Electronics & MusicMaker
JUNE 1985 £1.20
INCORPORATING COMPUTER MUSICIAN

KEYBOARDS IN KING

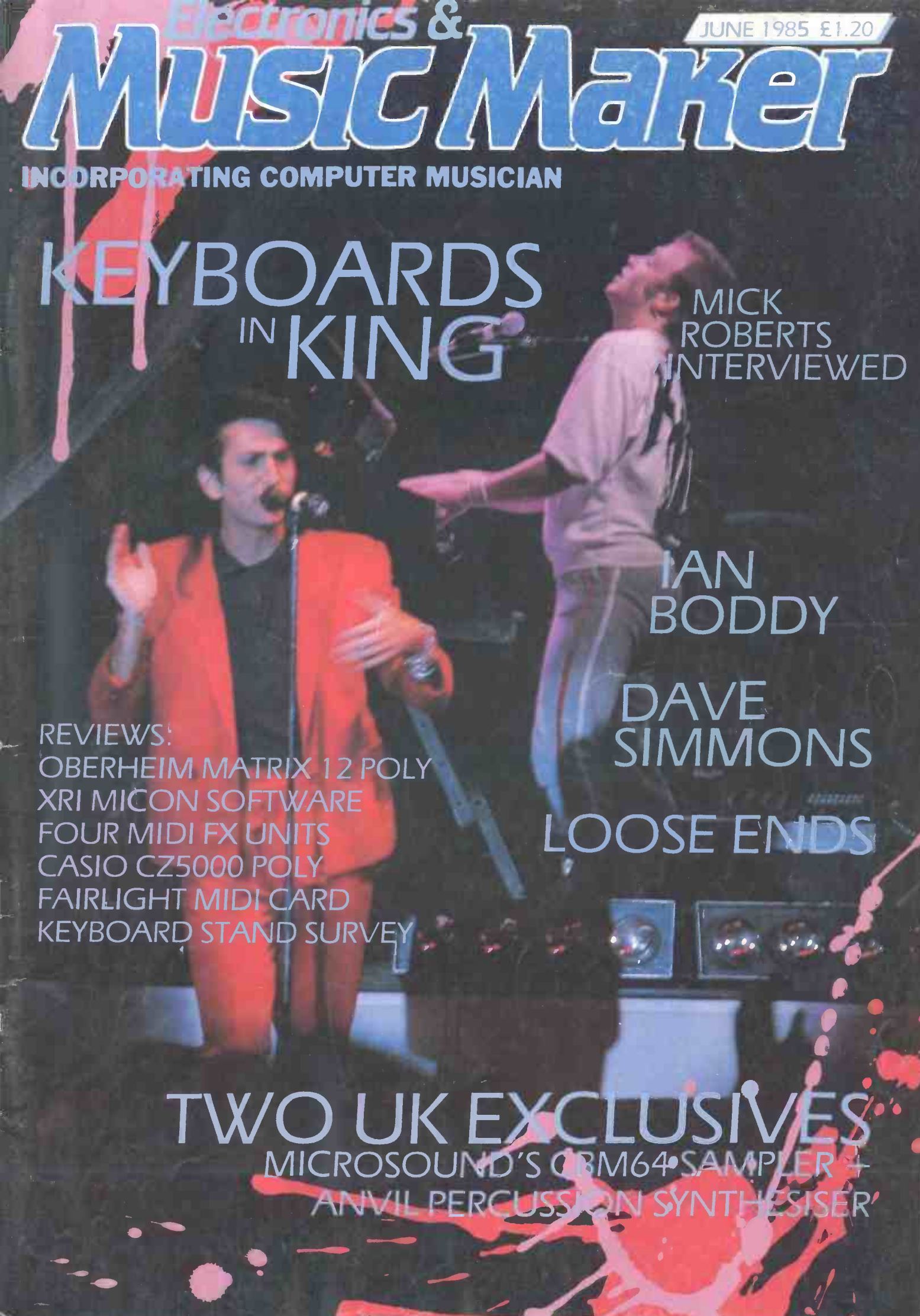
MICK ROBERTS INTERVIEWED

IAN BODDY

DAVE SIMMONS

LOOSE ENDS

REVIEWS:
OBERHEIM MATRIX 12 POLY
XRI MICON SOFTWARE
FOUR MIDI FX UNITS
CASIO CZ5000 POLY
FAIRLIGHT MIDI CARD
KEYBOARD STAND SURVEY



TWO UK EXCLUSIVES
MICROSOUND'S C64 SAMPLER
ANVIL PERCUSSION SYNTHESISER

JX-8P

IS

Velocity Sensitive

– controlling DCO pitch, mix and balance between DCO 1 & 2, VCF cutoff and VCA level.

Pressure Sensitive

– controlled vibrato, brilliance and volume

Each voice produced by 2 DCOs and 2 envelope generators

has

64 present patches and

can

store a further 32 programmable patches

Plus

a further 32 programmable patches in the
M16C memory cartridge

During performance – you can instantly call up a total of 128 patches – and edit them – with or without the optional PG 800 programmer.

Name your own patch and store the name in the memory – recall spells it out with the desired edited parameters on the fluorescent indicator display.

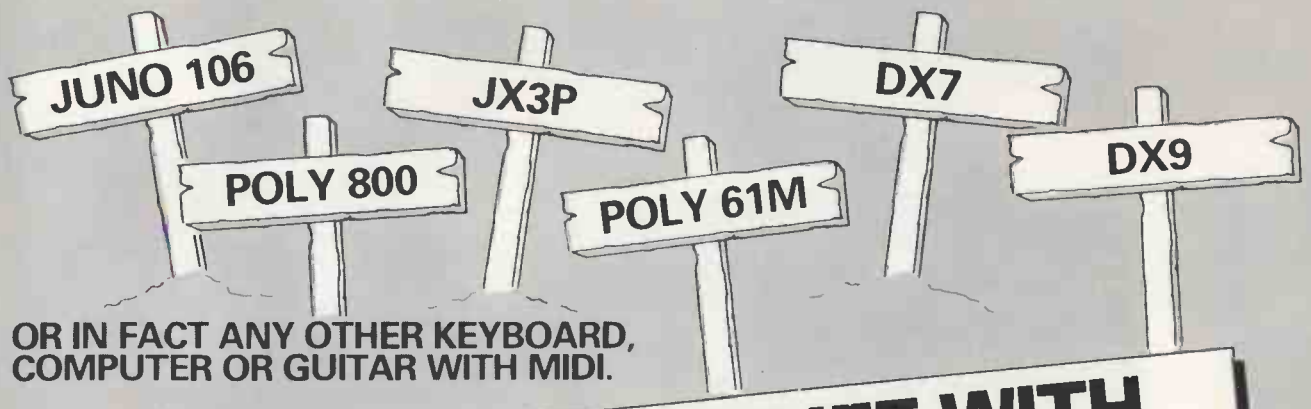
Patch chain function memorizes 8 combinations of patch/keymode pressure info/sound range/portamento/modulation/unison

Full MIDI compatability

Unique voltage controlled mixer to give more flexible percussive sounds, "wind instrument overblows" etc.

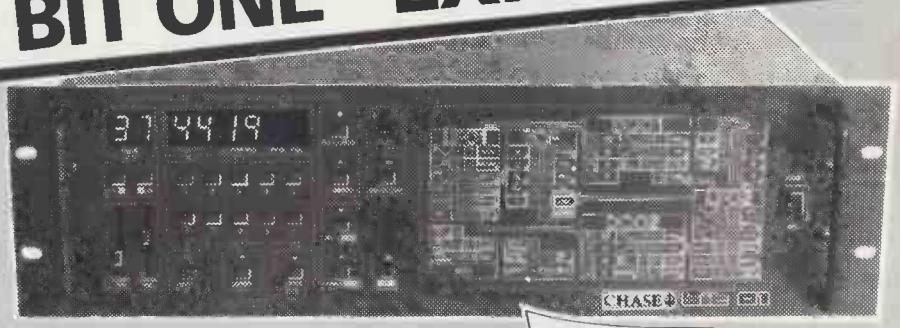
Roland

Roland (UK) Ltd, Great West Trading Estate, 983 Great West Road, Brentford, Middx. TW8 9DN
Telephone: 01-568 4578



OR IN FACT ANY OTHER KEYBOARD, COMPUTER OR GUITAR WITH MIDI.

BRING THEM TO LIFE WITH THE SENSATIONAL "CHASE BIT ONE" EXPANDER



If you've already a keyboard with Midi and digital filtering, now you've no need to throw it away to get those famous "Chase Bit One" analogue sounds. Now you can link it up to a "Chase Bit One Expander" that will give you virtually all the advantages of a "Chase Bit One" (with touch sensitivity if your keyboard has this feature.)

GET THE FULLNESS & WARMTH OF ANALOGUE FILTERING AND MUCH MORE...

- Full Midi implementation
- Digital access control
- 6 voice programmable
- 24dB filtering
- 99 programmable memories
- Full analogue filtering
- Full touch sensitivity response
- Full assignable split mode
- Doubling mode
- "Chase Bit One" Sound Park

...AND ALL THE OTHER FEATURES THAT MADE THE CHASE BIT ONE "THE PROFESSIONAL KEYBOARD OF 1985". – ONLY THE KEYBOARD IS MISSING.

If you haven't tried it yet – see into the future this week and find out how the "Chase Bit One" Performance and Composition System is turning the music industry upside down.

In the meantime you may be interested that it won't cost you an arm and a leg. The "Chase Bit One" Expander for the next two months only can be yours for £699 inc. VAT.

CHASE bit ONE

IT'S TAKING OVER

NEW NATIONAL DISTRIBUTION NETWORK

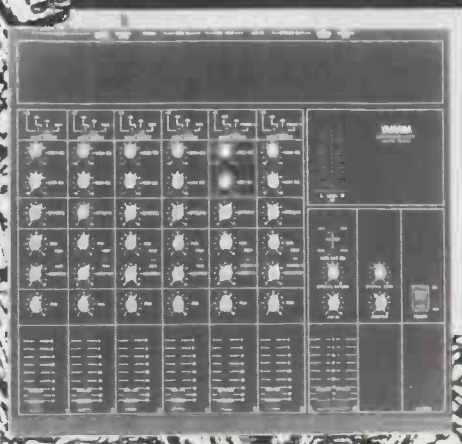
CHASE LONDON Chase, 22 Chalton St, Off Euston Road, NW1. Tel: 01-387 7626/7449
BIRMINGHAM Chase, 10 Priory Queensway. Tel: 021-236 8146
MANCHESTER - Chase, 58 Oldham Street, Off Piccadilly. Tel: 061-236 6794/5
BELFAST - Baird Sound System, 208 York Street. Tel: 0232-749358
BINGLEY - JSG Music, 104 Main Road. Tel: 0274-564389
CAMBRIDGE - Cambridge Rock Shop, 8 Burleigh Street. Tel: 0223-316091
CARDIFF - Livewire, 21A Penylan Road, Roath. Tel: 0222-496619
CROYDON - Rockbottom, 68 London Rd., West Croydon. Tel: 01-680 1042/681 0328
EALING - Tempo, 160 Broadway, West Ealing. Tel: 01-567 1994
EDINBURGH - Grant's, 53 Home St. Tel: 031-228 1704
GLASGOW - Grant's 404 Byres Road. Tel: 041-339 3618
INVERNESS - E.M.S., 14 Raining Stairs, Castle Street. Tel: 0463-234115
LANCASTER - Hobb's Music, Mary Street. Tel: 0524 60740/34443
LLANGENECH - Computer Music Studios, Park House, SA14 8YA. Tel: 0554 821310
PORTSMOUTH - Telecomms, 189 London Road, North End. Tel: 0705-660036
NEWCASTLE-UPON-TYNE - Rock City Music, 10 Mosley St. Tel: 0632-324175
SOUTHEND - Honky Tonk Music, 300 London Road, Hadleigh. Tel: 0702-553647
TORQUAY - City Music, 65 Market Street, Torquay. Tel: 0803 25488

CHROMATIX

CHROMATIX present the Yamaha modular recording system at a price you can afford!

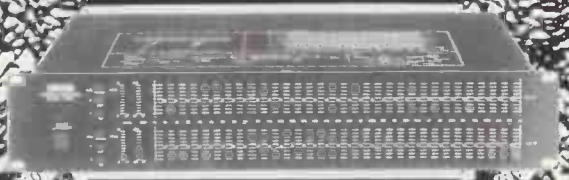
MT-44D recorder: new model, higher specification four channel multi-track. Superb design and construction permits hi-fi quality recordings with Dolby B and C for less than £400.

RM-602 mixer: total flexibility with this new design recording mixer. Simply the best unit for 4-track recording with the advantage of stand alone useage and higher quality components.

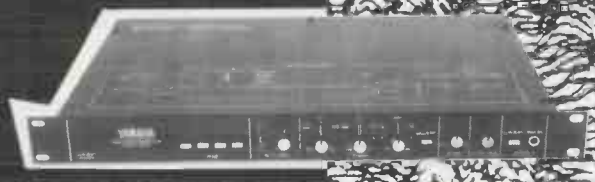


GC-2020 comp/limiter: Dual channel unit with expander gate on both channels. Dual mono or stereo modes, 20Hz – 20kHz frequency response and 0.03%THD. Amazingly low price in this no-compromise unit.

GQ-1031 and Q-2031 graphics: Precision response shaping from these two superbly engineered equalisers. At such low prices, the home-recordist can now enjoy frequency designed recordings which are so important to achieving optimum results.



R-1000 digital reverberation: Precisely controllable natural-sounding reverberation. Variable decay and on-board parametric equalisation with insert points enable your recordings to benefit from digitally simulated ambience at a lowest ever price.



D-1500 digital delay: This MIDI controlled delay system is, we believe, the best on the market. 16 memories with immediate switching from MIDI codes enable stunning results at mixdown or in real-time as you record.

OAK ROAD

EALING BROADWAY CENTRE

LONDON W5

01 567 3623

CONTENTS

E&MM June 1985 Volume 5 Number 4

NEWS

HARDWARE

CHECKLIST

MUSIC

Front cover photo: Tim Goodyer

TECHNOLOGY

COMPUTER MUSICIAN

COMMENT

Sex & Drugs & High Technology

Just who are today's average musicians? Where do they live? What do they do? And most important of all from our point of view, what do they want from a music magazine?

All the above are, of course, questions that defy accurate and unbiased answers. Yet that doesn't stop people – especially music industry people – asking them with monotonous regularity. There is no 'average' musician today, any more than there has ever been one. There are no average attitudes, no average lifestyles, and no average expectations.

But in spite of the huge diversity that currently exists among this country's music-playing population, there *are* some recognisable trends that nobody who makes their living from music can afford to ignore.

Perhaps the clearest of those trends is the one away from the 'I don't care how it's made so long as it sounds good' school of thought towards a more inquiring attitude. Increasingly, today's musicians want to know more than simply 'how does it sound?' They want to know how it's designed and built, how it compares with what else is available in the same market sector, how long it will take for its possibilities to become exhausted, and whether it's likely to be joined by interfaceable, interrelated products whose addition will extend those possibilities further.

And if anything, it's the last point that's the most crucial. As the march of technology grows ever quicker and more far-reaching, the average musician needs to know whether an instrument is equipped to take tomorrow by the throat, or whether it'll find itself on the scrapheap before you can say 'planned obsolescence'. Thus, what a musical instrument can do today has become less important than what it might do tomorrow. Nowadays, the key word is *potential*.

More than ever, today's average musicians appreciate that the more life there is in an instrument, the more sense it makes. And that's true not just of synthesisers, but of every section of the contemporary group gear market. Drums, drum machines, guitars, recording equipment – you name it, it's being given closer scrutiny by the people that use it than ever before, all of them searching for the product that'll weather the storm of progress best.

But it's because technology's race is being run at a faster pace than ever that the electronic and computer-based aspects of music-making are slowly becoming divorced from the others. Like it or not, hi-tech music is gradually but inexorably moving away from the group gear mainstream – partly because its inherent complexity demands a market tailored specifically for it, but mostly because the musicians involved with it are fast growing out of an industry whose structure is still much the same as it was 10 or 15 years ago.

Which, of course, is where E&MM comes in. Not so very long ago, you could draw a firm and rigidly-defined line between the magazine's two opposite sorts of reader. On the one hand, there were the seasoned professional musos or their younger, ever-hopeful successors, for whom the sound a keyboard made was valued slightly lower than sex, drugs, and making sure they ran off with the support band's share of the proceeds in addition to their own. On the other, there were the boffins. The men with little beards and long, white coats who would go from college research lab to home workshop with either a soldering iron or a bundle of computer printouts clutched firmly in their hands.

N'er the twain should meet, it seemed. But in 1985, that's precisely what they've done. Today's average musicians are just as likely to do their own electronics construction or write their own computer software as anybody else, simply because it's the surest way of ensuring technology doesn't get out of hand. And whereas, just a couple of years back, the idea of filling a music shop with a whole load of computers and VDUs seemed unthinkable, nobody bats an eyelid when greeted with precisely that sight in today's High Street.

Without wishing to do overmuch in the way of trumpet-blowing, I'd say E&MM was instrumental in bringing about the above transformation, if only because it stressed the importance of assessing an electronic keyboard in more lights than simply that of sound quality – at a time when the rest of the industry was still on about valve amps and fuzz pedals.

It's a policy we're continuing as each month goes by. Keeping abreast of technology comes first, sounding as good as the player next door a poor second, and sex and drugs don't even finish the course.

And that's the way things'll stay, until the average musicians, whoever they may be, decide they want another change of scene. ■

Editor *Dan Goldstein* **Production Editor** *Trish McGrath* **Hardware Editor** *Simon Trask* **Music Editor** *Tim Goodyer* **Technical Editor** *Paul White* **Consultant Editor (Computer Musician)** *David Ellis* **Art Editor** *Stuart Catterson* **Deputy Art Editor** *Eddie Allen* **Art Assistants** *Sam Masters, Sally Baker* **Photography** *Tim Goodyer, Matthew Vosburgh* **Technical Illustrator** *Len Huxter* **Consultants (Music)** *Warren Cann, Ian Boddy, Geoff Twigg, Paul Wiffen* **Consultants (Technology)** *Ken McAlpine, Jay Chapman, Steve Howell, Jim Grant, Paul Williams* **Advertisement Manager** *Tony Halliday* **Advertisement Production** *Shaun Barrett* **Accounts Secretary** *Sonja Betts* **Mail Order/ Subscription** *Cheryl May* **Director** *Dennis Hill* **Publisher** *Terry Day.*

Electronics & Music Maker is published by Music Maker Publications, Alexander House, 1 Milton Road, Cambridge CB4 1UY. ☎ (0223) 313722. Typeset by Goodfellow & Egan, Cambridge. Printed by Thomas Reed Printers Limited, Sunderland. Distributed by Magnum Distribution Ltd, London.
Subscriptions: UK £15.50, Europe & Overseas (surface) £16.20, Europe (airmail) £37.50. Binders: £3.95 (inc. postage).

Rod Argent's Keyboards

20 Denmark Street London WC2
Telephone 01-379 6690 (sales) 01-240 0085 (service)

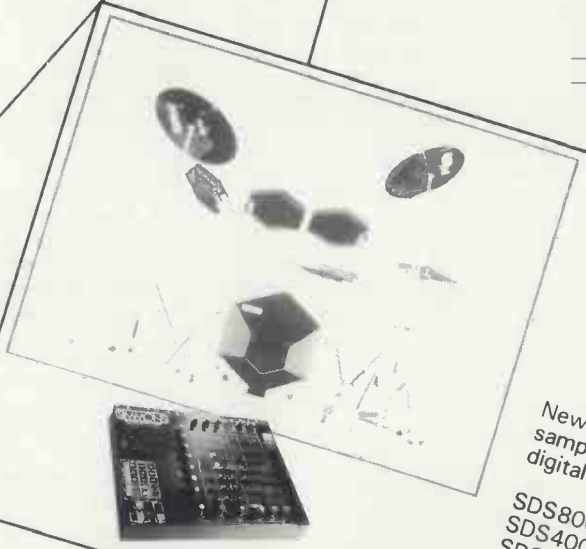
AKAI S612 POLYPHONIC SAMPLER

The new rack mount MIDI Sampler from Akai, incorporates, 12-bit sampling, velocity sensitive, six-note polyphony, switchable MIDI channels, between 0-8 second sampling, editing of sample, reverse facility, single or looping playback, ancillary products include quick disc storage unit MD280 plus a library of sounds.
Call for a demonstration.
P.O.A.

ENSONIQ MIRAGE-DIGITAL SAMPLING KEYBOARD

The world's first sampling keyboard at an affordable price,
Features include:
- Five-octave, 8-voice poly, velocity sensitive, with keyboard split.
- Two envelopes, comprehensive filtering.
- Pitch bend, modulation wheel + dynamic L.F.O.
- Totally MIDI enquipped.
- Sampling frequency response.
  2 sec/15 k
  4 sec/8 k
  8 sec/4 k
- Store samples on floppy disk.
- Comprehensive polyphonic sequencing.

AMAZING DEMO.



SIMMONS LONDON CENTRE

New pads with adjustable action—up to 3 snare samples—20 kit programmes—tape dump—digital delay—MIDI—more than a beat ahead.

SDS800 Snare, bass, 2 toms
SDS400 4 tom toms
SDS200 2 tom toms

On demonstration
On sale

Rod Argent's Musicstore

15 The Butts Worcester Telephone 611774

INTERFACE

If you've a view, query or problem relating to today's music technology, write to Interface at the above address.

We endeavour to answer every letter regardless of whether there's sufficient space for its inclusion in the magazine, so please include your full address and phone number, and don't worry if the reply is a little while coming; some queries need more research than others.

Sampling Defended 1

Dear E&MM,

I'd like to reply to Paul Walker's condemnation of sound sampling. Quite frankly, I think he's just as guilty of holding back musical ideas as the people he blames.

From his viewpoint (head firmly in sand) he sees exactly what he wants to see – all that's bad about sampling. Surely what most modern musicians are striving for is a source of fresh sounds? That doesn't mean discarding older analogue equipment in favour of digital – Jean-Michel Jarre still uses his ARP 2600 – but using the technology available to the composer to expand his range of tone colours. Who cares where the sound is coming from, as long as it's good for the song?

Personally, I don't lose any sleep wondering whether the 'wet slap' in the middle eight of Depeche Mode's new song is a Fairlight or a Russian wrestler's jockstrap played through a ring modulator. I either enjoy the song or I don't.

I would ask Mr Walker to listen to *Zoolook* again, and ask himself how many of the rhythmic vocal effects could have been created on a Pro One. He'll also hear that at no time does a sampled sound try to replace a real one – they're all sounds that fit their song and, as such, are abstract.

So let's all stop bickering about the source of sounds and get back to creating music.

Paul Ward
Sheffield

PS Anyone want to buy a cello?

Sampling Defended 2

Dear E&MM,

Just who does this Paul Walker guy think he is, trying to push sampling away from everybody with one sacred hand?

I say Mr Walker is scared that sampling will outdate his precious Pro One, and he hasn't the money to update it to a sampling unit. Well, neither have I, but I don't run away from the fact that digital sampling will eventually come up trumps.

