, £180; Casio SZ1, £100; Yamaha RX21, £100 ono. Tel: Worthing (0903) 504930.

ROLAND JX8P, £600; Korg Poly 800, £225; RX21, £125; SZ1, £110, boxed, exc cond. Tel: Worthing (0903) 504930.

ROLAND JX8P, programmer, cartridge, stand, ungigged, boxed, £675 ono. Tel: Bournemouth (0202) 534462.

ROLAND JX8P/PG800/cartridge. as new, boxed, £725 ono. Dave, Tel: (0992) 25270, eves.

ROLAND MT32, Cheetah MK5 (upgraded), £225. Both new, boxed, unwanted. Tony, Tel: Glastonbury (0458) 31444.

ROLAND MT32, the ultimate expander, only 6 weeks old, £365 to good home. Andrew, Tel: 01-954 6449.

ROLAND MT32, £390, boxed, manual, home use, perfect cond. Tel: (0276) 34466.

ROLAND MT32 expander, still boxed, £350; Yamaha REX50, little use, £295. Tel: (0992) 445308 (Herts).

ROLAND MT32, £380; Casio volume pedal VP2, £15. Yamaha REX50, £280. Gwyn, Tel: (0685) 811571.

ROLAND MT32 multitimbral module, new, boxed, £325 ono. Tel: 01-241 0458, eves.

ROLAND MT23 multitimbral expander, home use only, still guaranteed. Nick, Tel: 01-444 0411.

ROLAND MT32 sound module, new, boxed, manuals, £400. Tel: 01-682 1345, eves.

ROLAND MT32, boxed, manual, guarantee, plus Steinberg MT32 editor for Atari, £445. Darren, Tel: 01-648 8713.

ROLAND MT32, 8mths old, £375; Yamaha MTIX 4-tr, £290, both mint; Roland Cube 60 combo, list £400, £250 ono. Tim, Tel: Exeter (0392) 57152 (Room 1A).

ROLAND MT32 module, boxed, new, £325 ono. Chris, Tel: 01-241 0458, eves.

ROLAND MT32, mint cond, home use only, boxed, manual plus leds, £400. Tel: Rainford (0744 88) 3137.

ROLAND SH101, psu, manual, box, £80 ono. Iain, Tel: (0425) 616492, eves.

ROLAND SH101, psu, manual, £100; Casio CT202 kbc, £90, both vgc. Pete, Tel: (0784) 39430 (Room 2116).

SCI PRO ONE with UCI seq plus f/case, good cond, £250. Dean, Tel: 021-458 4930.

SCI PRO ONE, perfect cond, £120; Roland TR606, case, manual, psu, £75 ono. Tel: 061-798 9331.

SCI SIXTRAK, warm analogue sounds, reluctant sale, offers around £300. Tel: (027 360) 3601, after 7pm.

SEQUENTIAL PROPHET V with f/case, £450; Rev7 reverb, £550. Tel: 01-582 9254.

SEQUENTIAL PROPHET VS, extremely advanced analogue sounding synth, accepts sampled waveforms, £1395 ono; TR505, £130; Midiverb, £150. John, Tel: 031-346 7325, eves.

SEQUENTIAL MULTITRAK and OSCar, MIDI synths, £585, will split,

immac cond. Jill, Tel: 091-296 0202, office hours.

SEQUENTIAL SIXTRAK, home use only, perfect cond, £250 ono. John, Tel: 01-575 6437.

SEQUENTIAL SIXTRAK polysynth, vgc, home use only, £300 ono. Buyer collects. Tel: Brighton (0273) 603601, eves.

SOLINA STRING ENSEMBLE, £100; Moog Rogue synth, £50. Both immac. Tel: 01-710 3564, after 6pm.

YAMAHA CLP300, virtually new with manual, £1800 ono. R Wyatt, Tel: 01-497 2656.

YAMAHA CP80 electric grand, f/cased, £999; Roland chorus echo RE501, £250. Steve, Tel: (0754) 880680.

YAMAHA CS80 synth, beautiful instrument, fully working, £700 Sequential DrumTraks with manual, £250. Tel: (0732) 364881 (Tonbridge), eves.

YAMAHA CS60, beast of a polysynth, mighty sounds. mint cond, offers. Tel: Wolverhampton (0902) 343470.

YAMAHA CS30 dual-channel analogue monosynth, 2VCOs, 2VCFs, 2VCAs, noise, 5 EGs, 8-step sequencer, myriad modulation routings (ie. lots of weird noises!); one owner, inc manual, lead, £200. Trish, Tel: Cambridge (0223) 323397.