He also said musicians were wasting money on Fairlight systems and the like when they could hire a real instrument for a fraction of the cost. Well, yet again, Mr Walker has his facts wrong. Using a Fairlight isn't simply storing something and playing it back – sounds can be modified, reversed and added together.

Yes, I know Mr Walker would probably retort that 'you can only do that on samplers costing more than £1000'. And perhaps he's right, but how much would a Pro One have cost just after the birth of analogue synthesis? I'd guess £1000 or so, if not more.

I agree with him that the old analogues will always be lurking about, but as for the Pro One having 'almost limitless possibilities', the answer is No. You'd do better to look to digital sampling for that one!

Tim Stevens
Hampshire

Sampling Defended 3

Dear E&MM,

Paul Walker may be one of those rare individuals capable of playing a full complement of orchestral instruments simultaneously. However, those of us who have enough trouble simply steering our digits around a keyboard find sampling extremely useful.

It's certainly a lot easier and cheaper to play a cello sample on a Powertran sampler than to pay a session cellist. I'm not denying the sonic mileage to be had from older equipment – I still use an EDP Wasp myself – but samplers allow me to make use of acoustic timbres that were previously inaccessible. As for having to pay £20,000 for a Fairlight just to sample – rubbish! There are add-on samplers for the Spectrum for under £150; E&MM has *reviewed* some of them! And at just over £500, the Powertran unit is truly wonderful.

And what about stage performance? The advent of digital sampling has allowed musicians to play sounds live that were previously impractical. You try carting a cathedral organ around!

As a supplement to – not replacement for – analogue or digital synths, the sampler is a real blessing, and personally I look forward to seeing polyphonic samplers come down in price.

Now to air my personal bias. Electropop is the worst thing to hit the music scene since punk. Endlessly repeated arpeggios held together by the same old 4/4 beat are no alternative to decent melodies and musical complexity. It's dull, unimaginative and unstimulating. Call me old-fashioned if you like; come back ELP, all is forgiven!

Crispin Wickenden
West Sussex

You're old-fashioned. Seriously though, Paul Walker's letter provoked a storm of written protests from readers. The above is just a tiny selection from the postbag-full we received. Of course, if you have any further views on the subject of sampling (be they inspired by the Walker letter, this month's submissions, or simply your own view of things), we'll be glad to consider publishing them in a future issue of E&MM. And the sampling saga isn't finished for this month, either...

Sampling Defended 4

Dear E&MM,

Being a proud owner of Datel's sound sampler, and having just read Simon Trask's review, I'm beginning to wonder if we're talking about the same thing.

For fifty quid I've been able to indulge myself in the hitherto unattainable delights of sampling. I bought the unit realising that, for the price, I wasn't going to get a Fairlight. Yet I was both amazed and delighted with the Datel's quality, its range of features, and indeed the very idea that I owned a sampler.

I think your reviewer missed the point that this unit was designed to enable ordinary Spectrum computer users/musicians to become involved in an area that had previously been beyond their means. Let's face it, the whole package set me back less than the cost of a half-reasonable piece of MIDI software. Now I'm only glad that I bought my DSS before reading your review, as I probably wouldn't have bothered otherwise.

For anybody wanting to have a go at getting something out of the basic principles of sampling – and have a lot of fun in doing so – you simply couldn't do better.

Simon Parkinson
Lancs

Simon Trask replies:

I think we're approaching the Datel from different angles. I did say it acted as a reasonable introduction to the world of sound-sampling, but at the same time, I'd be failing in my job as reviewer if I didn't point out its considerable limitations from a pro or semi-pro musician's point of view. Remember, those limitations don't become any less just because the system only costs £50. You're entitled to your opinion, of course, but I believe I made it clear just who the Datel is likely to appeal to, and in that respect, I can't have done it any injustice. ■

BONNERS

12A GROVE ROAD, EASTBOURNE, EAST SUSSEX

0323 639335 (6 lines – Telex)

Roland Main Dealer KORG® Key Centre

YAMAHA Hi-Tec Dealer

KEYBOARDS IN STOCK

YAMAHA HI-TECH DEALER FOR E. SUSSEX

YAMAHA DX5 New Model	June/July
YAMAHA DX7 Not due for replacement 1987	£P.O.A.
YAMAHA KX-88 Comprehensive M/Keyboard	£P.O.A.
YAMAHA TX-7 MIDI DX7 FM Expander	£P.O.A.
YAMAHA QX1 Digital Multi-track sequencer	£P.O.A.
YAMAHA KX-5 Remote MIDI keyboard	£199
YAMAHA TX-216 Rack Mounted FM Expander	£P.O.A.
YAMAHA TX-1 Single Expander Modules	£P.O.A.
YAMAHA PF15 & PF10 FM Digital Pianos	£P.O.A.
YAMAHA RX11 & RX15 Digital Drums	£P.O.A.
YAMAHA R1000 Digital Reverb Unit	£P.O.A.
YAMAHA D1500 16 Memory MIDI Delay Unit	£P.O.A.

CX5-ME MUSIC COMPUTER

YAMAHA CX5-ME Computer with YK01 Keyboard and YRM-101 Music Composer Programmer	£449
YAMAHA YK-10 Full size keyboard	IN STOCK
YAMAHA YRM 102, 103, 104 and accessories	IN STOCK
YAMAHA Real Time, Sequencer ROM	SEPTEMBER
YAMAHA RX Programmer ROM	SEPTEMBER
YAMAHA Sound Sampling Package	SEPTEMBER

ROLAND MAIN AGENTS FOR E. SUSSEX

ROLAND JX-8P Synthesizer	£P.O.A.
ROLAND Super Jupiter	£P.O.A.
ROLAND JX-3P Synthesizers	£P.O.A.
ROLAND PG-800 Programmer	£P.O.A.
ROLAND Juno 106, Synthesizers	£P.O.A.
ROLAND MKB 1000 Mother Keyboard	£P.O.A.
ROLAND MKS-10 Piano Expander	£P.O.A.
ROLAND MSK-30 Poly Synth	£P.O.A.
ROLAND AXIS Remote Midi Keyboard	£P.O.A.
ROLAND MSQ 700 Digital Recorder	£P.O.A.
ROLAND MSQ 100 Digital Recorder	£P.O.A.
ROLAND TR707 Digital Drums	£P.O.A.
ROLAND SDE 1000 Digital Echo's	£P.O.A.
ROLAND SDE2500 MIDI delay	June
ROLAND SRV2000 MIDI reverb	June
ROLAND SH-101 Synth+Hand grip	£225
ROLAND DR110, R/Units	£P.O.A.
ROLAND JC Amplification	£P.O.A.
ROLAND Cube & Spirit Amplification	£P.O.A.

KORG KEY CENTRE FOR E. SUSSEX

KORG DW6000, New Model	IN STOCK
KORG MPK-130 New MIDI Bass Pedals	IN STOCK
KORG Poly 800 Synthesizer	IN STOCK
KORG EX800, MIDI Expander Modules	£299
KORG 80-S Symphonic Piano with Strings	£699
KORG 80 Symphonic Piano	£599
KORG SDD-1000, Digital Delay with Sampling	IN STOCK
KORG DDM-110 Digital Drum Rhythm Units	£199
KORG DDM-220, Digital Latin Rhythm Units	IN STOCK
KORG PSS-50, Digital Super, Section	IN STOCK
KORG KMS-30 MIDI Syncronizer Box	IN STOCK
KORG KR55B, Rhythm Unit, 96 Rhythms	£175
KORG KM-8X, 8 Channel Stereo Mixers	£175
KORG MM-25, 25 Watt Powered Monitors	£125

CASIO MAIN DEALER

CASIO CZ101, 32 Memory Poly Synth MIDI	£P.O.A.
CASIO CZ1000, Full Size Keyboard Version	£P.O.A.
CASIO CT6000 Full Size Keyboard MIDI	£P.O.A.
CASIO CT410V, New Model Stereo	£P.O.A.
CASIO CT310, Full Size Keyboard	£P.O.A.
CASIO CT610 Stereo Model, Full Size K/b	£P.O.A.
CASIO CK500, Keyboard & Cassette Deck	£P.O.A.
CASIO CK100, Programmable, plus AM/FM	£P.O.A.
CASIO KX-101, Keyboard, Cas & Radio	£P.O.A.
CASIO MT-100, 768 Variable Acc/ments	£P.O.A.
CASIO MT-800 with Stereo Speakers	£P.O.A.
CASIO MT-400V, With Stereo Speakers	£P.O.A.
TECHNICS DP50 digital drums	£599
TECHNICS PV10 PCM MIDI digital keyboard	£499 (RRP £899)

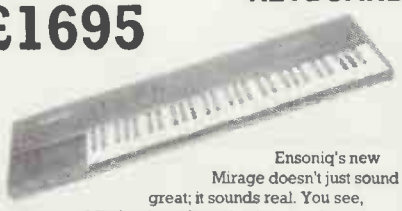
ADDITIONAL discounts for DX Owners Club members, please quote your membership number on all correspondence. Being a club member will automatically entitle you to many benefits.

ensoniq

MIRAGE

IN STOCK NOW £1695

DIGITAL SAMPLER KEYBOARD



Ensoniq's new Mirage doesn't just sound great; it sounds real. You see, Mirage doesn't synthesize sounds . . . it reproduces them. Note for note; timbre for timbre; resonance for resonance. From a concert grand to a thunder clap.

The Mirage has a velocity-sensitive keyboard that lets you control dynamics and timbre, so you can put more expression into your performance. And its simple keypad lets you customize sounds at the push of a button.

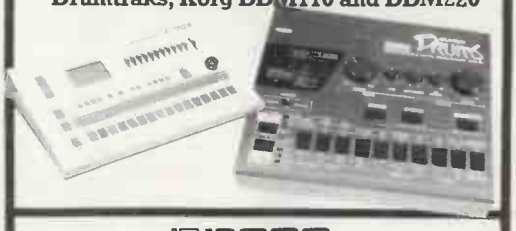
The Mirage is an 8-note polyphonic keyboard, so you can play up to 8 notes simultaneously. With up to 16 different sounds across the keyboard. And you can split the keyboard: piano on the lower half, strings on the upper, for example.

You control 77 different parameters of sound, including filtering, envelopes, and moduation. You can record musical phrases and overdub using Mirage's built-in sequencer.

But for the ultimate in creativity, you can sample your own sounds with the Mirage and save them on a diskette.

DRUM MACHINES

We carry a comprehensive range of Drum machines and Rhythm units including **Yamaha RX15 and RX11, Roland TR707 and TR727, Boss DR110, Drumtraks, Korg DDM110 and DDM220**



BOSS

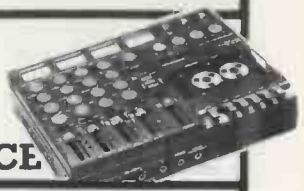
We carry the complete range of Boss pedals and our prices are the lowest

CARLSBRO SESSION

WE ALSO CARRY HUGE STOCKS OF ALL SESSION AND CARLSBRO EQUIPMENT AND CAN GUARANTEE YOU THE *BEST* UK PRICE

SECK IN STOCK

Tascam Porta One Ministudio BEST UK PRICE



- **£200 to £1,000 No Deposit, Interest free instant credit – 0% apr Subject to status – ask for written details.**
- **FREE UK DELIVERY – IMMEDIATE DESPATCH**
- **MAIL ORDER – ACCESS BARCLAYCARD VISA AMEX DINERS sales can be conducted over the 'phone. Bank drafts, Building Society cheques and postal orders will take 5 working days to clear before goods can be sent.**
- **FULL 12 months parts and labour warranty**
- **All prices include VAT (overseas buyers exempt)**

NEWSDESK

HARDWARE

Simmons are alive and well and adding to their product range with vigour. First, there's good news for those of you lucky enough to possess SDS7s, as a comprehensive range of accessories for that kit are to appear shortly. The improvements are: a new dual-sample bass drum module on which the sensitivity of the second sample may be programmed only to respond to harder strikes for the introduction of effects, and a snare that incorporates

rimshot sounds triggered from a second pickup in the same pad as the standard snare sound, for example. Then there's the trigger/MIDI interface with selectable dynamics, allowing all the manipulation MIDI implies these days, not to mention provision for triggering Simmons modules from recorded audio signals. An extensive library of sounds stored in EPROM is also on the cards for your delectation.

The **SDS9** is Simmons' all-new, mid-price electronic kit, and features sampled sounds held in EPROM alongside analogue synthesised sounds. The SDS9 is a nine-shell (nine-pad?) kit with bass drum, snare drum and three tom-toms. The snare incorporates three types of sound – snare, rimshot and cross stick – all derived from EPROM and triggered from the one pad, with all alternatives simultaneously available. The bass drum is also held in EPROM, but the toms are the traditional Simmons toms suitably upgraded to incorporate innovations such as a 'second skin oscillator'. Also included in the spec are tape dumping of programs, auto-triggering of sounds, programmable digital delay, extended playing dynamics, a MIDI connection and remote footswitch program-changing.

Further down the price scale, Simmons have repiaced their popular SDS8 kit with the **SDS800** analogue electronic drum system, with add-on units in the shape of the **SDS400** and **SDS200** electronic percussion modules.

On the sequencing front, the company have unveiled an extensive drum sequencing software package for the Commodore 64, and a custom-designed, dedicated MIDI drum recorder is also in the pipeline.

For more Simmons information, see *TechTalk*, page 61.

A six-channel programmable drum sequencer with 32-pattern programs and facilities for live overdubbing is **Tama**'s latest addition to the Techstar range of electronic drums. The Techstar TSQ1000 is the item in question, and will doubtless be the subject of a forthcoming E&MM review. In the meantime, further details can be had from *Summerfield, Saltmeadows Road, Gateshead NE8 3AJ.*

And then there was **Bel**, or so goes the press release... Anyway, their DDL/sampler is now capable of perpetrating 32-second samples whilst maintaining a 15kHz bandwidth. The sample can be triggered either internally or externally and may be played off any keyboard or sequencer with CV and Gate outs. For details and the name of your nearest Bel dealer, contact *Studio Equipment Distribution Ltd. ☎ (0582) 452495.*

TECHNOLOGY

The Music Department at the City University, London, is soon to launch a **Diploma in Music Information Technology**. The Diploma covers all aspects, both practical and theoretical, of the application of computers and microprocessors to music. The course is available in one-year full-time and two-year part-time forms, and is intended primarily for recent graduates in music, computing and engineering, and members of the teaching profession hoping to join the music industry. Further info from *The Administrator, Music Department, The City University, Northampton Square, London EC1V 0HB. ☎ 01-253 4399 Ext 3265.*

Meanwhile, Gateway Education Services and Rebis Audio Limited have joined forces to bring the **Gateway Multitrack Courses** to the Midlands from August '85 onwards, and more specifically to Rebis premises near Wolverhampton, with the first course destined to commence on August 12. Further information from *Gateway, ☎ 01-350 0340.*

COMPUTER MUSICIAN

U-Music have announced details of their UMI 2B MIDI hardware/software package for the BBC B. Replacement for the successful UMI 1B package, the 2B is a real- and step-time MIDI sequencer and interface possessing no less than four MIDI Outs as well as extensive syncing options, cassette and/or

disk dump of its own programs, and also DX7 banks/patches. Further info from the *London Rock Shops. ☎ 01-267 5381 and (0272) 276944.*

STOP PRESS

This year's **UK Electronica** is scheduled to take place at 1984's venue, Sheffield University, on Saturday August 24. The headlining act hasn't been confirmed just yet, but supporting acts include Altres, Mark Jenkins, Mike Brooks, Wavestar, Land of YRX, Ashok Preme, Ian Boddy, and Stevo. Further details from the organisers, *INKEY$, 50 Durell Road, Dagenham, Essex RM9 5XU.*

MUSIC 500 COMPETITION
February 1985

Congratulations go to Pete Upson, Surrey, winner of our recent Acorn Music 500 Competition; the winning 'Music Composing Package' gave the judging panel the impression its author had the sort of creative software-writing skill that would benefit specifically from the addition of a Music 500. Runners-up, and soon to receive a copy of *Creative Sound on the BBC Microcomputer* by David Ellis and Chris Jordan, are: D Billings, Oxford; R Cocker, Huddersfield; Graham Evans, Southsea, Hants; O Stevens, London W4; and S Wykes, Rushden, Northants.

E&MM FREE SUBSCRIPTIONS
Readership Survey 1985

Our thanks go to everyone who responded to our Readership Survey in E&MM January – your information has proved invaluable to the magazine, and will continue to be so for some time to come as we shape E&MM's future plans. Congratulations to the ten readers whose Survey forms were picked from the hat to win them a free year's subscription to E&MM. They are: J Ahrenbring, Sweden; D A Collins, Bradford; P Huggett, Wiltshire; T McEwan, Gateshead; T Nand, North Humberside; D Pullman, Surrey; B Roost, Southend; J Stevens, St Neots, Cambs; P Tetlow, Stockton on Tees; and S J Wallace, Brighton.

It's sad but inevitable news that **E&MM Back Issues** have been increased to £1.40 with immediate effect. Please note also that E&MM January '85 is now out of print, with other issues soon to follow suit... So if you've missed any issues recently – you have been warned!

Man and Machine, Stockton Parish Church, Stockton on Tees – June 7/8. *Mini festival of electronic music featuring Ian Boddy, Philip Mead, and music by Tim Souster, with the usual array of workshops, trade stands and demonstrations. Further info from Jim Easton ☎ (0642) 611734, or Douglas Doherty ☎ (0632) 784762.*

APRS, Kensington Exhibition Centre, London – June 12/13/14. *The recording industry's annual trade show, with tickets available direct from APRS, 23 Chestnut Ave, Chorleywood, WD3 4HA.*

The Over The Road Show, Tara Hotel, Scarsdale Place, Kensington, London – June 12/13/14. *New venue for this popular show running concurrently with APRS, with visitors welcome to gain hands-on experience of products on display. Don't miss the E&MM stand! Further info from Don Larking. ☎ (0582) 450066.*

British Music Fair 1985, Olympia 2, Hammersmith Road, Kensington, London W14 – August 2/3/4. *This year, the BMF opens its doors to the public for three days after the trade have had their three, and will play host to most major musical instrument manufacturers, importers and distributors displaying their latest musical instruments. Plus concerts, events and so on, and an unmissable Music Maker Publications stand. Ticket prices – Adults £3.00, OAPs and Children £1.50, MISM & MU members £2.00. Tickets on the door, or in advance (include SAE) from The Box Office, Earls Court Exhibition Centre, Warwick Road, London SW5 9TA. ☎ 01-373 8141. Cheques payable to Philbeach Events Ltd. See next month's E&MM for first part of BMF preview.* ■

Arts Council
OF GREAT BRITAIN

BURSARIES FOR ELECTRO-ACOUSTIC MUSIC 1985/86

The scheme is intended to help with the preparation of specific projects, or longer-term development of ideas within the electro-acoustic music area. Applications should be from musicians and composers working in England in the electro-acoustic music field.

The Scheme is not open to full-time students, nor is it intended to support full-time educational activities.

Application forms are available from:
John Muir, Music Officer,
Arts Council of Great Britain,
105 Piccadilly, London W1V 0AU.
Please enclose a stamped addressed envelope.

THE CLOSING DATE FOR COMPLETED APPLICATIONS IS 20 JUNE 1985

HARDWARE

Oberheim Matrix 12

Programmable 12-Voice Multi-timbral Polysynth

Oberheim's pricey but successful Xpander gets a velocity-sensing keyboard and a doubling of voices. Suddenly, words are not enough.

Simon Trask

When most manufacturers were producing expanders as keyboardless versions of already-existing synths, Oberheim surprised everybody by bringing out an expander with an entirely new spec. When the six-voice Xpander was unveiled at the 1984 Frankfurt show, a 12-voice version with keyboard was already taking shape at Oberheim's R&D labs. It took a while coming, but now that it's here, it looks set to affirm the Californian company's position as the premier makers of upmarket analogue polysynths.

The instrument in question is the Matrix 12, a 12-voice, touch-sensitive polyphonic synthesiser that employs the same hardware and software sound-generating elements as the Xpander module, and also shares most important design principles. So much so, in fact, that current Matrix documentation comprises an Xpander user manual and a brief Matrix 12 introductory guide.

A quick comparison between the Xpander and Matrix 12 front panels reveals that Oberheim have retained the former's highly successful design layout, with just a few modifications necessitated by the difference in number of voices. The block diagrams at the right of the panel tend to be a bit off-putting at first glance, but they do in fact provide a wealth of information about the structure of each voice, how that structure is accessed *via* the LED displays, and which elements of each voice can be subjected to modulation.

Sound Generation

Basically, each voice comprises two VCOs, a multimode VCF, two VCAs, five Envelope Generators, one FM VCA, five LFOs, three Tracking Generators and four Ramp Generators. Of these, only the two VCOs, VCF and two output VCAs are hardware, with the remaining features being implemented in software to control the hardware. Now, while the hardware elements are arranged in a fixed configuration, the software bits and pieces can be arranged in any order you might wish to contrive. If you like, you can set them to control each other or even themselves. The source of this flexibility is Oberheim's Matrix Modulation system (of which more anon), which is probably best explained as a modern-day software equivalent of the vast, sprawling synth patchbays of yesteryear.

Anyway, for those of you who missed Paul White's review of the Xpander (E&MM September 84), I'll quickly run through Oberheim's version of what a top-end analogue synth system should contain.

Each VCO is capable of generating triangle, sawtooth and pulse waves individually or in combination. Pulse width is adjustable, and VCO2 has an additional Noise input which may be mixed in. It's possible to sync VCO2 to VCO1 (ie. give it the same pitch), in which case changing the frequency of VCO2 produces a change of timbre. In fact, the frequency of both VCOs is adjustable in semitone steps over a five-octave range, a Detune function is also available, and each VCO has its own VCA.

Moving on to the filter section (isn't it wonderful, getting back to familiar analogue systems?), the Oberheim's multi-mode filter allows selection of any one of 15 filter modes, covering one-, two-, three- and four-pole versions of all filter types, plus selected combinations of these. In other words, a uniquely comprehensive filter section that only adds to the Matrix 12's programming desirability. Frequency and resonance of the filter are, of course, programmable, while the final stage of the hardware link is provided by two master VCAs.

Additionally, it's possible to configure the two VCOs in a carrier/modulator relationship for simple FM effects (though don't fool yourself into thinking you're going to get DX7 sound potential as a bonus feature – you aren't), with destination routable to either VCO2 or the VCF.

Other software-implemented elements of *each* voice include five Envelope Generators, each with their own initial output level. These are five-stage envelopes, adding an initial Delay (max 2.5 seconds) to the familiar ADSR configuration. Longest attack time is around 16 seconds, while the longest release runs to about 90, which should be enough for almost everybody, eccentric remix engineers included. And as if that wasn't enough, Oberheim claim that setting *all* the Envelope times to 63 (their maximum value), modulating each of them with a Tracking Generator set to 63, and switching on Freerun and DADR triggering modes results in an envelope cycle that runs about half-an-hour in length. Sad to say, though, I didn't actually check this to be accurate; pressure of deadlines, and all that.

But we still haven't finished. The remaining items are five LFOs (with programmable speed, waveform, and amplitude), three Tracking Generators (which enable various parameters such as filter frequency or amplitude to be tracked according to keyboard position), four Ramp Generators (for setting an overall 'rate of increase' for VCO1 or VCF frequency, say) and a Lag Generator (for portamento effects). Lastly, a number of triggering options (eg. single, multiple and external) are assignable to both the Envelope Generators and Ramp Generators.

Modulation Routing

This is it. Computer technology's answer to the spaghetti-heap wiring nightmare beloved of Tangerine Dream in days of yore. Its name? The Oberheim Matrix Modulation system.

For every parameter that can be modulated on the Matrix 12, there exists a Modulation Page. Each Page allows up to six modulation sources, each with their own modulation amount, to be assigned to any one destination parameter. And you can select any one of 27 different destinations simply by pressing the appropriate button in the Modulation Source/X Select section on the front panel. A maximum of 20 modulation sources is permissible for each voice.

Possible modulation sources include two levers, two pedals, attack and release velocities, and any of the Envelope Generators, LFOs, Tracking Generators and Ramp Generators.

A particularly handy feature – and one new to the Matrix – is the inclusion of a Modulation List for each single patch. This enables all currently-assigned modulations to be viewed as one sequence, and quick alterations and deletions to be made in real time. But there are two problems here. First, the modulation source can't be changed from this Page, and second, if you exit and then return, you don't re-enter at the point you left. Damn silly, if you ask me.

Any modulation can be quantised into semitone steps, and modulation sources can either add *or* subtract from the initial value (for a rise or fall in amplitude, pitch or filter cutoff frequency, for example). For something a little more dramatic, modulation sources can be directed to a destination more than once; an envelope Delay stage could be given greater duration in this way. And as if 20 modulations per voice wasn't enough, Page 2 of the VCO and VCF sections allows further modulations of pitch and cutoff frequency. That should keep you quiet for a month or two...

But no matter how many words you use to describe the Oberheim's range of modulation options, they simply aren't sufficient to do justice to what is in essence an open-ended system. As a result, it's unlikely to meet its match in terms of a programmer that can exhaust its potential, even if some of its more obscure possibilities aren't necessarily going to be of much musical value.

I mentioned levers earlier on, and these black plastic contraptions are what Oberheim consider preferable to the now almost universal pitch and mod wheels. And the choice is a happy one. The levers are a lot easier to operate in tandem, and as a player more than used to wheel configurations (a situation an awful lot of players now find themselves in, I'd guess), I found getting acclimatised to Oberheim's system a surprisingly painless process. The only thing they could do with is some sort of serated top to make them easier to grab hold of, but that's a small point, really.

Voice Orchestration

One of the strongest features of the Matrix 12 (potentially, at least) is its ability to 'map out' voices on the keyboard by means of what Oberheim call 'zones'; because Oberheim's approach goes well beyond the split-keyboard and dual-voicing implementations of so many other instruments, and the Matrix 12 has no fewer than six zones to be exploited by the lucky user.

Each zone can be defined as encompassing any area of the keyboard, from as little as one note up to the entire MIDI allowable range (which effectively allows the physical range of the keyboard to be much larger than it is). Each of the Matrix 12's voices may be assigned to any single zone, and as each voice can be assigned its own patch and the zones may be overlapped in any fashion, it's possible to build up a bewildering array of multi-timbral 'palettes', the sheer scope of which defies description.

Once you've assembled a specific configuration to your satisfaction, the Matrix 12 has capacity for storing 100 of them; it's these palettes that become Multi Patches in OberheimSpeak. Further refinements, all multi-patch specific, include volume, stereo panning and transposition settings for each voice, while each zone can be assigned its own voice mode, allowing monophonic or polyphonic playing with various sorts of note priority.

The icing on the cake is that both single and multi patches can be combined in a 100-link chain, which has got to be good news for anyone contemplating live use of a Matrix.

Sounds

And so we come to the stock factory patches. The 100 Single patches are organised into 10 groups of 10 allied sounds, and these are titled Brass, Strings, Pianos, Rhythm Comps, Symphonic Ensemble, Pitched Percussion, ▷

Basses & Leads, Percussion, Effects and First Impression. Presumably, the last group is intended for shop demo purposes.

Most impressive are the Strings and Symphonic Ensemble sections. The string sounds don't have the attack or the clarity of Yamaha FM strings, but then that's not what Oberheim's programmers have set out to achieve.

Generally weakest are the Percussion sounds (a bit of careful tweaking on the user's part would no doubt make them a mite more presentable), but by contrast, the Pitched Percussion sounds are a delight. Ringing FM sonorities put in an appearance on such sounds as 'Bello' and 'Carrilon', while one of the E&MM staff favourites, 'St Happi' (where *do* they get these names from?), sounds like a room full of striking clocks out of sync with one another, and plays itself endlessly as soon as you press a key. I always wanted an easy life...

What's really daft is the way the preset multi patches don't quite cut it the way the single patches do. Daft because as we've seen, multi patches give you a lot more in the way of programming scope than their single brethren. But it seems Oberheim's programming staff haven't really come to grips with the system's inherent potential, and as a result, many of the combinations are decidedly unimpressive.

There are a few gems, though, like 'Jazztrio', 'Ode 2joy', and 'Lead Wah', which applies multiple modulations to Lever 2 to give a pretty realistic Hendrix guitar sound, complete with wah-wah and feedback. I kid you not.

Keyboard Sensitivity

You might have a whole load of truly wonderful multi-timbral textures at your disposal, but will the Matrix keyboard allow you to use them to their best effect? Well, thankfully, this particular Oberheim keyboard is touch-sensitive on all three counts, ie. attack velocity, pressure (also known as after-touch), and release velocity, though pressure sensing is currently readable only *via* MIDI, which is a pity. Keyboard-based pressure sensing will, according to the Operation Guide, be available as a retrofit *at no charge* in the near future, so that's some consolation, I guess.

Five keyboard velocity scales are assignable for both attack and release velocities, so you can adjust things finely to suit your own touch. And as if that wasn't enough, individual scales can even be set to act upon MIDI input data.

Thanks to the Matrix Modulation system, velocity and pressure values can be used to modulate almost any parameter of a Matrix 12 voice. So for instance, as well as the more usual amplitude and filter frequency assignments, you can choose to modulate FM amplitude, lag rate, LFO speed, and VCF resonance. Hearing is believing.

Page Editing

Given the complexity of all these modulation options and possible zonal configurations, you'd be forgiven for thinking that the Matrix 12 is a beast of an instrument to do *anything* with. Fortunately, this isn't the case.

The aforementioned block diagram of voice organisation, which takes up about a third of the front panel display, gives a breakdown of each voice component, and tells you at a glance exactly what you can and can't modulate. These components are conceived as Pages, and are given stunning names like 'VCO1', 'FM/LAG' and 'LFO X'. Each Page has a Page Select button adjacent to it, which is used to call the associated parameters into the LED windows.

The diagrams are a great help, make no mistake, but having said that, I reckon Oberheim could have chosen better colours than the dull greys, greens and blues that currently grace the instrument's front panel – they aren't exactly an aid to visibility.

As they did with the Xpander, Oberheim have provided three 40-character, 14-segment fluorescent green LED displays on which (at last) a sensible amount of information can be displayed. Two of these windows are located on the centre panel in the Page Modifier section, one being used to display the selected parameters or functions, and the other to display their associated values. An array of buttons under each window is used to select a function or a parameter, and a set of infinite rotary knobs selects a new value.

Sad to say, things get more complex when you come to Multi Patch mode, because it's here that a second set of Pages comes into play. These Pages are assigned appropriate names like 'Volume', 'Pan' and 'Zone X', and can be summoned forth into the central display at the touch of a button.

But what's so nice about this way of doing things is that whole sections (consisting of up to six allied parameters) can be called into the central display at any one time. From there, they can be simultaneously altered by twiddling a set of six infinite rotary knobs. As PW pointed out last September, this is a much more helpful arrangement than the digital parameter access system now almost universally employed by the rest of the synth industry. The reason for that is simple. Whereas most modern synths don't allow you to discover how altering more than one parameter value simultaneously affects the sound, the Oberheims do. And that's going to save a lot of people a lot of programming time.

All editing can be accomplished as you're playing, with any changes being registered immediately (ie. in real time). New settings are remembered no matter which Page you subsequently go to, and even through power-down, until a new patch is selected prior to storing.

So, Oberheim have come up with an access system that strikes a neat balance between the economy of centralised displays and the immediacy of dedicated controllers. I found I was able to access and alter any parameter very quickly, and the new Modulation Page proved a tremendous help in dealing with that side of things.

Interconnections

Sad to say, it's in this department that the Matrix 12 is somewhat lacking by comparison with the Xpander. For the moment, at least.

But first the good news. Carried over from the Xpander are a memory protect switch (recessed, thankfully) and the merry trio of MIDI In, Out and Thru sockets, plus cassette in and out connectors, two pedal sockets (capable of handling footswitches and footpedals), an 'advance chain' socket, a trigger in socket (with switchable polarity) and stereo and mono outputs.

However, gone are the individual CV/Gate inputs and audio outs that graced the Xpander. Their omission wouldn't be so serious if the Matrix were a budget poly of limited studio applications. But it aspires to be a good deal more than that, and seeing as Oberheim managed to give the Xpander both CV/Gate connectors and individual audio outs, I can't for the life of me think why they've left them off the Matrix. The nice people at Turnkey assure me they're doing all they can to get the Californians to change their minds on this one, and I hope they succeed.

And so to MIDI. Historically, Oberheim were initially fairly sceptical about the virtues of the new interface (and perhaps they still are), but there's no denying they've subsequently implemented it with a welcome thoroughness. Specifically, the Matrix 12's MIDI implementation can be split into three areas: multi patches, global control and data transfer.

Each zone within a multi patch can be assigned its own MIDI channel, or be set to Omni mode. Choice of MIDI transmission and/or reception is also zone-specific. If MIDI In is selected, the zone responds to note *and* controller information, while if MIDI Out is selected, the zone transmits notes received from the keyboard and from MIDI In; controller information is only transmitted if you select the appropriate option. A final provision, very necessary if zones are overlapped and one of them is only meant to be playing incoming MIDI data, can be brought into play to shut off keyboard input for any given zone.

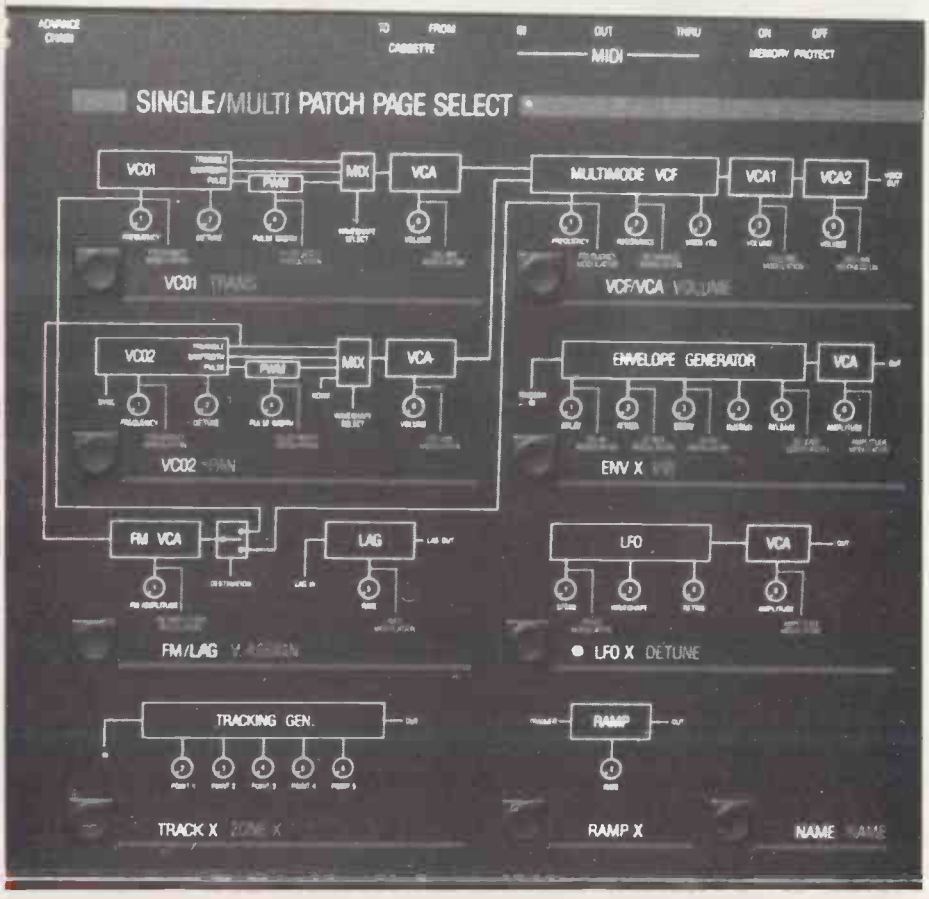
In case you hadn't already guessed, what all these options add up to is a tremendously versatile system for configuring a MIDI setup, though I guess the system will make even more people happy when the CV/Gate inputs eventually materialise.

As for the MIDI global control and data transfer options, these are accessed *via* the Master Page. Global control consists of Basic Channel selection, controller code allocation, scaled response to incoming velocity information, patch change transmission on/off, echo on/off (when this is on, Matrix data and MIDI In data are both sent to MIDI Out), Reset (turns off all notes and returns the instrument to a default MIDI condition) and Mute (turns off all notes).

Incidentally, controller code allocation can be seen as a software 'patchbay' used to connect MIDI controllers to the local controllers of the Matrix 12. Levers, pedals and pressure may all be assigned any MIDI controller number between zero and 121, or the dedicated Bender and after-touch pressure codes. This is the sort of flexibility you'd expect to find on a dedicated controller keyboard, though Yamaha's KX88 is the only example that springs to mind at the moment. Maybe Oberheim's own forthcoming XK controller will offer something similar. Whatever, combining the flexibility of the Matrix 12's internal modulation routings with its own comprehensive keyboard arrangement makes for a highly versatile MIDI system.

The third area of MIDI control concerns data exchange. 'SystemX' must be enabled before anything can happen on this front. You can send either a single or multi patch individually, or all internal patches in one go, which takes about 20 seconds. Any Xpander owners out there might like to know that Matrix 12 and Xpander data are fully compatible with each other, and may be transferred in either direction – but you'll need something in the way of modification. Downloading from Matrix 12 to Xpander, for instance, will require Xpander Software Revision 1.3, available from your nearest chemist.

Compatibility is also present on the tape storage front, which can't be bad.



Conclusions

Powerful enough to kick the rest of the band into the ionosphere in a live situation, yet sufficiently flexible to take pride of place in an above-average studio setup, the Matrix 12 is everything a top-notch analogue poly should be and a fair bit more besides. Because apart from the odd case of Retrofit Blues, Oberheim seem to have got everything right.

UK distributors Turnkey already have takers for the entire first batch of Matrix 12s, and the review model only gained a temporary reprieve so that E&MM's readership could learn of the instrument's many and varied synthetic delights.

By combining the best that analogue synthesis has to offer with one of the smartest examples of microprocessor-based control of a musical instrument I've yet seen, Oberheim have come up with a keyboard that deserves to set not just one standard, but a whole slew of them. If you can afford the Matrix 12, go for it. If you can't, you're in for a long wait before any secondhand bargains come along... ■

RRP of the Matrix 12 is £5200 plus VAT. Further details from: Turnkey, Brent View Road, London NW9 7EL. ☎ 01-202 4366.

Hanks Music

HI-TECH

Fender

FENDER Gold Elite Strat, inc case	£549
FENDER Standard Elite Strat, inc case	£449
FENDER Gold Elite Tele, inc case	£485
FENDER Master Series Esprit, Inc case	£399
FENDER '57 Vintage Precision Bass, inc case	£299
FENDER '62 Vintage Precision Bass, inc case	£299
FENDER Squier '57 Vintage Strat	£199
FENDER Squier '62 Vintage Strat	£199
FENDER Squier '52 Vintage Tele	£179
FENDER Squier '62 Vintage Jazz Bass	£199
FENDER Squier '57 Vintage Precision Bass	£149
FENDER Squier '62 Vintage Precision Bass	£149
FENDER Squier Bullet '82 black	£99
FENDER Squier Bullet '82 S/burst	£99
FENDER Tele Custom 1971	£245
FENDER Music Master Bass S/H	£95

YAMAHA

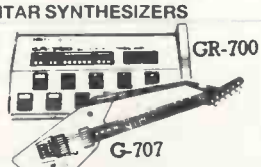
YAMAHA SG1300T, Ivory, Tremelo	£499
YAMAHA SG1000S, Jet Black	£325
YAMAHA SG1000, Tobacco, S/H	£245
YAMAHA SG500, Cherry Secondhand	£195
YAMAHA SG450T, White, Tremelo	£315
YAMAHA SG200, Sunburst	£199
YAMAHA SJ550, new model, Cherry	£289
YAMAHA SE200, new model, Black	£169
YAMAHA SE300, new model, Black	£199
YAMAHA SC600, 3 pick-up model, Brown	£199
YAMAHA SG35, Circa 1974, Brown	£85
YAMAHA BB3000 Metallic Black, inc. case	£559
YAMAHA BB1200 Cherry Sunburst	£249
YAMAHA BB1100-S Active	£335
YAMAHA BB1000 Brown Stain	£265
YAMAHA BB400S Fretless, Black	£225
YAMAHA BB400S Fretless, Cherry	£199
YAMAHA BB300, Jet Black	£169

Ibanez

IBANEZ RS1300, Locking Trem, Natural	£289
IBANEZ RS1100, All Black Model	£289
IBANEZ RS1010, 'Steve Lukather', Blue	£275
IBANEZ RS530, New Model, Locking Trem	£325
IBANEZ RS440, New Model, Black	£269
IBANEZ RS135, Tremelo, White or Yellow	£159
IBANEZ RS315, Tremelo, Blue	£199
IBANEZ Cimar, 3 pick-up, Trem, White or Blue	£135
IBANEZ AM205, Medium size body, Tobacco	£325
IBANEZ AM100, Full size body, Tobacco	£295
IBANEZ AM50, Small body, Tobacco	£275
IBANEZ AS80, Full size Artist Series, Natural	£295
IBANEZ AS80, Full size Artist Series, Cherry	£295
IBANEZ MC924 Active Bass, Ivory	£395
IBANEZ MC824 Passive, Walnut	£319
IBANEZ Road Star RB950, Black	£265
IBANEZ Road Star RB850, Black	£265
IBANEZ Road Star RB750, Black	£245
IBANEZ Road Star RB820, Silver	£219
IBANEZ Road Star RB650, Black	£175
IBANEZ Road Star RB630, Black	£155
IBANEZ Blazer BL800, Red	£165
CIMAR by IBANEZ, PB Standard, White	£119
CIMAR by IBANEZ, PB Standard, Blue	£119
CIMAR by IBANEZ, PB Standard, Red	£119
CIMAR by IBANEZ, PB Standard, Black	£119

Roland

GUITAR SYNTHESIZERS



ROLAND GR707 Synthesizer with Tremelo finished in Silver, plus GR700, 64 Memory Programmer. You'll be amazed by the sound & our Price!
ROLAND GR300 Synthesiser with guitar, red, s/h £399

Aria

ARIA SB600 Bass, Black	£245
ARIA SB11 Special Fretless, Sunburst	£249
ARIA RSB Special, Black	£299
ARIA RSB Standard, Tobacco Sunburst	£149
ARIA RSB Deluxe	£275
ARIA CSB, Black 'n' Gold	£249
ARIA SB BG1 Black 'n' Gold	£325
ARIA SB Elite-1 Opal Blue	£345
ARIA RS Wildcat, Black, inc case	£199
ARIA RS Wildcat, White inc case	£199
ARIA Cardinal, Black 'n' Gold	£229
ARIA U60-T, Urchin, Black, inc case	£145
ARIA Cardinal CS Deluxe, Black	£205
ARIA Pro Deluxe, Tobacco, S/H	£125
ARIA TA30, Jet Black, Semi acoustic	£185

Tokai

TOKAI TST 40, Hendrix Model, Red	Best Price
TOKAI TST 40, Hendrix Model, S/B	Best Price
TOKAI TST 50, '58 Vintage, Red	Best Price
TOKAI TST 50, '58 Vintage, S/B	Best Price
TOKAI TST 50, '58 Vintage, Blue	Best Price
TOKAI TST 50, '58 Vintage, Gold	Best Price
TOKAI TST 50, '64 Vintage, Black	Best Price
TOKAI TST 50, '64 Vintage, Gold	Best Price
TOKAI TST 50, '64 Vintage, S/B	Best Price
TOKAI TST 40, Humbucking Pick-ups, Red	Best Price
TOKAI TST 55, L/hand Models inc. Case	Best Price
TOKAI TST 70, Locking Trem models	Best Price
TOKAI TTE50, Townsend model, 54 Blonde	Best Price
TOKAI TTE60, Quilted Mahogany Top	Best Price
TOKAI TTE70, Edge Binding, Sunburst	Best Price
TOKAI TTE70, Edge Binding, Black, S/H	Best Price
TOKAI TTE55, Left Handed Models	Best Price
TOKAI Talbo, Metal body, Black	Best Price
TOKAI Talbo, Metal body, White	Best Price
TOKAI Vintage Explorer, Natural	Best Price
TOKAI Flying V, inc case	Best Price
TOKAI Les Paul 57 model, White	Best Price
TOKAI Les Paul 58 model, Black	Best Price
TOKAI SG Custom model, Cherry	Best Price
TOKAI 335, Semi Acoustic, Tobacco	Best Price
TOKAI TJB45, Vintage Jazz Bass, Black	Best Price
TOKAI TJB 45, Vintage Jazz, Red	Best Price
TOKAI TJB 45, Vintage Jazz, White	Best Price
TOKAI TJB 45, Vintage Jazz, Sunburst	Best Price
TOKAI TJB 45, Vintage Jazz, Powder Blue	Best Price
TOKAI TJB 45, Vintage Jazz, Natural	Best Price
TOKAI PB 60, Violin Finish, Edge Binding	Best Price
TOKAI 'Jaco Pastorus' bass	Best Price

Westone

WESTONE Super Headless Basses	£445
WESTONE Quantum, Headless, Black	£209
WESTONE 'The Rail', Headless, Black	£219
WESTONE Thunder III Jet, Black	£295
WESTONE Thunder II, Metallic Silver	£195
WESTONE Thunder I, Active, Black	£159
WESTONE Thunder I Active, Light Oak	£149
WESTONE Thunder I, Standard, Oak	£125
WESTONE Thunder, Jet, All Black	£135
WESTONE Concorde-1, Bass	£125
WESTONE Concorde 1, Guitar, Red	£85
WESTONE Spectrum II, Tremelo, Black	£165
WESTONE Thunder II, Light Oak	£124
WESTONE Thunder Jet, All Black	£125
WESTONE Thunder I, Active, Oak	£149
WESTONE Thunder I, Active, Black	£159
WESTONE Thunder I, Tremelo, Black	£144