YAMAHA DX7, ROMs, manuals, 128-voice RAM, etc, inc stand, £650; RX11, £280. David, Tel: (079 14) 88888.

YAMAHA DX7, home use only, sounds, books, stand, £725 ono. Tel: Southampton (0794) 68004.

YAMAHA DX7S plus ROM, RAM, pedals, nearly new, £1000 ono; 128K RAM for DX7, offers. R Wyatt, Tel: 01-497 2656.

YAMAHA DX21, boxed, manuals, lovingly cared for, dust cover, mint cond, only 1yr old, £340 ono. Tel: (0223) 314561, eves and weekends.

YAMAHA DX21, perfect cond, tape, lead, manual, f/case, £475. Paul, Tel: 01-254 2026.

YAMAHA DX21, perfect cond, home use only, boxed, manuals, £450. Tel: Milton Keynes (0908) 542305.

YAMAHA DX100, immac, £250 ono or swap for Atari 520ST. Tel: (0841) 52037.

YAMAHA FB01, mint, boxed, £200; RX5, unwanted, new, £799, both with manuals. Steve, Tel: (0909) 771581.

YAMAHA FB01 multitimbral FM sound generator, as new, will post, £175. Christine, Tel: (089 275) 516.

YAMAHA KX5 remote kbd, £200 ono or exchange MIDI equipment. Neil, Tel: 061-626 0780.

YAMAHA MK100, carrying case, manuals, adapter, immac, £140 ono. Built-in everything! Karl, Tel: Aberdeen (0224) 642126.

YAMAHA MK100 electronic kbd, preset/programmable rhythm and synth sections, £80 ono. Tel: St Albans (0727) 37258.

YAMAHA PF15 electric piano, good cond, £485 ono. Tel: Sheffield 757757.

YAMAHA PS6100, 42 digital voices, 32 rhythms, custom drummer, 4-ch programmer, MIDI, offers around £475. Tel: 01-991 0060.

YAMAHA PS6100, £530 ono or exchange for multitimbral sytnh or sampler; Moog Prodigy, £80 ono. Tel: (0993) 843203.

YAMAHA PSR70, 7mths old, hard case, MIDI adapter, excellent, £600. Indra, Tel: (0509) 234562, after 6.30pm.

YAMAHA PSR70, immac cond, programmable rhythms, accompaniment, 32 voices, MIDI, only £420. Tel: (0325) 720319.

YAMAHA PSR70 MIDI kbd with soft case, adapter, manual, exc cond, £450 ono. Tel: (0255) 503552.

YAMAHA PSS470, boxed, as new with manual, 6mths old, £95. Tel: Bracknell (0344) 56210.

YAMAHA PSS560, as new, soft case, adapter, books, £130. Tel: Sheffield (0909) 563651, eves.

YAMAHA TX802 expander with extra cartridge, 3mths old, £850. Tel: Telford (0952) 506418.

YAMAHA TX816, £1995; Oberheim Matrix 6R, £475, plus other top name equipment, mint! Tel: (0935) 25333.

YAMAHA TX81Z, Steinberg editor, MC202, offers, or swap/p/x for MIDI drum machine, rack effects. Tel: (037 27) 26917.

YAMAHA TX81Z, ME50, DDD5, MC52, MDF1, KM602, £1500, no offers. Tel: Fulham 01-736 3798.

YAMAHA TX81Z, as new, £320; Yamaha RAM4 cartridge. Graham, Tel: (0928) 701852.

YAMAHA TX81Z, immac and boxed, extra programs, quick sale, £295. Eugene, Tel: 01-451 6287.

Sampling

AKAI S900 and crossfade looping software, as new, £1300. Paul, Tel: 01-751 0282, after 6pm.

AKAI S900, still boxed, mint cond, used about a dozen times, genuine reason for sale, £1300. Tel: (0909) 566695.

AKAI S700, 3mths old, £600; Yamaha QX21 seq, £110. Bruce, Tel: 021-706 8369.

AKAI S700, mint cond, boxed with manual, disks, genuine sale, £595. Tel: (0243) 821909 (Sussex).

AKAI S612/MD280, good cond, £350; Korg RK100 controller, offers. Tel: (0484) 681678.

AKAI S612 and disk drive, 10 exc samples on disk included, £350. Tel: (0268) 43815, eves.

CASIO FZ1 with sequencing disk plus other sound disks, home use only, £1080. Tel: (0562) 515846.