Vantage

VANTAGE Quest, Atak 1 Guitar, Black	£139
VANTAGE Quest, Atak 2, Black	£149
VANTAGE Avenger, coil taps, Trem, Black	£179
VANTAGE Avenger, coil taps, Trem, Black	£169
VANTAGE Avenger, coil taps, Black	£155
VANTAGE X-77T, 3 pick-up, Trem, Black	£215
VANTAGE X-38T, 3 pick-up, Red	£215
VANTAGE X-35T, 3 pick-up, Black	£189
VANTAGE Profile Vintage Series, White	£149
VANTAGE Profile Bass, White	£129
VANTAGE Profile PB in Black M/N	£129
VANTAGE Quest Atak 1B, Black M/N	£149
VANTAGE Quest Atak 1B, White M/N	£149
VANTAGE Quest Atak 11-B, Black	£175
VANTAGE Quest Atak 11-B, White	£175

WASHBURN

WASHBURN A-20V, Stage Series, Trem	£245
WASHBURN A-5V, Stage Series, Trem	£149
WASHBURN A-5, Stage Series, White	£129
WASHBURN A-5, Stage Series, Red or Black	£129
WASHBURN Falcon, Last one left	£199
WASHBURN Force 3, Tremelo, White	£149
WASHBURN Force 4 Bass, Black	£145
WASHBURN Stage Bass, Black S/H	£110

Vigier

ViGiER Arpege Bass Active para EQ one only, flame red £499

VOX

VOX White Shadow with Tremelo	£125
VOX White Shadow, Fretless Bass	£149
VOX Standard Model bass, jet black	£99

CARLSBRO

CARLSBRO Hornet 45, Keyboard Combo	£168
CARLSBRO Hornet 45, Lead Combo	£149
CARLSBRO Hornet 45, Bass Combo	£130
CARLSBRO Cobra 90, Keyboard Combo	£249
CARLSBRO Cobra 90, Lead Combo	£199
CARLSBRO Cobra 90, Bass Combo	£199
CARLSBRO Sherwood 90, Solo Artist Combo	£259
CARLSBRO Stingray 150, Keyboard Combo	£385
CARLSBRO Stingray 150, Lead Combo	£325
CARLSBRO Stingray 150, Pro Lead Combo	£465
CARLSBRO Stingray 150, Bass Combo	£312
CARLSBRO Cobra 90, Keyboard Top	£159
CARLSBRO Cobra 90, Bass Top	£119
CARLSBRO Cobra 90, PA Top, Reverb	£169
CARLSBRO Stingray 150, Keyboard Top	£237
CARLSBRO Stingray 150, Lead Top	£217
CARLSBRO Stingray 150, Bass Top	£179
CARLSBRO Marlin 150, PA Top	£247
CARLSBRO Marlin 300, PA Top	£329
CARLSBRO X-90 Slave or PA Top	£129
CARLSBRO X-150 Slave or PA Top	£159
CARLSBRO S300 Stereo Slave	£289
CARLSBRO S600 Stereo Slave	£445

Marshall

MARSHALL 2203 100 watt M/V Top	Phone
MARSHALL 2210 100 watt Split Top	Phone
MARSHALL 1959 100 watt Super Lead Top	Phone
MARSHALL 1992 100 watt Bass Top	Phone
MARSHALL 2204 50 watt M/V	Phone
MARSHALL 1987 50 watt Super Lead Top	Phone
MARSHALL 2205 50 watt Split Top	Phone
MARSHALL 1986 50 watt Bass Top	Phone
MARSHALL 1984 400 watt 4x12 Bass Cab	Phone
MARSHALL 1935 280 watt 4x12 Lead Cab	Phone
MARSHALL 1982 400 watt 4x12 Lead Cab	Phone
MARSHALL 1960 280 watt 4x12 Lead Cab	Phone
MARSHALL 1936 140 watt 2x12 Lead Cab	Phone
MARSHALL 5005 12 watt Lead Combo	Phone
MARSHALL 5501 12 watt Bass Combo	Phone
MARSHALL 5301 12 watt Keyboard Combo	Phone
MARSHALL 5002 20 watt Lead Combo	Phone
MARSHALL 5502 20 watt Bass Combo	Phone
MARSHALL 5302 20 watt Keyboard Combo	Phone
MARSHALL 5010 30 watt Lead Combo	Phone
MARSHALL 5503 30 watt Bass Combo	Phone
MARSHALL 5210 50 watt Lead Combo	Phone
MARSHALL 5305 50 watt Keyboard Combo	Phone
MARSHALL 5306 60 watt Keyboard Combo	Phone
MARSHALL 5506 60 watt Bass Combo	Phone
MARSHALL 5520 150 watt Bass Combo	Phone
MARSHALL 4010 50 watt Valve Lead Combo	Phone
MARSHALL 4104 50 watt 2x12 Valve Combo	Phone
MARSHALL 4210 50 Split Channel Combo	Phone
MARSHALL 5275 75 1x12 Reverb Combo	Phone
MARSHALL 4103 100 2x12 Valve Lead Combo	Phone
MARSHALL 4211 100 2x12 Valve Split Combo	Phone
MARSHALL 3210 Compact Stack, in Stock	Phone
MARSHALL 3210, 100 Transistor, Split Channel	Phone

Roland

ROLAND JC120, 120 watt, Jazz Chorus Combo	£445
ROLAND JC-50, 50 watt Jazz Chorus Combo	£245
ROLAND JC-77 80 watt Jazz Chorus Combo	Phone
ROLAND Spirit, 50B Bass Combo	£189
ROLAND Spirit, 15B Bass Combo	£115
ROLAND Cube 20, Lead Combo, Reverb	£119
ROLAND Cube 40, Lead Combo, Reverb	£159
ROLAND Cube, 100, Lead Combo, Reverb	£225

Fender

FENDER Twin Reverb II Combo	£449
FENDER Showman 2x10 Combo	£399
FENDER Concert 4x10 Combo	£369
FENDER Montreaux 1x12 Combo	£299
FENDER DeLuxe Reverb 1x12 Combo	£235
FENDER Harvard Reverb 1x10 Combo	£129
FENDER Yale Combo 1x12 Combo	£175

SESSION

SESSIONETTE 75 1x12 Combo	£245
SESSIONETTE 75 2x10 Combo	£275
SESSIONETTE 100 1x15 Bass Combo	£339
SESSIONETTE 100 4x10 Bass Combo	£349

KUDOS

KUDOS-251, 100 watt PA Cabs/Monitors each	£75
KUDOS-251, 100 watt PA Cabs/Monitors pair	£139
KUDOS-351, 200 watt PA Speakers pair	£249
KUDOS-655, 320 watt PA Speakers pair	£425
KUDOS-666, 600 watt PA Speakers pair	£525
KUDOS MX-6400 PA Mixer Amp inc Digital Echo	£545

WEM

WEM Songbird 200 watt PA cabs	£199
WEM Songbird 300 watt PA cabs	£249
WEM Phantom 600 watt PA cabs	£399
Speaker Stands for above, pair	£75

Traynor

TRAYNOR 12/201, 12/2 Pro Mixer	£485
TRAYNOR 6400 40 watt Mixer amp	£297
TRAYNOR 4200, 70 watt Mixer amp	£159
TRAYNOR PS 600, 300 Stereo Slave	£399
TRAYNOR CS 115H, Cabs Pair	£369
TRAYNOR CS 1012H Cabs	£275
TRAYNOR CS 120H Cabs, Pair	£319
TRAYNOR CS 112-H Cabs, Pair	£175

New 'Electronic Drum Room' NOW OPEN

SIMMONS SDS-8 5-Drum Outfit	£699
PEARL DRX-1, 5-Drum Kit, 7 Pre Sets, one Programmable	
With stands	£895
With heavy duty stands	£950
TAMA Techstar 5-Drum Outfit, No Stands	£775
TAMA Techstar 5-Drum Outfit, Inc. Stands	£875
ULTIMATE PERCUSSION UP-5, 5-Drum Outfits	£499
MULTI-KLONE 5-Drum Outfits, Black, Red or White	£399
KLONE-KIT II, 5-Drum Outfit, Red or White	£285
KLONE DUAL PERCUSSION SYNTH, Twin Pads	£199
PEARL Syncussion Synth, Twin Pads, Secondhand	£149
DIGISOUND Bass & Snare Module	£245
DIGISOUND Bass & Snare Module + Power Supply	£149
DIGISOUND Twin Tom Set-up, inc. Pads & Stand	£299

ATTENTION – ALL DRUMMERS

See our Full Page Advert in the New Rhythm Drum Magazine – OUT NOW! Similar Magazine to FAMM

300-302 London Road, Hadleigh, Essex, SS7 2DD. Tel: Southend (0702) 55

NOLOGY

low prices!

TASCAM

TASCAM 38, 8 Track Reel-to-Reel £1,850
TASCAM 22-4, 4-Track Reel-to-Reel Recorder £799
TASCAM 244, Portastudio, 4-Track Cas £699
TASCAM 225 Syncset, Multi-Track Cassette £199
TASCAM Porta-One, 4-Track Cassette £425
TASCAM 234, Syncset, 4-Track, Cassette £525
TASCAM MX-80 Syncset Stereo Mixer £239
TASCAM PE-40 Syncset Stereo Pre-Amp £249
TASCAM Flight Case for Syncset System £99
TASCAM Complete Syncset Package, as above £950

Clarion

CLARION XD-5, 4 Track Cassette Deck £485
CLARION XA-5, Mastering Unit with Echo £775
CLARION Trolley Console for above units £125
CLARION Remote Controller £29
CLARION System as above inc. Speakers £1299

Cutec

CUTEC MR808, 8-Track Video Cassete Multitrack Phone
CUTEC MR402, MkII, 4-track cassette £415
CUTEC MX1200, 12 into 2 stereo mixer £325
CUTEC GS2200, Stereo Graphic, Spectrum Analyser £199
CUTEC AE400, Reverb with Analog pre-delay £129
CUTEC CD425 Digital Delay with Sub Delay £325
CUTEC GE-2010 10-band Stereo Graphic £98
CUTEC TFE-1531 15-band Stereo/31 band mono £249
CUTEC SL-200 Stereo Compressor/Limiter £279

Aria

ARIA R-504 4-Track Cassette £399
ARIA SQ-520 Stereo Graphic/Spectrum Analyser £189
ARIA SQ-522 Stereo Graphic £149
ARIA AR-525 Stereo Reverb £185
ARIA DEX1000, Digital Delay, LED Time Readout £265

YAMAHA

YAMAHA NEW MODEL MT44-D, 4-Track Cassette £399
YAMAHA NEW MODEL RM602, 6 Channel, Mixer £249
YAMAHA NEW MODEL, RB-35B, Rack & Patchbay £149
YAMAHA NEW MODEL, MT System as above £750
YAMAHA MS10, 20 watt Amp/Speaker Monitors £99
YAMAHA GC2020 Stereo Compressor/Limiter £229
YAMAHA R1000, Digital Reverb, Rack Mounted £499
YAMAHA D-1500, Digital Delay, 16 Memories, Midi £569

FOSTEX X15

The portable multitrack

FOSTEX X-15, 4-Track, inc. Power Supply £299
FOSTEX 250 Multitracker, 4-Track Cassette £625

Ibanez

IBANEZ HD-1000, Digital Harmonizer & Echo £345
IBANEZ DM-2000 Digital Echo, LED Readout £299
IBANEZ DM-1100 3.6 second Digital Delay £285

Vesta FIRE

VESTA FIRE MR1, Rack Mounted 4-track cassette £499
VESTA FIRE VF -420 Digital Delay with sampling Phone
VESTA FIRE RV-3 New Model stereo reverb £199
VESTA FIRE RV2 Stereo Reverb £229
VESTA FIRE SF-010 Dual Flanger/Chorus £225
VESTA FIRE SL020 Dual Compressor Limiter £259
VESTA FIRE TC-810 Two Channel Aural Exciter £185
ARION Micon Guitar Tuner £25

EVANS

EVANS ECHOS

EVANS MDD-1500 Digital Delay with Sub Delay £265
EVANS MDD-1000 Digital Delay, LED Readout £245
EVANS EP-250 Analog with Reverb £199
EVANS AE-250R, Analog with Reverb £175
EVANS AE-250, Analog Delay £159
EVANS EP-100, Analog Delay £110
EVANS EP-50, Analog Delay £79
EVANS MX-101, Analog Delay £75

RACK-MOUNTED ECHOS

KORG SDD-3000 Programmable Digital Delay £699
KORG SDD-1000, 2 second Sound Sampling, Digital £325
KORG EM-50, Mixer Amp with Echo £199
ROLAND SDE-3000, Digital Delay, 8 Memories £799
ROLAND SDE-1000, Digital Delay, 4 Memories £399
ROLAND BOSS DE200, Digital Delay £279
WASHBURN WD-1400 Digital Delay, Modulation £235
CUTEC CD425 Digital Delay with Sub Delay £325
ARIA DEX1000, Digital Delay, LED Time Readout £265
IBANEZ HD-1000, Digital Harmonizer & Echo £345
IBANEZ DM-2000 Digital Echo, LED Readout £299
IBANEZ DM-1003.6 second Digital Delay £285
YAMAHA R1000, Digital Reverb, Rack Mounted £399
YAMAHA D-1500, Digital Delay, 16 Memories, MIDI £439

STEREO MIXERS

TRAYNOR 12/201, 12 Channel Graphic £485
PRO-MARK MX-3, 8/4/2 Ideal for 8-Track use £445
STARSOUND Dynamix, 16 into 2, Studio £359
STARSOUND Dynamix, 12 into 2, Studio £259
STARSOUND Dynamix, 6 into 2, Studio £175
MTR 12/8/2, Studio Mixer £395
MTR 6/4/2, Studio Mixer £225
CUTEC 12/1200X, 12 Channel, Graphic £335
CUTEC Mixer Case for above £32
DAVOLI 8 channel, built-in echo £195
KORG KM-X8, 8 into 2 ..... £175
BOSS BX-800, 8 Channel, inc. Set Headphones £246
BOSS BX-600, 6 Channel, inc. Set Headphones £135
ACES, New Model 10/8/2 ..... £399

MONITOR SPEAKERS

YAMAHA S-250 Monitors, 500 watts, pair £589
YAMAHA S-100 Monitors, 200 wats, pair £220
YAMAHA S-75 Monitors, 150 watts, pair £150
BOSE-101 100 watt Monitors, pair £110
BOSS MS-100 100 watt Monitors, each £75
KORG MS-25 Powered Monitors, each £125

BOSS EFFECTS

BOSS BF-2 Flanger, inc. AC Adaptor £86
BOSS CE-2 Chorus, inc. AC Adaptor £80
BOSS CE-3 Stereo Chorus, inc. AC Adaptor £81
BOSS CS-2 Compressor, Inc. AC Adaptor £67
BOSS DD-2 Digital Delay, inc. AC Adaptor £159
BOSS DF-2 Distortion Feedback, inc. AC Adaptor £61
BOSS DM-3 Stereo Delay, inc. AC Adaptor £99
BOSS DS-1 Distortion, inc. AC Adaptor £56
BOSS GE-7 7 Band Graphic, inc. AC Adaptor £81
BOSS HM-2 Heavy Metal, inc. AC Adaptor £49
BOSS NF-1 Noisegate, inc. AC Adaptor £46
BOSS OC-2 Octaver, inc. AC Adaptor £58
BOSS OD-1 Overdrive, inc. AC Adaptor £58
BOSS DH-2 Super Phaser, inc. AC Adaptor £86
BOSS PH-1R Phaser, inc AC Adaptor £81
BOSS SD-1 Super Overdrive, inc. AC Adaptor £56
BOSS TW1- Touch Wah, inc. AC Adaptor £86
BOSS VB-2 Vibrato, inc. AC Adaptor £71
BOSS TV-12 Chromatic Tuner, Inc. AC Adaptor £46
BOSS BX800 8 Channel Mixer, inc. Headphones £246
BOSS BX600 6 Channel Mixer inc. Headphones £135
BOSS BX400 4 Channel Mixer, Inc. Headphones £89
BOSS DR-110 Dr Rhythm, inc. AC Adaptor £123

KORG Modular Pedal System

KORG PME-40X Pedal Board, Holds 4 Units £99
KORG KOD Overdrive Module £38
KORG KD1 Distortion Module £38
KORG KCO Compressor Module £38
KORG KFL Flanger Module £69
KORG KGE Graphic Equalizer Module £53
KORG KAD Analog Delay Module £99
KORG KES External Send/Return Module £22
KORG KPH Phaser Module £59
FREE Pedal Board with any 4 modules!

YAMAHA

YAMAHA DX5 New Model, June Delivery ..... Best Deal
YAMAHA DX7 Not due for replacement 1987 Best Deal!
YAMAHA KX-88 Comprehensive M/Keyboard Best Deal!
YAMAHA QX-1 Sequencer ..... Best Deal!
YAMAHA TX216 Expander ..... Best Deal!
YAMAHA TX816 Expander ..... Best Deal!
YAMAHA TX-7 Midi DX7 FM Expander ..... Best Deal!
YAMAHA QX7 Digital Multi-track Sequencer ... Best Deal!
YAMAHA KX-5 Remote Midi Keyboard ..... Best Deal!
YAMAHA TX-216 Rack Mounted FM Expdr. ..... Best Deal!
YAMAHA TX-1 Single Expander Modules ..... Best Deal!
YAMAHA PF15 & PF10 FM Digital Pianos ..... Best Deal!
YAMAHA CP35 Stage Piano ..... Best Deal!
YAMAHA RX11 & RX15 Digital Drums ..... Best Deal!
YAMAHA R1000 Digital Reverb Unit ..... Best Deal!
YAMAHA D1500 16 Memory Midi Delay Unit ... Best Deal!
YAMAHA New MT Home Recording System ... Best Deal!

CX5-ME MUSIC COMPUTER
YAMAHA CX5-ME Computer with YK01 Keyboard and YRM-101 Music Composer Programme
TOP SECRET PACKAGE DEALS NOW AVAILABLE!
YAMAHA YK-10 Full size Keyboard ..... IN STOCK
YAMAHA YRM 102, 103, 104 and accessories IN STOCK
YAMAHA Real Time, Sequencer ROM ARRIVING SOON
YAMAHA RX Programmer ROM ..... ARRIVING SOON
YAMAHA Sound Sampling Package ..... SOON

Roland

WE DESIGN THE FUTURE

ROLAND JX-8P Synthesizer ..... Best Deal!
ROLAND PG-800 Programmer ..... Best Deal!
ROLAND JX-3P Synthesizers ..... Best Deal!
ROLAND PG-200 Programmer ..... Best Deal!
ROLAND Juno 106, Synthesizers ..... Best Deal!
ROLAND MKB 300 Mother Keyboard ..... Best Deal!
ROLAND MSK-10 Piano Expander ..... Best Deal!
ROLAND MSK-30 Poly Synth ..... Best Deal!
ROLAND AXIS Remote Midi Keyboard ..... Best Deal!
ROLAND MSQ 700 Digital Recorder ..... Best Deal!
ROLAND MSQ 100 Digital Recorder ..... Best Deal!
ROLAND TR707 Digital Drums ..... Best Deal!
ROLAND GR700 & 707 Guitar Synth ..... Best Deal!
ROLAND SDE1000 Digital Echo's ..... Best Deal!
ROLAND SH-101 Synth, MC202, M/comp ..... Best Deal!
ROLAND TR606, TR303 & DR110, R/Units ..... Best Deal!
ROLAND JC Amplification ..... Best Deal!
ROLAND Cube & Spirit Amplification ..... Best Deal!

KORG®

KORG DW 6000, Fabulous New Model ..... Best Deal!
KORG MPK-130, New Midi Bass Pedals ..... Best Deal!
KORG Poly 61, Midi Synthesizer ..... Best Deal!
KORG Poly 6, Synthesizer ..... Best Deal!
KORG Poly 800 Synthsizer ..... Best Deal!
KORG EX800, Midi Expander Modules ..... Best Deal!
KORG RX-100, Remote Midi Keyboard ..... Best Deal!
KORG EPS-1, Stage Piano with Strings ..... Best Deal!
KORG 80-S, Symphonic Piano with Strings .... Best Deal!
KORG 80 Symphonic Piano ..... Best Deal!
KORG SAS-20 Keyboard with Jazz Cartridge Best Deal!
KORG SDD-1000, Digital Delay with Sampling Best Deal!
KORG DDM-110, Digital Drum Rhythm Units Best Deal!
KORG DDM-220, Digital Latin Rhythm Units... Best Deal!
KORG PSS-50, Digital Super, Section ..... Best Deal!
KORG KMS-30, Midi Syncronizer Box ..... Best Deal!

SIEL

SIEL DK-80, amazing new synth £699
SIEL Expander-80 module, sequencer £399
SIEL CMK-49 keyboard £125
SIEL MIDI interface unit £79

commodore

SIEL Software for Commodore, Disk or Cassette available ..... POA

CASIO

CASIO CZ101, 32 Memory Poly Synth Midi BEST DEAL!
CASIO CZ1000, Full Size Keyboard Version BEST DEAL!
CASIO CT6000 Full Size Keyboard Midi ..... BEST DEAL!
CASIO CT410V, New Model Stereo ..... BEST DEAL!
CASIO CT310-S, Full Size Keyboard ..... BEST DEAL!
CASIO CT610 Stereo Model, Full Size K/b ... BEST DEAL!
CASIO CK500, Keyboard & Cassette Deck BEST DEAL!
CASIO CK100, Programmable, plus AM/FM BEST DEAL!
CASIO KX-101, Keyboard, Cas & Radio ..... BEST DEAL!
CASIO MT-100, 768 Variable Acc/ments ..... BEST DEAL!
CASIO MT-800, With Stereo Speakers ..... BEST DEAL!
CASIO MT-400V, With Stereo Speakers ..... BEST DEAL!

bit one

CHASE BIT ONE £799

Polyphonic ● 6 Voice ● Touch Sensitive ● Digital and Analogue.....£799

This fabulous keyboard is now available in Essex from Honky Tonk Music. Come & hear why it won the 1985 Professional Keyboard of the Year Award.

RHYTHM UNITS

SEQUENTIAL, New Model – Tom ..... Phone
SEQUENTIAL 'Drum Traks' Digital £875
ROLAND TR909, Analog/Digital £495
ROLAND TR707, All Digital, Fabulous £499
ROLAND TR808, Analog £395
ROLAND TR606, 'Drumatix' £185
ROLAND TB303, Bassline/Sequencer £185
ROLAND DR-110, Doctor Rhythm £110
YAMAHA RX11, Digital, 29 voices ..... Best Deal!
YAMAHA RX15, Digital, 15 Voices ..... Best Deal!
KORG/PSS-50 Digital, Super Section ..... Best Deal
KORG DDM-110, Digital Drums ..... Best Deal
KORG DDM-220, Digital Latin Percussion ..... Best Deal
HAMMOND DPM-48 Digital, Inc. 2 Extra ROMS £499
SOUNDMASTER SR-99 Programmable, 1 left £79
ROLAND CR-8000, Secondhand £245
ROLAND CR-5000, Secondhand £199

ORDER FORM

ALL PRICES INCLUDE VAT AND FREE DELIVERY
(UK Mainland)

NAME _____

ADDRESS _____

_____

_____

PHONE NO. _____

ITEM(S) REQUIRED _____ £ _____

_____ £ _____

SAME DAY DESPATCH
Southend (0702) 553647

ACCESS/VISA No.

Cheque enclosed ☐ HP Form Required ☐ Tick

3647

everything for the modern musician

Anvil Percussion Synthesiser

Just think of it, a sound-sampling drum machine that also lets you synthesise percussion sounds and stores voice and pattern data on floppy disk. We preview Britain's best MIDI bet yet – and talk to the men behind it. *David Ellis*

You probably don't need me to tell you that it takes a good deal of nerve to enter into the commercial arena of hi-tech musical instruments, especially if you're an unknown name and attempting R&D on a shoestring budget. Yet that's exactly what a new British company, Anvil Synthesisers, have tried to achieve with their advanced digital drum machine, the Anvil.

The Anvil story actually starts as far back as three years ago, but surprisingly for a project as complex as this, only a couple of people have been directly involved in the development. The men in question are musician and producer Rod Bowkett, who acted as the main creative drive, and engineer Roy Gwinn, who supplied the necessary hardware and software expertise.

If it's possible to sum up what the Anvil's designers have set out to achieve, it's to produce something in one box that'll do all the things people are using half-a-dozen different boxes for. By that, I mean everything you'd expect from drum synthesis, sampling drum machines, electronic drum modules, and so on.

Thus, the Anvil as it will be appearing in the near future is not only a sampling drum machine in the traditional sense, but also a percussion synthesiser that can be played from pads *via* MIDI. Furthermore, all its sounds can be stored on disk to be loaded up into RAM as and when you want to play, mix, or modify them.

Inside and Out

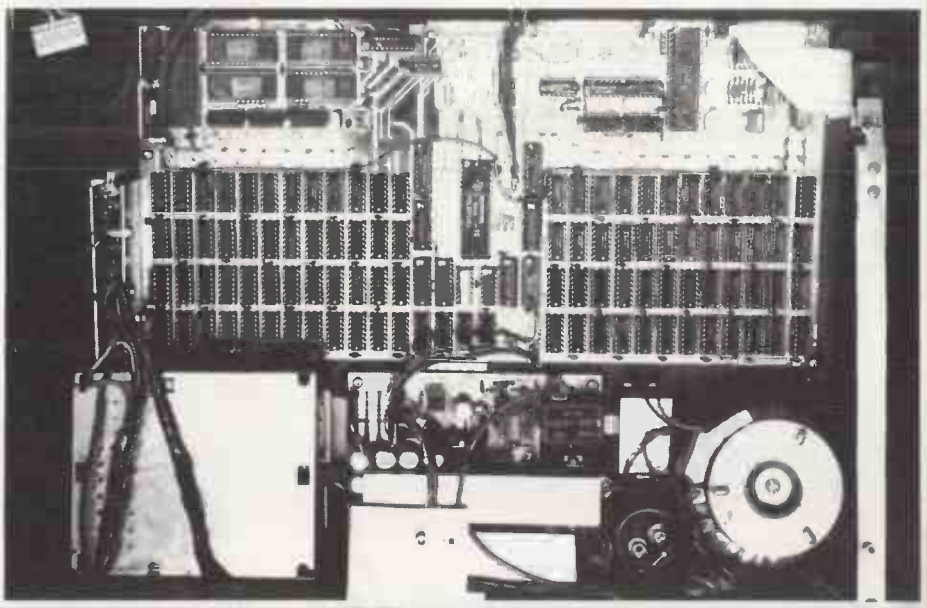
To begin with, the Anvil *looks* like no other programmable drum machine currently available. So it comes as little surprise to learn that its external layout (which has now earned the attentions of *Design* magazine, among others) came about as a result of collaboration with London's Royal College of Art.

It seems the College has a scheme whereby students work on projects that actually see the light of day, rather than remain within the academic seclusion of College galleries. A friend of a friend made the necessary introductions, and

Hey Presto, the Anvil emerged as one of the RCA's 1984 projects.

The College team's intention, according to Bowkett, was to make the machine look thinner than it really was, and as black as possible. Well, looks like they succeeded on both counts...

Let's take a look inside that attention-getting exterior. The top PCB holds a Z80 processor and its attendant chips, and serves the sequencer and the control panel functions. There's an eight-bit parallel communication bus to the 8086-based bottom board with MIDI connections at the rear, plus a tape interface planned originally for saving of sequences and sounds, but cancelled very early on in the project. In fact, the tape interface is currently being used for SMPTE code purposes, but the design



team are seriously considering replacing this with a custom SMPTE chip that'll cope better with varispeed.

Few modern musicians or engineers will let you forget the importance of informative displays on today's hi-tech instruments. After all, the more complex a machine gets internally, the more information the average user needs to exploit that complexity to the full. The Anvil's display is a 40-character indicator panel, with a 128-character set that incorporates special symbols for such things as notes. As it happens, the bar graph used in the machine's Sample mode is also built up from said special characters.

Users accustomed to working in ill-lit studios and concert venues (hands up the engineer who isn't) can take heart from the fact that the Anvil's main display unit is a specially-chosen fluorescent job, and the same reasoning lies behind the use of a number of electroluminescent areas – the sort of thing you'd normally find on car dashboards – for lighting up control functions above and below the panel's slider controls. Only problem for the designers was getting hold of an inverter that could power the displays, but that's another story.

The next thing to mention is the control strategy used for the Anvil's membrane pushbuttons. Interestingly, these buttons only illuminate if pressing them would cause something to happen, a condition that varies depending on what operational mode you're in at the time. By way of explanation, pushing the panel's Shift switch shows you precisely which buttons will light up in any given mode.

Anyway, now seems as good a time as any to list the various modes that exist within the Anvil's control system. In no particular order, these are Synth, Sample, Process, Add, Real-Time Parameter (RTP), Sequencer, Delete, and Menu.

As we mentioned in last month's *Rumblings*, the Anvil has 16 channels all told, though it seems likely these'll be most commonly used as eight stereo pairs. Their arrangement is pretty versatile; the only thing you *can't* do is play out the A and B sides of each channel pair at different pitches at the same time. That's because although there are 16 channels of DMA on the 8086 board for sending sound channels to the DACs, there are only eight counter-timers to actually generate the pitches. So, if you set the machine up to play, say, Channels 1A and 1B at different pitches, it'll do so quite happily providing they're not both happening at the same time. If a pitch conflict does exist, the channel that started earlier is terminated, and the pitch is changed.

> 'The Anvil's drum synth waveforms are built from tables of sinewaves, so you can perform additive synthesis before the sound gets to the filter.'

That limitation might seem serious at first, but given that 16 simultaneous voices are a pretty unlikely event in any 'conventional' drum sequence, it shouldn't prove too crucial a failing in practice.

Synthesis

Entering Synth mode presents you with a layout very much like that of a normal analogue synth, with an oscillator, filter, envelope generators, and so on (see accompanying block diagram). First, there are controls for setting the pitch in quarter-tones over a 10.6-octave range, with a fine-tune control thrown in for good measure. The 'oscillator' is a bit unusual, in that it doesn't just have the usual four waveshapes and noise source that are then processed by subtractive synthesis in the vast majority of today's (and indeed yesterday's) analogue synthesisers. Instead, the Anvil's waveforms are built from tables of sinewaves, which means you're able to perform additive synthesis before the sound even gets to the filter. Hence the odd parameters that are attached to the oscillator, like 'harmonic amplitude', 'harmonic symmetry', and 'odd/even crossfade'. What's more, all these parameters can be changed dynamically by routing the appropriate ADLR to them.

Next in the synthesis line is the filter, which is basically a four-pole type with variable resonance, centre frequency, filter mode, and so on. It also has a filter offset: make this value anything other than zero, and it introduces two more filters at a specific displacement above the centre frequency. And since all this is done in software, it doesn't cost anything other than processing time to add more filters, which has got to be good news for all those recession-bitten recording studios out there.

As I've already implied, the envelope generators (there are five of them) are all of the ADLR variety, the 'L' standing for Lag time. Additionally, you can route any of the EGs to just about any conceivable destination within the synth section, and there's a variable delay time right at the beginning of the cycle. Finally, pushing the Play button tells the processor to synthesise the finished sound into memory, and a countdown character at the end of the display tells you how far it's got.

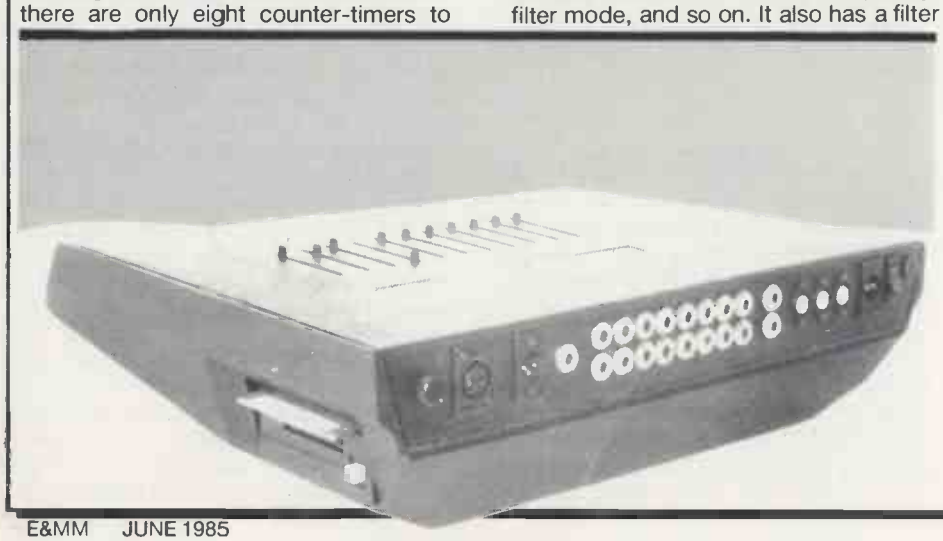
But with so much in the Anvil's sound synthesis department taking place in software, the time it takes for all the sound-modifying processes to actually happen is of crucial importance. At the moment, the designers estimate that the ratio between processing time and the actual length of the sound is about 10:1, which I reckon could be a little prohibitive.

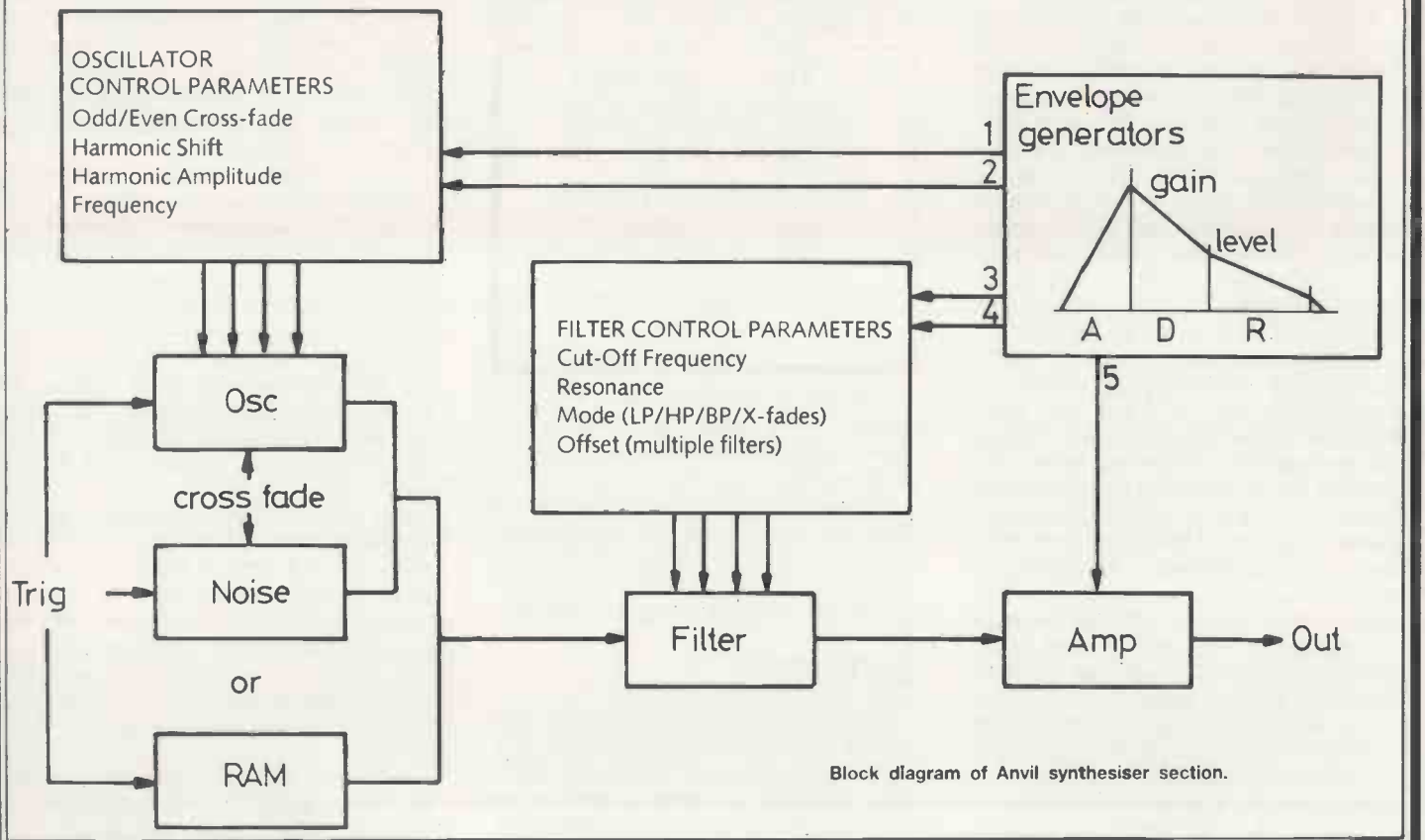
In fact, the synth software also extends into Process mode, as this allows you to process any sound in memory with the same sort of filter and ADLR set-up, once you've defined your start and end points for a sample. Don't panic, you haven't missed anything – I'll be going into the sampling side of things a little later on.

Next we come to Add mode, which allows you to add various memory locations together into one; RTP mode, which is the way in which the single parameter that's recorded in a sequence – touch, pitch, pressure, or whatever – is used to modify the sound in a given channel; and Menu mode, which is basically everything else, including the disk functions for loading and saving sounds and sequences. I'm assured that when the disk software is completed, you should be able to load up all 13 seconds' worth of sounds on each 800K, 3.5" disk in about 40 seconds. Which, if my arithmetic serves me correctly, works out as something like a couple of seconds for a decent-length drum sound.

System Philosophy

Now, the facility the Anvil has for simulating an analogue synth purely by number-crunching into memory is certainly a first for any sort of sampling system – percussion or otherwise. But the reasons for doing that aren't simply to *simulate* an analogue synth. Gwinn and Bowkett are being a good bit more ambitious than that, as the latter explained to me: 'the synthesis potential is actually far more flexible than that of any analogue synth I know of. For instance, rather than just having fixed filter modes like bandpass, lowpass, and highpass, the Anvil makes it possible to program a cross-fade between any of them, thereby ▷





Block diagram of Anvil synthesiser section.

giving a vast range of potential filter characteristics. And I certainly can't conceive of an analogue synth that's capable of *layering together* an infinite number of the results that sort of synthesis can provide.'

That's where the Add mode comes in. With it, you can synthesise eight different sounds, mix them together, and then use that sum as the basis for adding more on top. The sliders on the front panel allow you to set the levels of each of the eight channels in the mix, and pressing Play records the mix into memory. Then you can go back and delete the individual sounds that were previously in memory and load up some new ones in their place.

The great thing about this is that if you want to add a touch more click to a bass drum, for example, all you have to do is synthesise the click in Synth mode, add this to the pre-existing bass drum sample in Add mode, and then save this on disk as the new, clickier bass drum. And, of course, the Add mode's analogue mixer means you can make such changes in real time.

The Anvil team are envisaging the starting up of disk libraries consisting of bits of sounds that can then be dropped on top of other sounds, as well as complete sets of sounds. But getting on to some rather more involved production of sounds brings us back to the speed with which you can hear changes in sound taking place in Synth mode. I asked Roy Gwinn if he foresaw any difficulties in that direction.

'Hopefully not! If you try playing a sound before it's finished processing, it'll play as far as it's got at that particular time, which helps a lot to lessen the problem of the 10:1 processing time. The processing takes place at a rate of 24 microseconds per sample, and you can't issue very many instructions in that amount of time, even with an 8086 running at 8MHz. It'd be nice to make the synthesis real time, but you'd need a whole lot more hardware. Still, we are thinking of adding an 8087 arithmetic co-processor (*A cool £100 per chip – **Ed***) to the bottom board to help things along a bit.'

> 'The designers have set out to produce everything you'd expect from drum synthesis, sampling drum machines and electronic drum modules in one box.'

Sampling + Sequencing

Away from the intricacies of percussion synthesis and on to the oh-so-fashionable pastime of drum sampling. You can sample a sound into the Anvil's memory using either a microphone or line input, and there's a Level control at the back of the unit, this being allied to a bar graph display to give a visual indication of levels. Technically, sampling is 12-bit linear into 800K of RAM, with a sampling rate of 41kHz. The six-pole input filter has a centre frequency of 18kHz, and on the output, there are sixteen separate five-pole filters with a -3dB cutoff at 16kHz.

If you're not particularly *au fait* with the jargon that currently engulfs the sampling process, I'll just say those figures make *very* impressive reading – and listening. In fact, the sample rate and filter parameters may yet be better still, if time and cheap parts suppliers permit.

As for the sequencer that links the Anvil's synth and sampling sections together to form programmable rhythm patterns, this is actually rather similar in spec to that fitted to the original Linn, though it has a tree structure comprising Links, Chains, and Songs. Sadly, the machine lacks any form of step-time facility at present, but there is a variable correction factor which quantises notes as they're keyed in in real time. The RTP value is entered either from the RTP slider as you're pressing the buttons to get the triggers in, or, if you're playing in a sequence from the MIDI, direct from the key value being played.

Moving on to the aforementioned tree structure, the length of a Link can be defined by pressing a couple of keys whilst listening to the metronome, or you can set up a time signature in the time-honoured fashion. You can build up to 99 individual Links, chain those together into up to 99 Chains, and then define a Song out of those. Only one Song exists in memory at any one time, not because it uses up a lot of memory, but simply because you're encouraged to use the disk for saving and loading sequences!

A built-in external triggering facility allows you to enter data in real time (from an electronic drum pad, for example) straight into the sequencer and then either process it or use it as it is. That way,

you can combine quantised entry from the keypad on the Anvil's front panel with real-time entry from pads, all within the same Link if that's what you want.

This section is far from being everyman's answer to drum sequencing, however. There's no equivalent to the Linn's repeat trigger facility, and there isn't even any kind of flam option, even though machines a tenth of the Anvil's cost offer just such a provision. Actually, Bowkett and Gwinn would like to see both features built into their baby before too long, even though it seems unlikely that initial production Anvils will be so-equipped.

But my main source of disappointment with the Anvil's sequencer is that quantisation can only be applied while you're recording – not during playback. Bowkett defends the omission stoutly. 'The thing you often need to do on a drum machine is to have different quantisation levels within one measure, but simply being able to apply quantisation during playback wouldn't allow you to do that, so I can't really see the point. I certainly agree that keyboard sequencers need to have quantisation that's applied after recording, but for drum sequencers, I think the Linn approach works fine. I guess if enough people ask for it, we'll fit some sort of step-time facility, but let's see what happens first. Certainly it'd be a bit messy doing that on the Anvil's display, though it is a better display than on most drum machines – look at the Linn 9000, for instance. There are ways it could be done, but there's certainly no way 16 simultaneous events could be displayed.'

But given the Anvil's breadth of features, isn't it likely to be used as much more than just a standard drum machine? Perhaps users will find themselves needing a sequencer that's more a combination of both keyboard and drum sequencers.

'Yes, that's certainly possible. But one way of achieving that is to program in step-time using a MIDI sequencing package on a home micro. I think that's better than trying to force the Anvil's 40-character display into doing more than it's designed for.'

Conclusions

It's a strange paradox that the further up the technological ladder you climb, the less chance you have of pleasing all the people most of the time. It's a hard life, trying to get the cost-vs-facilities balance exactly right for as big a range of potential users as possible, yet I reckon Bowkett and Gwinn have done a better job than most, certainly in the upmarket drum machine stakes.

The lack of a step-time programming facility is the only serious omission I can find, and that's far outweighed by the sheer degree of imagination the Anvil team have shown in implementing the facilities their machine does incorporate.

The scope of the percussion synthesis section is extraordinary, the arrangement of channels is both neat and well thought-out, and the sampling is as good as any you'll find in this market area.

The only problem is that, as so often happens in circumstances like these, the people behind Anvil have grossly underestimated the time – and the money – it would take to get their project off the ground. As a result, the first version of the Anvil will probably be minus the synthesiser side, which still needs a fair bit in the way of software-writing. However, it will have the disk drive, sampling, sequencer, and MIDI as standard, and the company are thinking in terms of August's British Music Fair for the first public demonstration of this version. Software updates will take care of the synthesiser and SMPTE departments as and when work is completed.

As far as the price is concerned, Anvil are intending to sell the unit for around £5000. That might sound a lot for a drum machine no matter *how* extensive its facilities, but bear in mind that, with a few hardware modifications and some rather more extensive software rewriting, the Anvil could form the basis of a MIDI-compatible, polyphonic sound-sampling keyboard and digital recorder. And that isn't just wishful thinking on the designers' part... ■

For more information on the Anvil Percussion Synthesiser, contact Anvil Synthesisers Ltd on ☎ 01-341 5222.

Take a Stand...

It's estimated that the average keyboard player is willing to spend 10% of the cost of a synth setup on a stand to hold it all in place, yet nobody has attempted to survey what's available and how much it costs – until now.

Trish McGrath

I started off with a blank sheet of paper. There's been an almost total media silence about keyboard stands, so initially, my only source of information was the bundle of promotional literature I'd accumulated and the comments of friends.

Just what *are* the criteria you apply when choosing a keyboard stand, anyway? Is it just a matter of how many tiers it has? Evidently not. The interrogation of fellow staff members resulted in various other requirements coming to light (as well as some amazing disclosures that have absolutely nothing to do with keyboard stands...). Top of the list was, not unnaturally a suitable number of tiers; after all, there's not much use in buying a simple X-type stand if you're trying to accommodate three or four synths, or have plans to add to your line-up in the near future.

But there are a whole host of other considerations, too, like stability (will it topple over as you reach the high-point of your amazing solo?), reliability (will you need to wear reinforced boots to protect your toes from fast-descending keyboards?), durability of finish (will you have to repaint it after every gig?), weight (will you get a hernia just carrying it from gig to gig?), and sturdiness (is it made of a strong enough material not to buckle under a not inconsiderable weight?).

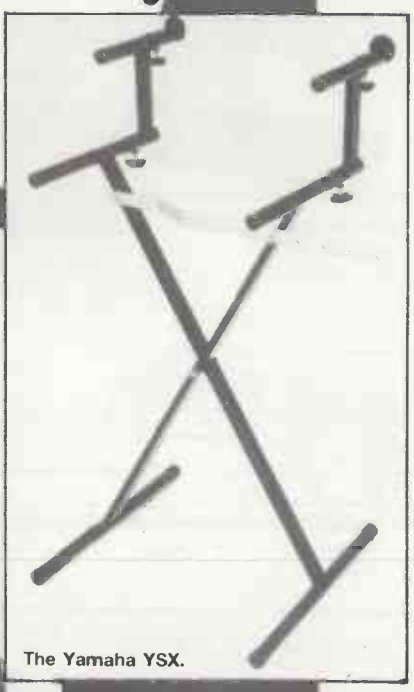
Then there's money. Not just simple value for money considerations, but, in this case, simply justification. Is it really *worth* lashing out £300 on something to hold three VL-Tones?