CASIO FZ1, new, with free library, mint cond, £955. Tel: 01-263 2854.

CASIO FZ1, vgc plus over 200 samples and 10 disks, £1050 ono. Richard, Tel: Frome (0373) 66504 (Near Bath).

DO YOU WANT an Akai S900? V2.1 software. Paul, Tel: 01-751 0280 after 6pm.

E-MU EMAX, exc cond plus disks. Tel: Guildford (0438) 578947, 8-9pm.

E-MU EMAX RACK plus £500 worth of sounds and day of instruction, £1350; Oberheim Matrix 6 plus editor plus 1000 American sounds, £650. Tel: 01-883 6753.

E-MU EMAX SE hard disk kbd, £1999; Ensoniq SQ80, £1250; Barcus Berry 402 enhancer, £210. Tel: 01-229 2723.

E-MU EMULATOR II with large library, £1995; Yamaha Rev5, £985; Fostex 450 mixer, £575. Tel: 01-462 6261.

ENSONIQ MIRAGE rack unit, guaranteed, full library, MASO5, £640; ISF-1, £70. Tel: (0286) 77205.

ENSONIQ MIRAGE kbd, disks, expander and stand, home use only, £650. Tel: 01-568 9840.

KORG DSS1 sampler/synth, 10mths old, f/case, disks, £1150 ono. Tel: Stubbington (0329) 668210.

ROLAND S10 plus 40 disks including pianos, Rhodes, guitars, etc, perfect cond, £575 ono. Tel: (0992) 445308 (Herts).

ROLAND S10, case, 46 disks, vgc, home use only, £550. Tony, Tel: (0222) 36036.

ROLAND S10 sampler, f/case, disks, stand, £550 ono; Fostex X15, £180 ono; Ohm Tramp combo, £75. Tel: 01-316 5043, eves.

Sequencers

CASIO SZ1 4-tr seq, psu, manual, boxed, vgc, £85. Tel: Oxford (0865) 711873.

ROLAND MC202, vgc, boxed, manuals, £85; Morley Pro flanger, vgc, £100. Tel: Luton (0582) 573187.

ROLAND MC500, £535; Roland TR707, £295, mint cond, Tel: Ruislip (089 56) 72768.

ROLAND MSQ700 8-tr MIDI seq, £250. Tel: 01-555 8765.

ROLAND PR100 digital disk drive seq, unwanted gift, £300 ono. Brian, Tel: Stevenage (0438) 723630.

ROLAND PR100, 17000-note capacity, 2.8" quick-disk storage, boxed, guaranteed, disks, leads, £340 ono. Tel: 01-856 5306.

ROLAND PR100 digital seq with disk drive, MIDI, immac, £245 ono. Tel: Hayling Island (0705) 462250.

ROLAND PR100, £350; Tascam Porta-One, £280, all ono. Gordon, Tel: (0935) 26502.

YAMAHA QX5 seq, boxed, manuals, leads, pedal, £149. Tel: 01-777 2372.

YAMAHA QX5 MIDI seq, 6mths old, perfect cond, only £200. Tel: (0206) 222475.

YAMAHA QX21, perfect, boxed, £140 ono; RX17 drums, perfect, £180 ono. Chris, Tel: 01-748 2767.

YAMAHA QX21, £150, no offers, immac cond, still boxed. Rick, Tel: (0532) 505359.

YAMAHA QX21, £150; Korg KM530 MIDI/sync/tape, £70. Both perfect cond. Bill, Tel: (043 02) 3204.

Drums

ALESIS HR16, Midiverb II, Microverb, Korg DS8, Casio FZ1, offers. Tel: (0926) 36668.

BOSS DR220E, as new, £80 ono. Garry, Tel: Coventry (0203) 610016.

KORG DDM110 drums and Roland MC202 synth/seq, perfect, £75 each, £140 for both. Tel: Woking 61297.

KORG DDM110 digital drums, immac, home use only, psu, lead, only £70. Tel: Chertsey (0932) 567614.

OBERHEIM DX drum machine, £250; Akai S612/MD80 sampler plus 14 disks, £360; Yamaha QX7 seq, £140. Dean, Tel: Swanley (0322) 63040, eves.

ROLAND CR1000 drum machine, digital, full MIDI, instant sounds, £200. Greg, Tel: 01-340 2414.

ROLAND TR505 drum machine, as new, still boxed, £200 but must sell this month. Tel: Redditch (0527) 44782.

ROLAND TR505, as new, box and manual, £170. Tel: (0689) 74633.

ROLAND TR505, perfect cond with box and manual, etc, £180 ono. Tel: Cumbernauld (0236) 727871.

ROLAND TR505, £175; Roland MSQ100 seq, £130; Roland Cube 60, £150, all immac. Paul, Tel: (0759) 72094.

SEQUENTIAL CIRCUITS drumtraks, MIDI, boxed with manual, perfect cond, £325. Steve, Tel: (0754) 880680/(0472) 812984.

SEQUENTIAL TOM with 2 additional cartridges, good cond, boxed, programmable tuning and volume, £250. Tel: 021-355 5009.

YAMAHA RX11 pro-quality drum machine, sounds great, £285; Mirage MkII, £675; DX7, £670, all good cond. Layton, Tel: (0273) 686420.

YAMAHA RX11, £275; Yamaha TX7, £275; Yamaha QX21, £125, perfect cond. Tel: 051-327 4866.

YAMAHA RX11, separate outs, £299; Vestafire digital delay, £99, both as new. Tel: (0562) 515846.

YAMAHA RX11, slightly chipped case but works perfectly, £250. Tel: 061-439 3951, eves.

YAMAHA RX15, mint, £190 ono; Tascam Porta One, vgc, £295; Ensoniq ESQ1, £995. Adam, Tel: (0533) 673815.

YAMAHA RX15, good cond, £150; Roland SH2 synth, good cond, £90. Mike, Tel: 01-733 3491, after 6pm.

YAMAHA RX21, mint cond, £110. Tel: 01-657 0725.

YAMAHA RX21, as new, only £110. Steven, Tel: 01-800 3661, 10-5.

Computing

BBC B MIDITRACK, Performer software and junction box by Electromusic Research, £50. Tel: Dublin 538523.

COMMODORE kbd, only 5-oct, new, offers invited. Tel: 061-980 6140.

COMMODORE 128, data recorder, manuals, programs, boxed, unwanted Xmas gift, £165. Martin, Tel: 01-622 5232.

COMMODORE 128, C-Lab, Supertrack MIDI interface, 1541 disk drive, £350 ono. Martin, Tel: (0268) 729139/765674.

CBM 64, C2N, joystick, many games, magazines, boxed, £130 ono or swap for Oberheim Prommer. Tel: (0823) 288737.

CBM 64 interface, full compatibility, £25 ono. Russell, Tel: (0432) 70649 (Herefordshire). Collect if possible.

C-LAB, used once, £220! Tel: 021-705 3246.

DMS MIDI SEQUENCER, MIDI, 5FG05, 8-voice multitimbral module, Sony HB75, £200. Tel: 01-805 0827.

DR T'S 8-tr MRS, CZ patch editor, £85. Tel: 01-882 6425.

DS/DD DISKS, 3.5", highest quality, branded, boxed, unused and no longer required, £19 for 10. Mike, Tel: (0707) 338531.

HYBRID ARTS EZ-Score, £60; Superconductor, £25. Wanted, Esquepade. Tel: (0272) 730732.

MUSIC 500 for the BBC B micro, used twice, must be sold, any offer considered. Tim, Tel: (0638) 667396.

SPECTRUM, MIDI interfaces, sequencing, sampling software, colour portable, £200; Yamaha DX27, £350 ono. Tel: (0666) 54391.

SPECTRUM+2 computer music machine, Specdrum, 48 games, 55 magazines, 2 joysticks, many extras, all exc cond, £200 ono. David, Tel: 01-697 3577.

SPECTRUM EMR MIDI interface and software, £40; loads of software including PAW, also 2 £40 amps. Tel: (0440) 83558.

SPECTRUM 48, green monitor, RAM music machine, DX21 voice editor, £100 ono for the lot. Clyde, Tel: 01-691 8227.

SPECTRUM 48K, S+ +2 keyboard, Specdrum plus 4 kits (32 sounds), Cheetah sampler, Alphacom 32 printer, Joystick interface, data recorder, leads, software, £158 ono. Colin, Tel: 061-905 1045.

STEINBERG PRO16, editor, TNS sync tape, £100; Roland Alpha Juno 1, £400; Yamaha R1000 reverb, £100. Tel: 01-574 5265.

STEINBERG PRO16, interface, Commodore 64, disk drive, £200; Korg DDM220 latin percussion, £50. Tel: (0708) 764218.

SYNTECH APPLE II II+, IIe MIDI interface plus mimetics Data 7 DX librarian software, £50 for both. Geoff, Tel: 01-340 7103, eves.