Finally, ease of setting-up does come into it, though just how much will depend on whether the stand is going to be stationary at a home or studio, or whether it'll be used regularly in gigging situations. In the latter case, bear in mind whether you'll need to assemble the thing singlehandedly or whether you've a couple of keyboard roadies with nothing to do other than set up stands for two hours before the soundcheck. Remember, also, that some stands incorporate a 'memory' feature that helps reduce setting-up time by letting you know where the various parts were positioned previously.

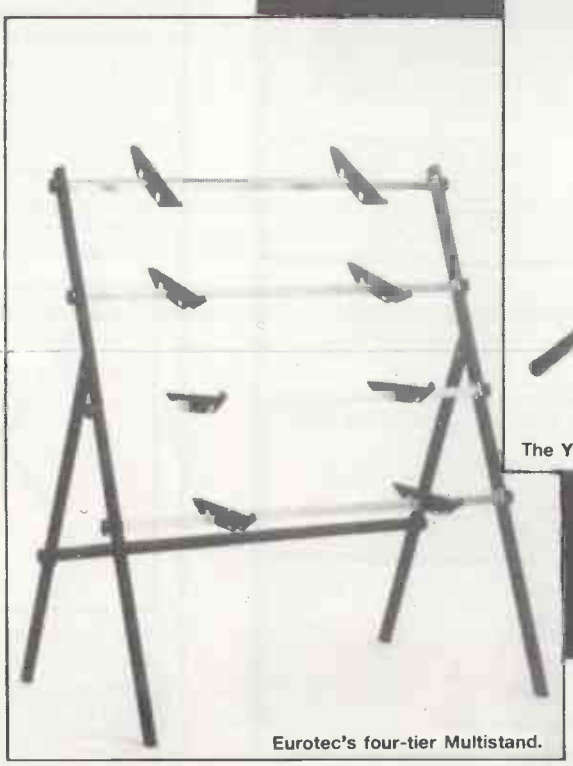
Generally, the fewer bits (and specialist tools needed for assembly) that can get mislaid, borrowed or left behind, the better.

Then there are the more specialist considerations peculiar to each individual. Can a free-standing keyboard such as a Rhodes or Electric Grand fit snugly below a couple of tiered synths (some stands come with extra long bars), and can the unit be adapted to provide a 'table top' for convenient placing of sequencers and drum machines? Can you buy extra-long support arms for unusually deep keyboards, and finally, does the manufacturer provide a carrying case for protection? ▷

The Mainframe double-tier stand.



The Yamaha YSX.



Eurotec's four-tier Multistand.

DOUGIE'S
Music Store

5–7 CHESTER ROAD, NORTHWICH, CHESHIRE
TELEPHONE 0606 782522
OPEN 10–6 (CLOSED WEDS – BOTH BRANCHES). LATE NIGHT THURSDAYS

FLASH STREET ELECTROMUSIC
(ABOVE JAMM STUDIOS)
END OF GT. MOOR ST.
BOLTON, LANCS.
TELEPHONE –
0204 397893

YOU–NAME–YOUR–OWN–PRICE–SALE!

EVERY MUSIC STORE ALWAYS HAS STOCK THAT 'STICKS' HERE IS A UNIQUE CHANCE TO GRAB A BARGAIN

THE FOLLOWING ITEMS MUST SELL BY JUNE 15TH; AFTER EACH ITEM (THE PRICE) IS OUR RESERVE PRICE (R) ANY OFFERS ABOVE THAT WILL BE CONSIDERED, BEST OFFER SECURES

ARP AXE S/H ..... £99(R)	SEQUENTIAL SIXTRACK, MINT.... £399(R)	HOHNER DUO NEW ..... £199(R)
ARP PRO. D.G.X. MINT ..... £150(R)	POLYMOOG K'BD, S/H..... £399(R)	YAMAHA CE20 NEW ..... £299(R)
ARP OMNI II, MINT ..... £299(R)	OSCAR NEW..... £425(R)	KORG CX3 NEW ..... £350(R)
YAMAHA SK20 S/H ..... £350(R)	MOOG ROGUE S/H ..... £99(R)	RHODES 88 (DOMESTIC) NEW ..... £399(R)
YAMAHA SK500 NEW ..... £499(R)	KORG BX3 NEW ..... £499(R)	

TO CLEAR. (NO OFFERS PLEASE, WE'RE BRITISH) DYNACORD ELECTRO KIT COMPLETE WITH BRAIN + 15 CHIPS..... £999
(STANDS NOT INCLUDED PAL!)

NEWIES
X STANDS (COLOURED) OUR VERY OWN MAKE..... £20 EA POST FREE
TOA PA SYSTEM, SEQUENTIAL MULTI TRACKER, SEQUENTIAL TOM IN STOCK.

THE NEW MIRAGE BY ENSONIC – IN STOCK NOW..... £POA

FOSTEX – PEAVEY – ROLAND – SESSION – FENDER – ARIA

MAINFRAME™

Professional Keyboard Stands

Designed and Manufactured in JAPAN from high strength lightweight aluminium tubing for strength and rigidity. The Hi-Tech modular construction allows total freedom of adjustment for MAXIMUM versatility. Ideal for keyboards, sequencers, expanders, computers etc.
LIGHT – STRONG – VERSTILE.

Single Tier Stand	£79
Double Tier Stand	£99
3 Tier Stand (as shown)	£149
4 Tier Stand	£165

Available now from:
AXE MUSIC – IPSWICH (0473) 54996
AXE MUSIC – COLCHESTER (0206) 65652
CAMBRIDGE ROCK – CAMBRIDGE (0223) 316091
MUSIC VILLAGE – CHADWELL HEATH 01-599 4228
HONKY TONK MUSIC – SOUTHEND (0702) 553647
and all good keyboard stores soon.

Distributed in the UK by: KEY-TECH MUSICAL LTD.
Trade enquiries to: BRIAN BUTCHER. Tel: 01-310 4034

Standing Simply

The most popular type of keyboard stand is the X-type, which can handle just the one keyboard or, with an extension fitted, a second one placed on top and slightly further back. With its perforated, height-adjusting horizontal bar, the X-type is utterly straightforward to set up, relatively inexpensive, and folds away without the need to store lots of bits and pieces. Unfortunately, it's also rather inflexible, and chances are that with two synths stacked up at once, the lower machine's front panel will be obscured from view.

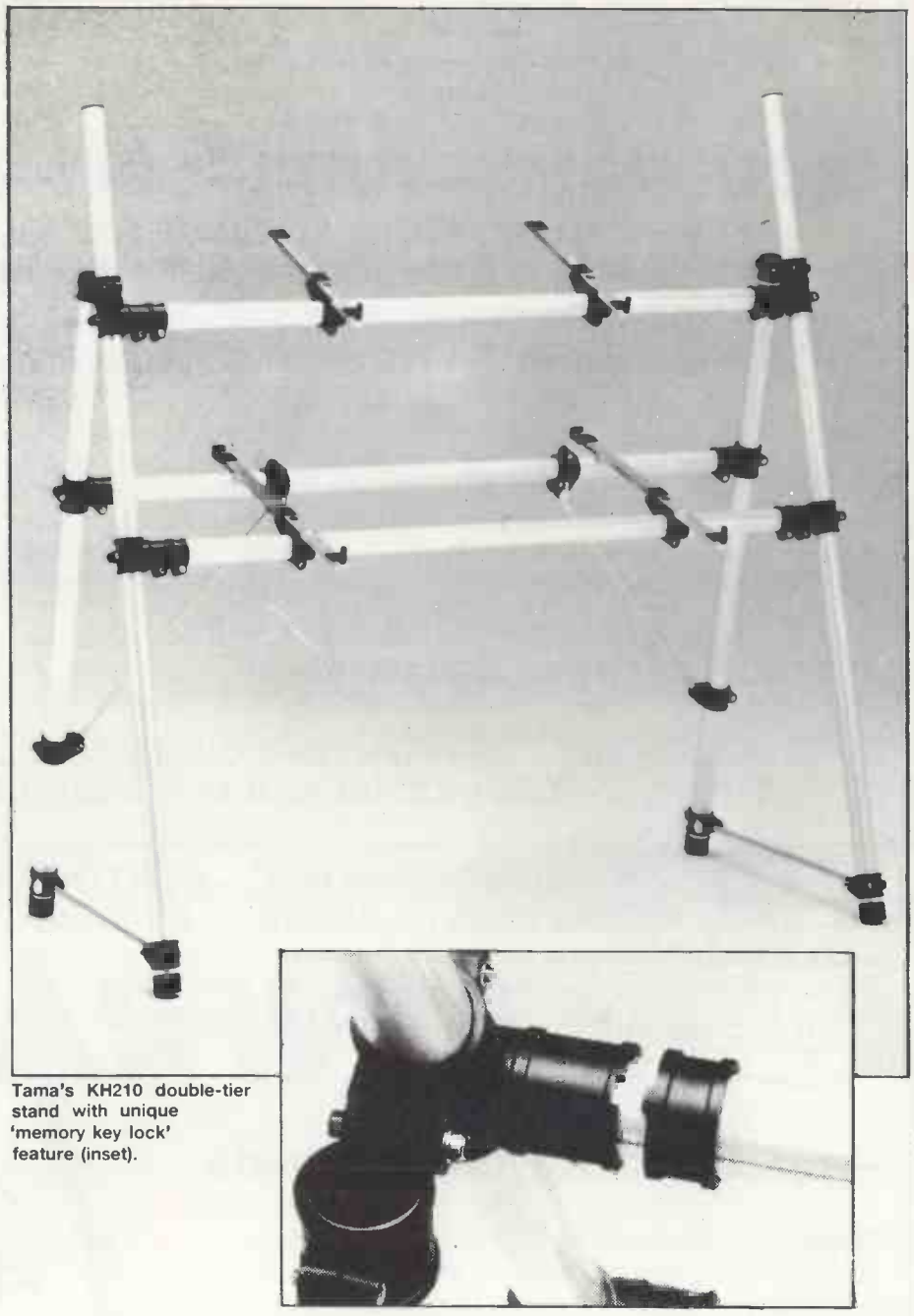
Anyway, of the couple of X-types beamed to the office recently, the **Yamaha YSX** can be used as either a single or double stand, with two extension screw-on arms to provide optional, adjustable backrests to prevent the top synth from diving into the audience. It's good value at just £33, with maximum and minimum heights for the lower level being measured at 93cm and 61cm respectively, and the higher level just 18cm away. However, bear in mind that at maximum height, the width span of the stand is just 28cm – only really suitable for balancing drum machines and sequencers...

Biggest criticism we can make relates to the security of the top supports. These have a tendency to revolve – with potentially disastrous results – unless the relevant knobs are hand-tightened *extremely* well. And in any case, these do no more than simply *grip* the lower bar, so perhaps some grooving or the odd screw-in knob (you need a clean mind in this job...) could be usefully employed here.

And due to the stacking method employed, the knobs that grip the bars don't waste much time in scraping away the otherwise classy matt black finish. Pity, too, that the height-adjusting bar isn't treated to the same black paint job, but left bare to the elements. Don't tell me looks don't count...

Sola Sound, meanwhile, follow a slightly different route with their **Eurotec Quickfold** stands. Finished in scarcely startling black paint, they provide two extension arms which grip by means of a ball bearing to the insides of the lower supports, at a height of some 28cm above the main part of the stand. However, a telescopic horizontal rod connects to both extension arms, securing them in an upright position and minimising any risk of slippage. Nice one – though as the extension unit is finished in nickel plating, it does have the appearance of being something of an afterthought, rather than an integral part of the stand's design.

Eurotec X-type stands come in two sizes: Standard – max height 91cm (width 36cm), min height 62cm (width 76cm), RRP £25 or £40 with extension; and Large – max height 122cm, min 101cm, RRP £26.50 or £41.50 with extension.



Tama's KH210 double-tier stand with unique 'memory key lock' feature (inset).

Tiers are Not Enough

Of course, if you're either rich or your name is Keith Emerson, you'll probably be more interested in the multiple-tier arrangement, which generally combines immense flexibility, good posing value, and quite often, an appropriately grand price tag. Sadly, the high value of the dollar means the excellent **Ultimate Support** stands are no longer considered a viable proposition for UK importers, but there's been no shortage of other manufacturers eager to take their place.

We begin back at Sola Sound, who have a foot in this camp as well with their **Eurotec MultiStands**. These come in three- and four-tier versions (£103 and £114 respectively).

All tiers are fully adjustable in both height and angle of tilt, with a width span of 116cm, a maximum height of 146cm, and support arms measuring about 37cm deep. In other words, a standard sort of spec all round.

Comments? Well, although the stand as a whole seems perfectly stable, the support bars do wobble slightly and can't be fixed in a set position on the tier. The fittings are a little fiddly to connect together – and to my weak heart, not entirely foolproof.

Finished in a durable black crackle-finish with chrome cross pieces, the cheap 'n' cheerful MultiStand could be the answer to many an impecunious keyboardist's prayer, even though some of its features don't inspire confidence.

Eurotec *also* make a Double Keyboard Stand, with a width span of 100cm and fully-adjustable tiers and tilts. This version is more upright than the norm and should accommodate a piano-type instrument underneath its tiers more easily.

Honky Tonk Music pounced on us recently with their **Mainframe** keyboard stand, distributed in the UK by Key-Tech Musical Ltd. Designed and manufactured in Japan from lightweight aluminium tubing, the single and double tier stands retail at £79 and £99 respectively, with a 107cm leg and 107cm tier width. The support arms, at present available only in a 36cm depth, can be placed at any point along the tier and are secured with the help of two large knobs; but as these control the *tilt* as well as the position, you've got to take a lot of care in ensuring that you tighten them securely.

The three- and four-tier versions, at £149 and £165 respectively, closely resemble the basic version, though with inside leg measurements of 160cm, and wider 122cm tier widths. Although I enjoyed its company only briefly, the only hassle I found with the Mainframe stand was in getting the cross-braces to slot into position in the relevant holes in the legs. Let's just say that if the initial assembly instructions are anything to go by, I'm only glad the review sample reached our shores ready-assembled. But take heart – partial disassembly (for carting it from gig to gig) is pretty straightforward. It seems additional tiers will be made available soon at around £20 each, in addition to various sizes of support arms, so building a personalised modular system certainly seems a viable proposition.

OutStanding

But of all the models currently vying for supremacy in the keyboard stand stakes, it's Tama that seem to be closest to usurping Ultimate Support's crown in their absence. Arriving in the UK *via* Summerfield, the Tama KH range is constructed from lightweight but durable aluminium, and finished in a very attractive 'platinoid' (let's just call it a metallic gold, OK?).

Perhaps the most striking aspect of the Tama stand is the degree of *thought* which has so obviously gone into its design; probably a hangover, I would guess, from all those years building drum hardware... The support arms should be quite unslippable thanks to the 360-degree, two-point locking concept (ie. two grooves which stop the support arm rotating), and a handy 'memory key lock' feature means that you can preset the tilt of the support arms so that they 'remember' the desired angle from gig to gig. Another nice touch is the second bar unit supplied with the lowest tier; this is placed on the rear legs and should, with the aid of the longer 55cm arms, provide ample support for even the heaviest of today's gigging keyboards. Better still is the fact that this arrangement can be adapted for table usage, *and* we believe Tama will soon be stocking the table top, too.. What for? Well, you know the sequencer, the drum machine and the pint of lager that you never know quite where to position at a gig? Well, now you can place them strategically below the keyboards for easy access...

Getting down to the nitty gritty and the amount that'll be debited on your next Visa statement is a bit difficult with the Tama range, partly because there are no less than six different packages available, and partly because the prices we've been quoted are 'guideline' retail prices only.

Basically, there's a choice of two tier widths (110cm and 130cm), which can also be purchased separately at £45 and £48 respectively; a choice of two leg heights (108cm and 138cm); and the option to purchase additional support arms (either 40 or 55cm deep). The basic one-tier KS110 stand will set you back a cool £175 and weighs in at a sturdy 5.4kg. Prices and weights progress from there till you reach the three-tier KH330 stand at £305. The range is wide enough to accommodate just about every requirement, though curiously, Tama's publicity material makes no mention of a four-tier model.

By the way, securing of tiers and arms is carried out with an allen key (supplied), with replacements (for when you lose it, as you inevitably will) costing a modest £3 a go.

As is the case with so many modular concepts, the theme of the Tama range seems to be adaptability and flexibility – but I'd suggest studying the brochure and checking prices carefully, as now and again it seems to work out cheaper to go modular (ie. buying the basic stand and adding a bar unit). All I can add is that these stands are *the biz*...

There is, however, another impressive-looking stand we never quite managed to get our hands on. Model in question is the **Prostand**, handled by Sequential in Holland and currently filtering into the UK through a number of retail outlets (Argents, Sound Control, and London Rock Shop to name but three). At present, only the **KS150 P** package is readily available, and this consists of three tiers of 122cm in length, with support arms measuring 36cm; it comes complete with a waterproof PVC-coated carrying bag. The brochure makes mention of optional tier widths and longer support arms of 51cm – so we'll just have to wait and see.

The features of the KS150 suggest this is a very easy stand to erect, and the support bars can be fastened to the tiers in any of six holes, giving a wide (albeit not infinite) range of width choices – they should put a stop to sideways slippage, too.

Incidentally, one feature common to every multiple stand we've looked at is the provision for adjustment of the support arms' front-to-rear settings, to allow a greater degree of comfort in the placing of keyboards.

So, in spite of the media silence, it seems the keyboard stand market is in a healthy and active state of mind. We know of two British companies currently beavering away designing yet more high-quality stands, now that Ultimate Support are keeping a low profile. The first seems set to be titled the **A-Frame**, while the other will emerge from good ol' Sola Sound. Exact details, we know not. As for me, I'd best be gone before I bump into the little black square that's coming up... ■

Further information from:

***Yamaha**, Mount Avenue, Bletchley, Milton Keynes, Buck MK1 1JE. ☎ (0908) 71771.*

***Sola Sound**, 18 Barton Way, Croxley Green, Rickmansworth, Herts WD3 3QA. ☎ (0923) 771110.*

***Honky Tonk Music**, 300-302 London Road, Hadleigh, Essex SS7 2DD. ☎ (0702) 553647.*

***Key-Tech Musical Ltd.** ☎ 01-310 4034.*

***Summerfield**, Saltmeadows Road, Gateshead NE8 3AJ. ☎ (0632) 770431.*

***Sequential**, PO Box 16, 3640 Mijdrecht, Netherlands.*

This is a Mirage.

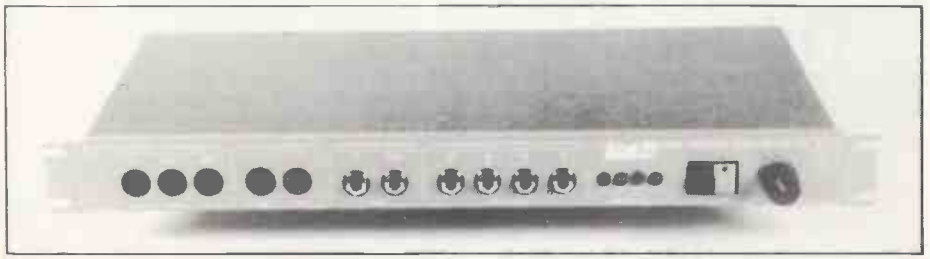
This is not.

The Mirage Digital Sampling Keyboard.
Rush to your nearest oasis before it's gone!
See facing page for details.

MIDI FX

The advent of MIDI has spawned an entire industry dedicated to producing auxiliary hardware. We take the wraps off four of that industry's latest products. *Tim Goodyer*

Jellinghaus MIDI Master Synchroniser



German company Jellinghaus Music Systems were one of the pioneers of home computer-based MIDI software. They introduced their first sequencing package in early 1984 (under the auspices in the UK of well-known distributors Rosetti), and if recent advance product news is anything to go by, further software developments are proceeding apace at their Dortmund headquarters.

Intended as a time dictator, the Master Synchroniser comes in a 1U-high, 19" rack-mounting format, something which, as you'll no doubt gather from the accompanying photographs, is proving rather popular among makers of MIDI accessories. Its only concession to the passage of time in the outside world is the appearance of a tape sync input (as well as output) on a front panel quarter-inch jack socket. In fact, all the relevant connections and controls are front-mounted, which is good to see, with the exception of the mains input.

Left to right across the front panel we find MIDI In, two MIDI Outs, two DIN sockets marked JMS and Sync, Tape Out, Tape In, Clock Outs for 96, 64, 48 and 24ppqn, four Program LEDs, a Program Select button, a Run/Stop button and a rotary Tempo control. Nothing remarkable about that.

Unhappily, the MIDI In of the review sample wasn't actually connected to anything, pending future development. But on the credit side, the MIDI Outs do provide outgoing MIDI clock information. The JMS DIN socket is provided for connection to the company's 12-track MIDI Recording Studio software package, whilst the Sync Out is committed to the Roland 24ppqn standard. The clock outputs all provide their designated pulse outputs simultaneously, but double in function to give footswitch Run/Stop control, 4ppqn and 1ppqn outputs by virtue of the ring on the stereo sockets.

The Master Synchroniser offers four alternative operational programs, covering such

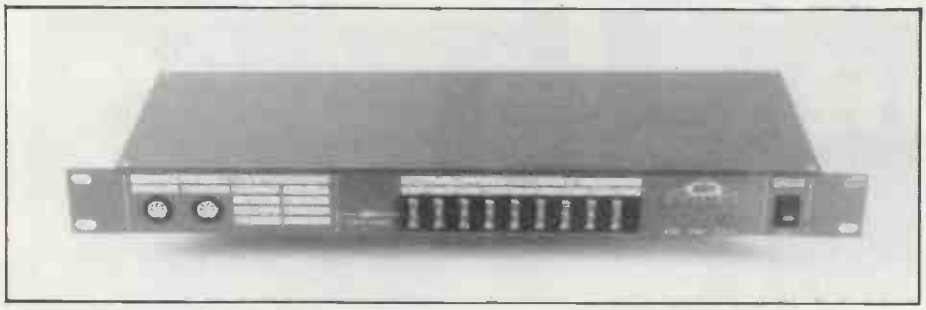
delights as master synchronisation (Program 1), syncing to pulses from tape (2), and delegation of run/stop responsibilities to the footswitch (3). The fourth program is not currently implemented, being reserved for future development in the same way as the MIDI In connector.

As for using the Master Synchroniser, there's really nothing to it. Why, there isn't even a mains switch to hunt around for (not Christmas present material, this one). Once all the required connections have been made to the front panel, the Run/Stop key starts the action at a rate determined by the Tempo pot, and stops it again when your creative imagination has had enough.

All in all, the Master Synchroniser performs to all the correctly-printed promises of its spec sheet. But whether that spec offers the sort of flexibility you're after obviously depends on both your equipment and your patience. Whichever way you look at it, a sync box that can act only as master and not as servant (it can only do the latter when synced to tape) isn't nearly as useful as one that can perform either task, like the Bokse machine we'll come to shortly.

As it stands, the JMS' major shortcoming is the dependance of its controlling tempo on a poorly-graduated rotary pot that receives no assistance from any kind of visual display. Any master machine deserves as precise a means of control over its activities as it can get hold of, after all.

Quark MIDI Link 999



The two British entries in this mini roundup both come from relative newcomers to the field. Quark are first and foremost a studio effects design company, but the MIDI revolution has seen many of their clients acquire complex synth systems, and it's in response to those studios' requirements that Quark have introduced the MIDI Link.

The Quark shares its rack-mounting dimensions with the JMS Master Synchroniser, but there the similarity ends. For whereas the latter's field of operations is timing and synchronisation between connected devices, the MIDI Link concerns itself with making the connections in the first place.

Briefly, it's a routing device capable of connecting nine input channels to nine output channels carrying MIDI information – note that these are *not* MIDI channels.

The front panel plays host to the first two of nine five-pin DIN inputs, nine thumb-wheels assigned to outputs 1-9, and the mains on/off switch. The rear panel picks up where the front panel left off, with the remaining seven input sockets – inputs 3-9 – and all nine output sockets. If you hadn't guessed it already, it's this input/output configuration that gives the Quark its '999' identifying tag – no emergencies here.

At its most basic, the idea of the MIDI Link is that any of its inputs can be routed to any of its outputs simply by setting the output thumbwheel to the required input channel number. And as far as that goes, it succeeds admirably. What it also facilitates is the connection of any number of its outputs to the same input, and the grouping of several outputs assigned to certain inputs. It is not, however possible to route more than one input to any output.

There's not really a great deal to say about the MIDI Link – it certainly works. The thumbwheels take a little getting used to but work well enough in allowing both incrementation and decrementation. You can wind them forwards as well as backwards, and that's good news if you've ever passed the seven o'clock mark for the third time when trying to set your alarm clock *without* verbally incurring the wrath of God.

The presence of the first two input sockets on the front panel is a nice touch as it gives a welcome alternative to leaning over the unit in order to patch something in a hurry, but why stop there? If you're aiming to eliminate all the tedious crawling about at the back of gear that switching MIDI cables entails, you might as well go the whole hog and eliminate crawling about at the back of the routing device as well.

One thoughtful front panel *inclusion* is an area for personal chinagraph hieroglyphics appropriate to each input and output channel. They should prove a real help when you're trying desperately to get your Synclavier working in sympathy with an electric chair but have forgotten who's plugged into what.

So, the 999 is a neat little routing box that does its job with about a 90% degree of excellence. For slightly less than that (and for correspondingly less outlay), Quark also offer the MIDI Link 448, which allows four MIDI controllers to address eight slaves on four busses. It costs £100 less than the 999.

Jellinghaus CGX Interface

Yes, another 1U-high, 19" rack-mounting MIDI accessory, but this time with a purpose of some novelty: to bridge the frustrating gap between the composing power of MIDI sequencers and those treasured synth sounds that previously remained out of its reach, locked inside a box with only CV and Gate access.

In fact, Jellinghaus' machine is the first MIDI-to-CV interface to become available, at least in the UK. We'd hoped to get Roland's version (the MPU101) in for review in time for inclusion in this feature, but it wasn't to be.

So, from left to right the front panel provides us with MIDI In and Thru (one of each), Pitch and Velocity outs on standard quarter-inch mono jack sockets, positive and negative Gate outs, two Program LEDs, two momentary switches (a red one for program selection and a black one for MIDI channel selection), a seven-segment LED display that shows the MIDI channel in use and, finally, two rotary pots – one each for glide (portamento) and velocity.

And what that layout effectively allows you to control is the facility to take a MIDI output from a suitable source, convert it into CV and Gate format, and offer it for use on the CGX's jack outputs.

The Control Voltage appears, unremarkably, at the Pitch jack, while the Gate has the dual honour of taking both positive and negative forms – V-trigger and S-trigger to those in the know. The MIDI input is restricted, for some reason, to Channels 1-8 (but crazily displayed as 1-0), yet gave quite satisfactory control over a MiniMoog from a DX7 and a Casio CZ1000.

So much for the basics. According to Rosetti's literature, the choice of programs simply avails you of either high-note priority (Program 1, red LED) or low-note priority (Program 2, green LED). But whilst the latter worked exactly as promised, Program 1 gave *last*-note priority – not, to my mind, such a useful facility. One other point on this. The interface ignores previous note information on depression of a subsequent key, and this means you can no longer play flashy trills by holding one key down and repeatedly pressing and releasing another, since the held key is ignored from the moment the second key is pressed. A shame.

The Glide function worked as anticipated, but would probably benefit from the inclusion of a Defeat switch, so that you could leave a preset glide speed to be switched in when required.

This is where things start to get interesting. The Velocity pot works (not surprisingly) in conjunction with the Velocity jack, and together, the two offer a form of velocity-sensitivity for yer all-but-discarded, monophonic, CV & Gate synth. The Velocity jack takes the velocity information from the MIDI source and allows you to route it to any parameter over which your CV & Gate synth allows you to control, with the Velocity pot limiting its effect as required.

For a strange mix of old and new technologies, this system works satisfyingly well when patched to filter cutoff frequency or VCA parameters. It's even possible to substitute it for the pitch (CV) control for more unorthodox sound effects, the key velocity subsequently determining the pitch of the note produced.

Well, with the exception of the discrepancy between promised and actual operation of its Program 1 function, the CG X Interface performed extremely well. The greatest value of a unit like this is the way it allows MIDI sequencer control – including routable velocity sensitivity – over CV & Gate synths.

Only question is, do you value your MiniMoog sounds so highly as to make them worth £200 worth of MIDI control options?

Bokse US8 Universal Synchroniser

And so we go out pretty much as we came in, with another interface box designed to act as a synchroniser for just about any assortment of clocking gear you may have managed to accumulate – no matter how motley. Like the MIDI Link, the US8 is the product of a relatively unknown company. Bokse Audio are a relatively small operation not unlike Quark, but as I soon discovered, their first music-related product is as good if not better than almost all its immediate competition.

The US8 is capable of taking an incoming clock pulse of just about any description and using it, or its own internal clock, to derive an even more comprehensive selection of output alternatives. To dwell, momentarily, on the US8's internal clock, its tempo is set either by adjustment in conjunction with the beats-per-minute indication that's part of the illuminated display on the front panel, or by a tap facility that takes an average time over four beats tapped-in from the button provided (or rear panel footswitch jack), with the tempo being displayed accordingly.

Occupying the left-hand extreme of the front panel, the Bokse's input alternatives begin with a MIDI In socket (accompanied by a MIDI Thru) for MIDI syncing, followed by the inevitable five-pin DIN sync socket and Jack Hi and Jack Lo connections, for instrument sync and tape sync respectively.

Since the US8 only sets out to sync to one source at any one time, the input is determined by use of the Input button followed by the Select switch; the latter lets you step through MIDI, DIN 24, DIN 48, Jack 12, Jack 24, Jack 48, Jack 96ppqn and Auto (internal) options. For tape syncing, Bokse recommend that 96ppqn are fed to the Jack Lo input.

Moving from in to out, the other side of the central display houses jack outputs for Variable, Click, 384, 96, 48, 24, 12ppqn, Sync and MIDI; any or all of which may be used simultaneously. On the rear panel, jacks for +5V, +10V and Short to Ground are to be found, along with a rotary control giving a choice of Variable, 12, 24, 48, 64 and 96ppqn; these can also be used concurrently with the front panel options.

What all this offers is perfect synchronisation with everything from the Fairlight to the Korg DDM110 (you must own *something* in that category) using interfacing techniques that should be well-known to the majority of E&MM readers. Still, I guess the variable output might need a bit more in the way of explanation. It has a similar configuration to the one used to select the input source, in that a variety of outputs is available. These are ten different note divisions – from semibreve to demisemiquaver – and five 'customised outputs'. The note divisions allow, for instance, a sequencer to be stepped regularly at the selected pace through each bar of a song, while the customised outputs give *irregular* stepping in a number of useful patterns. Whilst these patterns are predetermined and not user-programmable, Bokse will alter them to your personal requirements on request.

It's difficult, trying to explain the operation of the US8 fully in such a short space. But the unit works well right down to the smallest detail (like providing for the Roland start/stop signal), and deserves to receive a lot of favour in recording studios. The only, fairly minor, criticism I have to offer is the dedication of the front panel sync output to 24 pulses per quarter note. In the context of such a well-considered piece of equipment, it's annoying to have to make a jack-to-DIN lead in order to slave a Korg DDM220 to a Roland TR606. But if that's the most of your problems... ■

Prices and Addresses

JMS MIDI Synchroniser (£249) – *Rosetti Music Systems, 138-140 Old Street, London EC1V 9BL. ☎ 01-253 7294.*

Quark MIDI Link 999 (£249 + VAT) – *Quark Limited, 16-24 Brewery Road, London N7 9NH. ☎ 01-609 8282.*

JMS CGX Interface (£199) – *Rosetti, see above.*

Bokse Universal Synchroniser US8 (£350) – *The Bokse Company Limited, The Old Bakery, Litlington, Nr Royston, Herts. ☎ (0763) 852946.*

A Professional Remote Keyboard for under £200

Before now you could probably have got one for that price if it had been blagged off the back of a lorry!

But an even better way is to zip down to your local Yamaha stockist and he'll sell you a KX5 for an incredible £199! (rrp. £449).

We must be mad, we're virtually giving them away. But as you know, all good things come to an end so this is strictly for a limited period only - while stocks last!

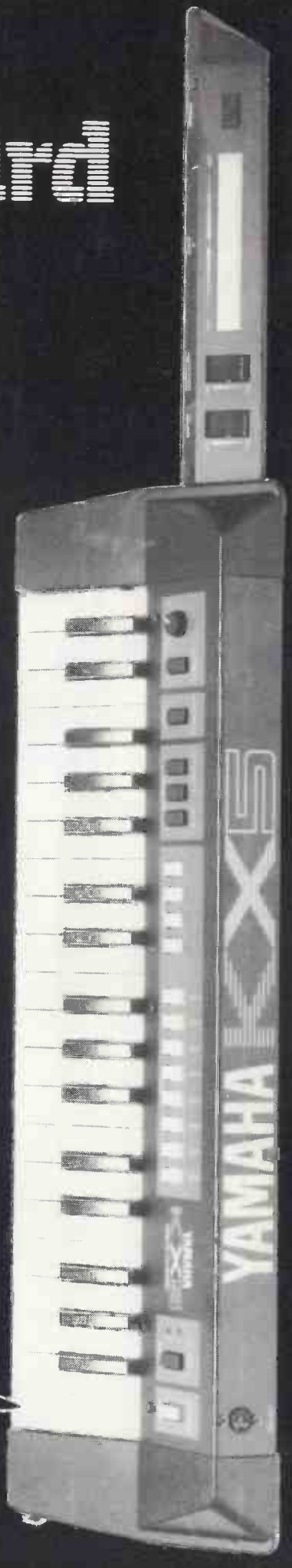
The KX5 Remote Keyboard. Performance control of any MIDI keyboard without physical restriction.

Specifications: 37-note Keyboard ● MIDI compatible ● 32-way programme select ● Velocity/Pressure sensitivity ● 3-Octave transpose ● Mono poly modes ● Touch-strip pitch bend ● Volume/Modulation wheels ● Portamento control ● Sustain ● Breath control facility ●

YAMAHA
MUSICAL INSTRUMENTS

● MOUNT AVENUE, BLETCHLEY, MILTON KEYNES, BUCKS, MK1 1JE
☎ (0908) 640202 24hr Ansaphone (0908) 649222

£199
suggested selling price



Casio CZ5000

Programmable Phase Distortion Polysynth with Sequencer

Their first two pro keyboards were revolutionary enough, but Casio's 'upmarket' polysynth – and the sequencer that's built into it – could put an even bigger cat among the pigeons. *Simon Trask*

Scarcely has the synth world had time to recover from Casio's (belated) entry into the market, and the company already have a follow-up on the stocks and raring to go. The CZ5000, as the latest addition is imaginatively called, employs the same voice architecture as its CZ predecessors, but now there are twice as many voices (16 in single DCO mode, 8 in double DCO mode); the Tone Mix (ie. dual) mode, monophonic on the 101 and 1000, is four-voice polyphonic; and a Keyboard Split mode has been introduced. Split point is adjustable over the whole range of the keyboard, with separate volume levels assignable to each side of the split; Mix and Split modes are mutually exclusive. Other additions are a modulation wheel (with adjustable mod depth and on/off button), and stereo chorus (implemented on a single master slider as rate and depth are not separately adjustable).

But these new features alone wouldn't exactly justify the extra cost of the CZ5000 over its still-young predecessors. What really sets the Big Brother Casio apart is an eight-track real- and step-time sequencer, something I'll be going into in some detail as we progress.

Front Panel

You know, something tells me Casio haven't quite got their hi-tech aesthetics act together just yet. Whilst the CZ1000's gaudily-coloured membrane switches make it look not unlike a tacky version of the DX7, the 5000 reminds me of nothing more than a high-tech Scrabble board, with row upon row of pale blue, grey and pink buttons simply asking to be slid along the channels into which they're recessed.

Still, beauty is in the eye of the Editor (who quite likes the look of Casio's latest), and whichever way you look at it, the layout is at least orderly and easily understood. Each button has its own LED which lights up when the button is pressed, and most switches have only one function assigned to them, so no need to remember a whole load of 'Shift' possibilities here. The dual row, 16-character LCD of the 101/1000 has been retained, along with the cursor that can be moved between any of four options. Which is a good thing, because it's an arrangement that allows a sensible amount of information to be viewed (and accessed) simultaneously.

Lurking at the left-hand end of the front panel is the ominously-titled 'Total Control' section, which actually governs master tuning, key transpose, portamento and glide selection, together with master control of volume and stereo chorus.

Next one along is the Mode section, which allows selection of Normal, Tone Mix, Key Split and Sequencer modes, and gives access to the Casio's various MIDI functions. Beneath this is the Programmer section, which governs patch selection and storage.

Centrally placed is the Data Entry section, which is where the LCD window and associated controls are to be found, and next to this are the Data Save/Load and Effect sections, the latter governing portamento, glide, bend range and modulation depth. The Parameter section is where all the sound generating elements are accessed. The layout of this section will be familiar to any 101/1000 owners, which is not in itself surprising, as the sound circuitry is exactly the same. Next to this, and completing our guided tour of the front panel, comes the inauspicious-looking but rather effective Sequencer section.

Sounds

For a description of Casio's Phase Distortion system of sound synthesis, you'd best look back to Paul Wiffen's review of the CZ101 (E&MM January 85), which also has some pretty pictures to help clarify the subject.

As I've already pointed out, the CZ5000 has the same voice architecture as the 101/1000. However, the deluxe model presents you with 64 sound patches onboard (32 preset and 32 programmable), arranged in eight banks of eight. A smaller number of presets might have been desirable, but there you go. Many of the sounds from the 101/1000 are included on the 5000, some benefiting from the increased experience of Casio's programmers, others remaining unchanged. So the overall standard is still remarkably high, and it isn't just a question of a couple of voices being outstanding; the range of sounds is too wide for any of the 5000's presets to be an isolated goody. The CZ strong point is still ear-piercing metallic rings of DX strength and clarity (though just bear in mind this *isn't* FM synthesis on the cheap), but there are some pretty impressive 'analogue' sounds in the 5000's armoury, too.

The main improvements on the sonic potential front have resulted from the increased number of voices, the improved Tone Mix facility, the new keyboard split facility, and the multi-timbral sequencer.

Each voice consists of two DCOs, two DCWs (Digitally Controlled Waves), and two DCAs. The similarity of this architecture to the traditional analogue VCO, VCF and VCA hierarchy makes it easily approachable for all but the most inexperienced of synth programmers, and most parameter value changes have an effect that's both recognisable *and* easily attributable to the parameter in question.

Each DCO can generate any of eight waveforms: sawtooth, square, pulse, double sine, saw-pulse and three kinds of 'resonance'. Any two of these waveforms can be

combined within one DCO (except the resonance waveforms, which cannot be paired), giving a fair range of base material to be worked with even before you get into the realms of dual DCOs.

Individual eight-stage envelopes are available for each DCO, DCW and DCA, and these affect pitch, timbre and amplitude respectively (but then, you'd expect that, wouldn't you?), which means plenty of scope for time-variable sounds here. What's more, each step has its own rate and level settings.

The DCW and DCA stages each have a Key Follow facility, with user-adjustable amount. The higher the pitch of the key you press, the smaller the amount of effect introduced; in the case of the DCA, the amplitude envelope gets shorter as the pitch gets higher. This is nothing new, admittedly, but nonetheless good to see on a synth in the 5000's price range.

Real-time Sequencer

Real-time sequencing is nothing new to Casio. Hands up all those who remember the CT7000 home keyboard from a couple of years back, which sported a two-track sequencer whose input configuration is, in fact, rather similar to that of the CZ5000. Thus, the new synth uses tape recorder-style controls, with Reverse and Forward keys in addition to the more usual Play, Stop and Record. Also included is a Reset button, which returns you to the beginning of the sequence. Forward and Reverse seem not to go any faster than the maximum Play/Record tempo, which is still a bit on the slow side when it comes to wanting speedy access to any part of your epic. I could be wrong, but I remember the CT7000 being much quicker than this.

Basically, the CZ5000 comes equipped with an eight-track, eight-voice real- and step-time sequencer offering 6800 step storage in step time and 3400 note storage in real time. A better spec, in fact, than that shortly to be offered by Casio's forthcoming stand-alone MIDI sequencer, the SZ1 (at least if prototype figures are anything to go by). But the really good news is that what we have here is a *multi-timbral* sequencer, similar to that offered by Sequential's modern-day polys, on which each track is capable of being assigned its own voice patch. Each track can have as many voices assigned to it as you like in real time, providing, of course, you don't exceed eight voices in total. In step-time mode, however, each track is confined to monophonic input.

In terms of additional MIDI info, the sequencer can store patch changes in both real and step time, but sadly pitch bend and mod wheel usage is disabled during Record, even though both wheels can be brought into action for playing in real time over an already-recorded sequence. Each track can be sent out over a separate MIDI channel (more on this later), and can also be assigned its own volume level onboard, which is jolly useful.

Real- and step-time sequences reside in the same area of memory, and only one sequence can be held in memory at any one time (unless, of course, you assign different tracks to different sequences, as tracks can be turned off at will – but remember that you're still limited to eight voices spread across all the tracks). Track memory is dynamically assigned, and Casio have thoughtfully provided a readout of the percentage of memory still available.

> 'Casio can hardly be accused of skimping on the sequencer; they've even managed to cram in a step-time section as well.'

There's a built-in metronome click to assist recording in real time, and this can be set to one of three levels of audibility, which is useful if you don't want to be deafened during a quiet passage, but are also wary of being left all at sea during a more excessive excursion. It's also possible to disable the metronome entirely – handy if you want to use a drum machine.

Talking of drum machines, MIDI Start, Stop and Continue codes are all supported by the 5000's sequencer, which means your sequence should synchronise perfectly with any MIDI drum machine or sequencer. The 5000's sequencer can control a MIDI drum machine/sequencer in both playback and real-time record modes, and can also be controlled by a MIDI drum machine/sequencer in playback mode.

Real-time editing facilities aren't exactly plentiful, but there is a handy drop-in facility that makes it possible to 'rewind' to any point and resume recording. The sequencer will only drop in when you play, so the rest of your recorded material is always preserved intact, thank goodness. Thus, you can correct any errors as long as you do so before exiting Record mode.

Step-time Sequencer

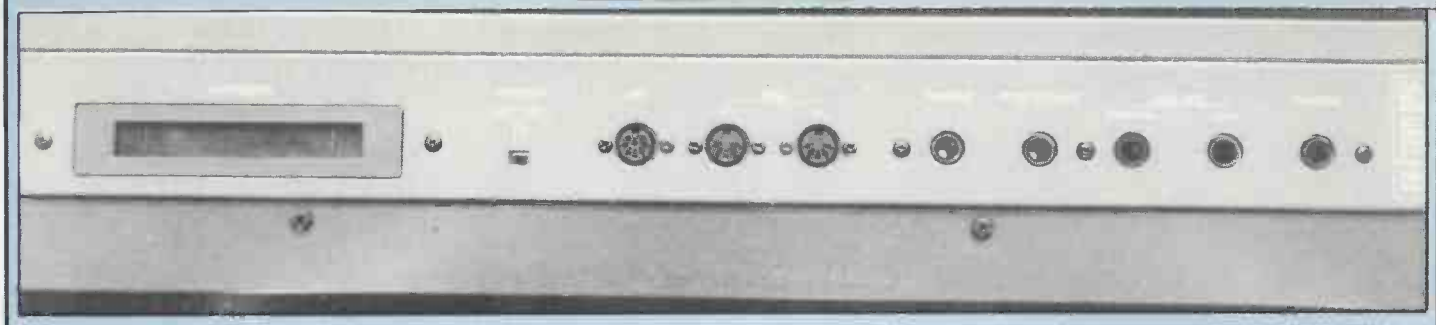
All in all, Casio can hardly be accused of skimping on the sequencer side of the CZ5000; they've even managed to cram in a reasonable step-time section as well. This is selected by pressing a button marked (for some reason best known to Casio) 'Manual', followed by one of eight Track Select buttons. You're then presented with the exhortation '001 Select Programmer!!', which can be translated into everyday English as 'select a sound'. And yes, it *does* get a bit irritating after a while. Most of the time, I found myself selecting a sound *before* calling up the sequencer, which meant that having to select it again became something of a nuisance. Maybe I'm just difficult to please...

Once you've selected your voice, its name is displayed in the LCD window, and you're given the opportunity to choose whether or not you want portamento or glide. Next, pressing the Forward key takes you forward through each step, while Reverse does the opposite. Logical enough.

I have to confess to finding the step-time sequencer disconcerting to use at first. However, things soon began to fall into place, and you soon begin to appreciate what good use Casio have made of the limited possibilities afforded by the size of the 5000's display. Believe it or not, they've managed to get information relating to three steps onto the LCD at the same time, with the currently-selected step being displayed in the centre within corner brackets.

Duration (anything from demisemiquaver to semibreve) has to be selected prior to pitch or rest data. The latter is accessed by means of a Rest button (ha!), while pitch is selected by pressing the relevant note on the synth keyboard. And what puts this (fairly rudimentary) step-time package ahead of so many micro-based programs is that if subsequent durations remain unchanged, it isn't necessary to re-input a duration for each note – which means you can effectively play in real time if the mood takes you. The LCD shows duration (notes and rests) in 'proper' musical notation, while pitch is shown as note name plus octave number.

It's possible to insert patch changes, and to turn portamento or glide on or off, at any point. Notes may be dotted or tied, or even given



triplet status. And that's not all. Any section of the music may be repeated up to eight times or, beyond that, an infinite number of times. ('Where will it all end?' I ask myself.) Just about the only thing you can't do is nest repeats, ie. place them inside one another. Not a very serious omission, all things considered.

Also implemented is a first/second time repeat facility, whereby one section of music is played the first time round and another section the second time around. This can be used any number of times, but as with the straight repeat facility, cannot be nested. However, both types of repeat can be used within the same track.