TURBO ELECTRON, Plus 3 drive (30 disks), ROMbox, View, exc cond, £165. Jon, Tel: 01-603 4907.

UMI 2B INTERFACE, series 5.01 software; professional 16-tr polyphonic for BBC, £200 ono. Tel: (0628) 71005.

XRI MIDI interface and sequencing software with 48K Spectrum, £70. Tel: (0727) 57251.

XRI MICON interface and step seq for Spectrum, £40 ono. Andrew, Tel: Rugby (0788) 822534.

XRI MICON software: ESQ1 librarian, £9; ESQ1 data dump, £7, both for £13. Tel: 01-540 5876.

YAMAHA CX5M, large kbd, voicing, Composer, sequencer, 400 voices, cassette recorder, vgc, boxed, £260. Tel: Bournemouth (0202) 889297.

YAMAHA CX5M, YK01 kbd, music, Composer and voicing software, £180 ono. Adam, Tel: (0703) 36268.

Recording

BOSS DE200 DDL, chorus, flange, sample, trigger, etc, case, £140. Chris, Tel: Bristol 775747

BRENNEL RECORDER, 1", plus remote, home use only, £980. Tel: 01-272 8344.

CARLSBRO PROFEX, ADRI dual spring reverb, ADT, multi-delay, all in one box, vgc, only £85. Tel: 061-620 0058.

FOSTEX A80, £1200; Fostex 450 desk, £350; Yamaha DX7, £700; RX11, £250. Patrick, Tel: 01-549 3837.

FOSTEX X15 plus psu and MN15 mixer, £180. Stuart, Tel: (0277) 625555.

FOSTEX X15, psu, battery pack, carry strap, headphones, mic, tapes, boxed, manuals, £180 ono. Darren, Tel: 01-595 3552.

FOSTEX X15 and psu, mint, less than 24hrs total use, £160. Jon, Tel: 01-603 4907.

FOSTEX 350 mixer plus meter bridge, £250; 2 Roland basslines, £50 each. Mik, Tel: Luton 38038.

HH MULTI-ECHO, delay plus reverb, 2

mic/line inputs, EQ, £50. Chris, Tel: Bristol 775747.

KLARK TEKNIK DN22 stereo graphic, £185; Klark Teknik DN50 dual reverb, £155. Tel: Sheffield 757757.

PATCHBAY, 104-way, ¼", high quality, £70. Clive, Tel: 01-299 0867.

RAM RM10 10:4:8:2 recording mixer, 48V phantom, will accept £375. Andrew, Tel: 01-954 6449.

REVOX B77, exc cond, 7.5/15ips, NAB, £650. Tel: (092 77) 66664.

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SOUNDTRACK COLLABORATOR wanted, with ideas, MIDI equipment to join ESQ1, TR505, CZ101, FX. Greg, Tel: Leicester 824029.

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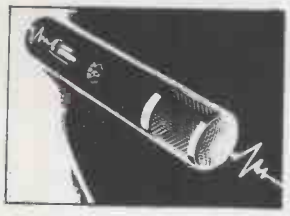

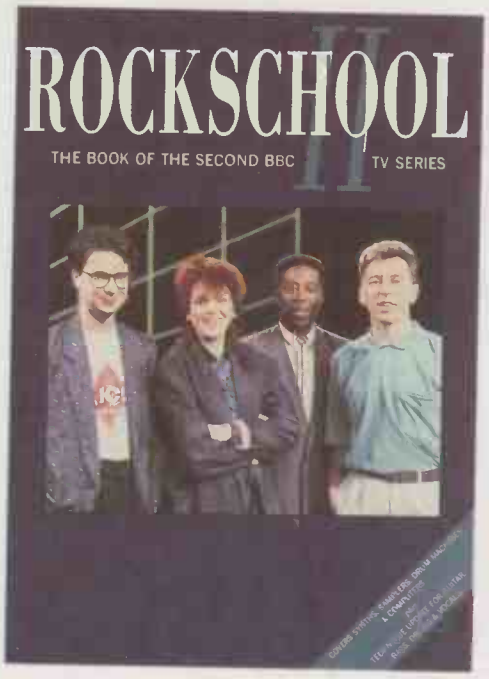

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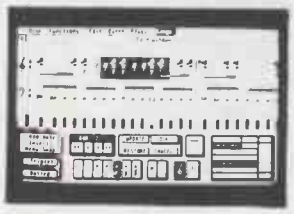

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