Yet in spite of Casio's design team making a pretty good shot at getting a quart in a pint-pot, it seems unlikely the step-time sequencer will be used to its fullest capabilities, simply because there just isn't enough visual feedback to make such usage anything less than a trial. Still, there's probably scope for some enterprising software house to come up with a step-time program link-up for the 5000, complete with much-needed music notation display. This would (a) ease the musician's plight considerably, and (b) make the CZ5000 an even more attractive proposition from even the casual composer's point of view.

But getting back to what the 5000 offers as it stands now, it's possible to record tracks in step time and then play/record over them in real time – a feature which will no doubt please a lot of people. You can't, however, edit step-time tracks in real-time mode or vice versa. Pity.

One *really* annoying feature of the sequencer is that it offers no way of deleting leading beats, so that each repeat is preceded by an interval of silence – not quite what most musical applications require, all in all.

Connections

As well as the already familiar cartridge port, memory protect on/off switch, headphone socket and MIDI In and Out connectors, a few extra features have found their way onto the CZ5000's rear panel. There's an eight-pin DIN socket for cassette storage purposes (or 'memory transfer', as Casio would have it), plus sustain and volume pedal sockets and stereo line outs (with a mix output from the right socket). A maximum of 32 patches can be stored on a cartridge (which also just happens to be the number that are held in internal memory), whilst both patches and sequences can be stored on tape.

It's helpful to look upon the CZ5000 as having four MIDI modes (Normal, Tone Mix, Key Split and Sequencer), each of which has its own MIDI 'page'. All modes have a patch change enable/disable option that works for both MIDI transmission *and* reception, and all modes allow the Basic Channel to be independently set for transmission and reception.

'Normal' allows selection of Poly or Mono modes. In Poly mode, you can set any of the 16 channels for transmission or reception, while Mono mode allows any channel to be selected as Basic Channel, and any number of voices up to eight to be selected for MIDI reception (though selecting a Basic Channel higher than eight automatically reduces this number, of course). The crucial point is that each channel can be assigned its own patch; this effectively turns the 5000 into a multi-timbral MIDI expander – an excellent feature that deserves to receive more than the bonus status likely to be afforded it by the marketplace.

> 'Whereas the Americans favour the warmth of analogue textures, Casio have put the emphasis on digital clarity – and succeeded rather well.'

Tone Mix and Key Split modes are as for Normal, but without the Mono option. Sequencer mode is automatically in Omni off/Mono mode with its Base Channel fixed on Channel 1, but instead of sending out one voice per channel as the MIDI 1.0 spec states, the 5000 assigns one *track* to a channel. So if you record a track in four-note polyphony, say, those four voices are all transmitted on the one channel.

Believe it or not, Trask has actually succeeded in gleaning all this without the help of any MIDI documentation specific to the 5000. Now, that isn't so important in the context of a first-in-the-UK review model, but I hope Casio can provide their upmarket poly with a bit more in the way of helpful bumpf than they gave the CZ101/1000.

After all, the 1.0 spec does say 'So that other users can fully access MIDI instruments, manufacturers should publish the format of data following their ID code'. Casio don't even get as far as publishing their ID code (it's 44 hex, by the way), which is a shame when their design team seems to be trying harder than most to get the best out of MIDI. Come on, guys, this is hardly conforming to the spirit of open communication, is it?

Conclusions

The onboard sequencer obviously accounts for a large part of the price difference between the CZ5000 and its two smaller brothers, and happily, it's rather a neat little device. So by comparison with the 101/1000, the new machine gives you twice the voicing power for twice the money – but with an excellent polyphonic recorder thrown into the bargain. At the same time, the 5000 competes well on its own terms with synths in the same price range – and with some that are a lot more expensive. The flexibility of its multi-timbral voice arrangement can be matched only by Sequential's offerings in the same market area, but soundwise the two companies are poles apart. Whereas the Americans favour the smoothly-rounded warmth of analogue textures, Casio have put the emphasis on hard-edged digital clarity – and succeeded rather well. But unlike Sequential, they've so far failed to make the most of a multi-timbral facility by giving the 5000's voices separate audio outputs. A small point, but it could make all the difference.

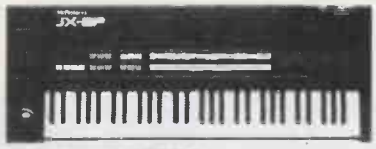
The pro polysynth market has never been busier than it is now, but Casio's flagship has more than enough in the way of sounds, facilities and accessibility to keep its head well above the water line. ■

Scheduled for availability mid-August, the CZ5000 carries an RRP of £975 including VAT. Further information from: Casio, Unit 6, 1000 North Circular Road, London NW2 7JD. ☎ 01-450 9131.

BRITAIN'S BEST CHOICE!

KEYBOARDS & EXPANDERS

	rrp	ABC Price
Roland JX8P NEW	£1325.00	**£1195.00**



Roland JX3P	£1095.00	**£699.00**

Roland Juno 106	£880.00	**£775.00**
Roland SH101	£385.00	**£220.00**
Roland MKB 1000 Mother Keyboard	£1665.00	**£1395.00**

Roland MKB 300 Mother Keyboard	£990.00	**£849.00**
Roland MKS10 Piano Module	£950.00	**£795.00**
Roland MKS30 Synth module	£875.00	**£755.00**

Roland MKS80	£1800.00	**£1495.00**
Roland HP450 NEW Piano	£1350.00	**£1195.00**
Roland HP350 NEW Piano	£1130.00	**£895.00**
Roland EP50 Midi Piano	£625.00	**Available soon**
Yamaha DX5	£2999.00	**Available soon**
Yamaha DX7	£1449.00	**£1299.00**
Yamaha KX5	£449.00	**£299.00**
Yamaha PF15	£1099.00	**£935.00**
Yamaha PF10 NEW LOW PRICE	£849.00	**£499.00**

Yamaha TX7 'DX7' Expander		**£699.00**

Yamaha KX88 New Midi Keyboard		**£1399.00**
Yamaha TX816		**£4199.00**
Casio CZ101 Midi Synth	£399.00	**£299.00**
Casio CZ1000 Midi Synth	£550.00	**£495.00**
Casio CT6000 Midi	£695.00	**£645.00**
Siel DK80		**£699.00**
Siel Expander 80 NEW		**£399.00**
Oscar Midi Synth		**£599.00**

Korg DW600 NEW	£1095.00	**£799.00**
Korg Poly 800	£625.00	**£499.00**
Korg PK100	£519.00	**£449.00**
Korg EX800	£479.00	**£399.00**
Sequential Max		**£399.00**
Sequential Six Tracs		**£499.00**
Sequential Multi Tracs		**P.O.A.**

HOME RECORDING AND ACCESSORIES

Yamaha MT44D	**£399.00**
Yamaha MT44	**£299.00**
Tascam Portastudio 244	**in stock**
Tascam Portaone	**£449.00**
Yamaha GQ1031 graphic	**£199.00**
Yamaha GQ2031 stereo graphic	**£399.00**
Yamaha RM602 mixer	**£249.00**
Yamaha PB35B patchbay & rack	**£149.00**
Yamaha G2020 compressor	**£229.00**
Yamaha R1000 digital reverb	**£499.00**
Yamaha D1500 digital delay	**£599.00**
Roland SDE1000 digital delay	**£399.00**
Roland SDE3000 digital delay	**£699.00**
Roland SDE2500 digital delay (MIDI)	**£599.00**
Roland SRV2000 digital reverb (MIDI)	**£1450.00**
Boss DD2 digital delay	**£155.00**
Boss KM60 6 into 2 mixer	**£175.00**
Boss BX400 mixer	**£86.00**
Boss BX600 mixer	**£130.00**
Boss BX800 mixer	**£235.00**

FOSTEX **STOP PRESS**

Fostex in stock NOW!

Fostex X15	**£299**
Fostex 250	**£699**

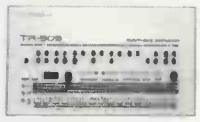
Plus all FOSTEX & ACCESSIT Accessories

YAMAHA CX5 MUSIC COMPUTER

CALL IN AND ASK ABOUT OUR AMAZING COMPUTER PACKAGE DEALS

CXME Music Computer	**449.00**
YK10 Full size keyboard	**£165.00**
YK101 Mini Keyboard	**£85.00**
YRM Music computer software ROM	**36.00**
YRM 102 FM Voicing software ROM	**36.00**
YRM103 DX7 Voicing software ROM	**£36.00**

DRUM MACHINES & SEQUENCERS



	rrp	ABC Price
Roland TR909	£800.00	**£395.00**
Roland TR707	£525.00	**£495.00**
Boss DR110	£150.00	**£125.00**
Yamaha RX15	£499.00	**£449.00**
Yamaha RX11	£799.00	**£595.00**
Korg DDM110	£256.00	**£225.00**
Korg DDM220	£256.00	**£225.00**

ELECTRONIC WIZARD

Ask about our customising and interfacing service – we can practically link anything to anything!

Tel: 01-546 9877

Roland MSQ100	£525.00	**£425.00**
Roland MSQ700	£950.00	**£825.00**
Roland JSQ60 Sequencer for Juno 106	£299.00	**£129.00**

WE MATCH OR BEAT ANY GENUINE ADVERTISED PRICE – YOU CANT BUY BETTER!

Roland TB303 Bassline	£290.00	**£149.00**
Roland TR606	£290.00	**£189.00**

Yamaha QX7 NEW!!	**£499.00**
Yamaha QX1	**£2499.00**

Amplifiers

Roland SCL40 Super Cube 40 NEW	**£199.00**
Roland SCL60 Super Cube 60 NEW	**£235.00**
Roland SCL100 Super Cube 100 NEW	**£235.00**
Roland SCB40 Cube 40 Bass NEW	**£195.00**
Roland SCB60 Cube 60 Bass NEW	**£249.00**
Roland JC77 Jazz Chorus	**in stock**
Roland Cube 40K Keyboard Cube	**£175.00**
Roland Cube 60K Keyboard Cube	**£249.00**
Carlsbro Hornet 45 Keyboard combo	**£179.00**
Carlsbro Cobra 90 Keyboard combi	**£269.00**
Carlsbro 150 Keyboard combo	**£399.00**
Peavey KB100 65 Keyboard combo	**£229.00**
Peavey KB300 130 Keyboard combo	**£340.00**

Up to 30% off *Korg, Roland, Casio, Yamaha, Sequential Circuits, Boss, Tokai, Aria, Westone, Peavey, Carlsbro, Tascam etc. — send for one of our Free info packs with details of our prices and 7-day money back guarantee.*

FREE HOLIDAY OFFER!

Buy any YAMAHA, ROLAND or CASIO Keyboard over £500 and we will give you **2 WEEKS FREE ACCOMMODATION** for 2 at any of a wide choice of UK hotels!

ABC music
for the modern musician

14-16 High St. Addlestone
TEL: 0932 40139/54877
56 Surbiton Rd. Kingston
TEL: 01-546 9877
324-326 Farnham Rd. Slough TEL: 0753 822754

OPEN TILL 7.00 PM THURSDAYS

If you are unable to visit one of our shops ask about our Instant Mail-Order Service. Phone your credit-card FOR SAME DAY DESPATCH.

Please supply .....

I enclose £ ..... Access or Barclaycard No. .....

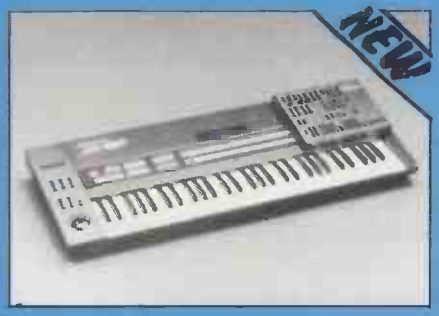
Name .....

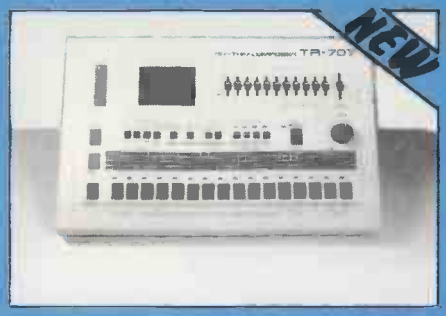
Address .....

.....

Day-time/Works Tel. No .....

Roland POWER PERFORMANCE





JX-8P
TOUCH SENSITIVE NEW DIGITAL/ANALOGUE POLY WITH OPTIONAL PG800 PROGRAMMER – AMAZING

TR707 DIGITAL MIDI RHYTHM COMPOSER
REAL/STEPTIME 69 PATT. MIDI GRAPHIC DISPLAY INDEPENDENT OUT

STUNNING PERFORMANCE FROM ROLANDS DIGITAL DRUM SYSTEM PCM SOUND MIDI IN/OUT EDITING PADS FULLY TOUCH SENSITIVE

THESE ARE JUST THREE OF THE REMARKABLE RANGE OF NEW ROLAND PRODUCTS BECOMING AVAILABLE PLEASE PHONE FOR FURTHER DETAILS

JX8P	TR707
JX3P	TR909
JUNO 106	DR110
SH101	SDE1000
PG800	SDE2500
MSQ100	SDE3000
MSQ700	SRV2000
GR700	ALL BOSS
GUITAR SYNTH	IN STOCK

ROLAND AMPS – NEW CUBES
SCC40 LEAD 40W.....**£245**
SCC60 LEAD 60W.....**£275**
SCC100 LEAD 100W.....**£375**
SCB40 BASS 40W **£225**
SCB60 BASS 60W **£295**
SCB100 BASS 100W **£365**
JAZZ CHORUS 77 80W.....**£475**

ROCK CITY
10 MOSLEY STREET
NEWCASTLE UPON TYNE
NE1 1DE
☎ 0632 324175
Free delivery in mainland UK

SEQUENTIAL CIRCUITS INC
MAX 6 VOICE POLY LETS YOU PLAY 6 COMPLETELY DIFFERENT INSTRUMENTS AT ONE TIME ULTIMATE MIDI EXPANDER (LOW, LOW PRICE)
MULTITRACK – NEW!!! FIVE OCTAVE VEL-SENSITIVE KEYBOARD CONTROLLING LOUDNESS, BRIGHT OR MODULATION, DIGITAL RECORDER, UP 1600 NOTES SUPER STACK LAYER FACILITY PLUS MORE
TOM – NEW!!! DRUM MACHINE PROGRAMMABLE TUNING/VOL/STEREO PAN FOR EACH INSTRUMENT TO PRODUCE SOUNDS /HRC/VERSE AMAZING MACHINE. POA.

SPECIAL PRICES ON ALL MAKES

ROCK CITY PRE-RECORDED RAMs
32 NEW SOUNDS INCLUDING ELECTRONIC PERCUSSION, SLAP BASS, HOWARD JONES/VAN HALEN BRASS, GUITARS, FAT STRINGS, ELECTRIC GRAND, RHODES, PLUS MANY MORE!
ONLY 55 SMACKERS!!
and ROCK CITY ROMs (64 new sounds) **£55.00**
OVER 500 NEW SOUNDS AVAILABLE FREE TO PURCHASERS OF RAMs/ROMs PLEASE PHONE FOR DETAILS

ROCK CITY EXCLUSIVE!!
TWIN DX PEDALS FOR PORTMENTO/SUSTAIN ONLY £29. PLUS, PUBLICTIONS ON DX SYNTHESIS AVAILABLE FROM STOCK.

THE NORTH'S MULTITRACK SUPERSTORE

YAMAHA

YAMAHA MT44 SYSTEMS	**£PHONE**
YAMAHA 6 CHANNEL MIXERS	**£PHONE**
YAMAHA R1000 DIG REVERB	**£PHONE**
YAMAHA D1500 DIG DELAY	**£PHONE**
YAMAHA STEREO COMPRESS/LIMIT	**£229**
YAMAHA 31 BAND GRAPHIC	**£199**
YAMAHA 27 BAND GRAPHIC	**£PHONE**
YAMAHA 2×31 BAND GRAPHIC	**£PHONE**

ALL YAMAHA AT AMAZING PRICES

IBANEZ DM2000 DIG DELAY	**£BEST PRICE**
IBANEZ DM1100 DIG DELAY	**£BEST PRICE**
VESTA FIRE RV1 REVERB	**£199**
VESTA FIRE RV2 REVERB	**£249**
ROLAND SDE1000 DIG DELAY	**£PHONE**
ROLAND SDE3000 DIG DELAY	**£PHONE**
KORG SD1000 DIG DELAY	**£PHONE**

FOSTEX

FOSTEX

FOSTEX X15	**£269**
FOSTEX 250	**£POA**
FOSTEX A2	**£POA**
FOSTEX A8	**£POA**

FOSTEX UNBEATABLE PRICE
MONITORS BY ELECTRO VOICE, TANDY, FOSTEX, YAMAHA ETC
MIXERS BY RAM, SEC, PROMARK, MTR, TRIDENT

WHEN YOU CALL ROCK CITY YOU TALK TO A PROFESSIONAL – SOMEONE WHO KNOWS HIS EQUIPMENT AND UNDERSTANDS YOUR NEEDS AND YOU'RE DEALING WITH ONE OF THE BIGGEST IN THE BUSINESS A THIRTEEN-YEAR-OLD COMPANY WITH HUNDREDS OF THOUSANDS OF POUNDS INVESTED IN THE VERY LATEST PRODUCTS AVAILABLE. SO CALL ROCK CITY ABOUT YOUR NEEDS. WE WILL GIVE YOU THE ADVICE AND HELP YOU DESERVE, WE'LL LOOK AFTER YOU LIKE LIKE NO OTHER

ROCK CITY YAMAHA

THE LEGEND GROWS FOR THE UK'S LEADING YAMAHA MEGASTORE!!!

DX5 FM DIGITAL SYNTHESIZER £2999

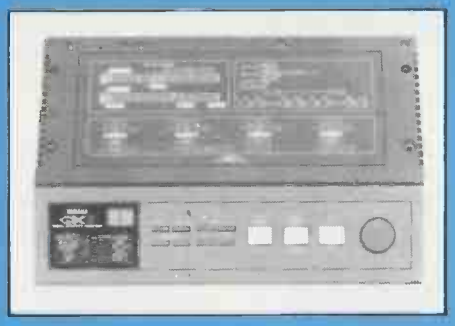
DX7 FM DIGITAL SYNTHESIZER

KX88 MIDI MASTER KEYBOARD £1399

COMING SOON – NEW SOFTWARE FOR THE CX5, INC. RX EDITOR AND FOUR CHANNEL REAL TIME SEQUENCER – PHONE US!

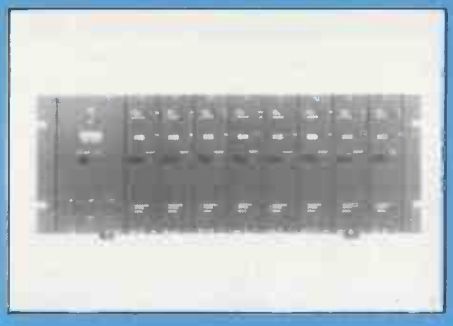
ALL PRICES ARE RRPs Please phone or write for your **SPECIAL YAMAHA PRICE!**

BEING NUMBER ONE IN THE UK FOR YAMAHA MEANS NUMBER ONE FOR PRICE AND SERVICE!!



QX7 DIGITAL SEQUENCE RECORDER £499

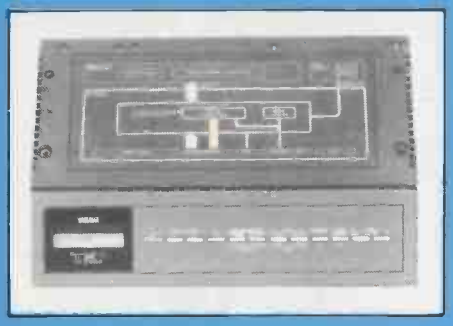
QX1 DIGITAL SEQUENCE RECORDER £2499



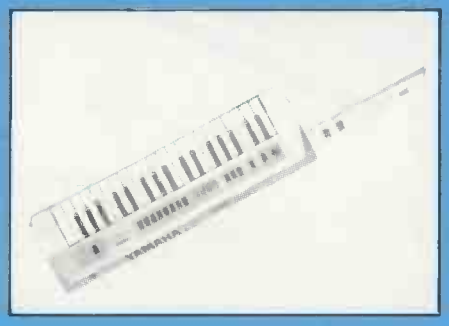
TX816 FM TONE GENERTOR £4199

TRY THE TEST NEXT TIME YOU LOOK AT A YAMAHA PRODUCT

LITERALLY EVERYTHING IN STOCK INCLUDING: DX/RX/CX/TX SERIES', THE PS RANGE OF KEYBOARDS, THE 9000 SERIES DRUMS, ALL GUITARS, POWER AMPS, MIXERS, P.A., ETC.
Please telephone for your special UK price on Yamaha
ALL DX7s AND CX5s SUPPLIED WITH FULL COMPLIMENT OF MANY NEW SOUNDS



TX7 FM TONE GENERATOR £699



KX5 REMOTE KEYBOARD – LIST £449
ONCE ONLY PRICE £199

RX11 DIGITAL RHYTHM PROGRAMMER

ROCK CITY

10 MOSLEY STREET
NEWCASTLE UPON TYNE NE1 1DE
☎ 0632 324175
Free delivery in mainland UK
Mail order–Access–Visa–American Express

IF YAMAHA MAKE – WE STOCK IT

Additional discounts for DX Owners Club members, please quote your membership number on all correspondence.
Being a club member will automatically entitle you to many benefits. Full details from Tony Wride on 0765 701855

FOR ANYTHING AND EVERYTHING TO DO WITH YAMAHA IN THE UK – IT HAS TO BE ROCK CITY!!!

PRICES INCLUDE VAT

EXPORT PRICES ARE LESS VAT AT 15%

J.S.G

INSTANT CREDIT

NO DEPOSIT HP

104/6/8B Main Street, Bingley, West Yorkshire, BD16 2JH.
Telephone: Bradford (0274) 568843/564389/561044.

YAMAHA HI TECH AUTHORISED DEALER

CX5M

CX5M PACKAGES – SPECIAL PRICES

	PHONE NOW
DX5	PHONE
DX7	BEST PRICE
KX88 Midi Master K/B	£1250
RX15 Digital Drums	BEST PRICE
RX11 Digital Drums	BEST PRICE
TX7 DX Expander	£649
QX7 Sequencer	£449
TX816 Modular DX System	£4239
QX1 Sequencer	£2499
PF15 Piano	£880
PF10 Piano	PHONE
KX5 Remote	PHONE
PS6100	PHONE
CLAVINOVA YP40	£875

SIMMONS

SDS9 kit ... RING FOR
SDS200 ... PRICES
SDS400 ... AND
SDS800 ... COLOURS

NEW

SDS8 Kit	£650
SDS7 Kit	£1875
SDS5 Kit	£995
SDS1	PHONE
SDS6	PHONE
SUITCASE Pads	£95
CLAPTRAP	£59

CHOICE OF COLOURS

ALSO IN STOCK

DYNACORD Kit	£995
TRAMA Kit	£875
MPC Kit	£599
ULTIMATE Percussion	£499
CACTUS Kits	£495

OPENING TIMES

MON	11.00 am–9.00pm
TUE	CLOSED
WED	10.30am–5.30pm
THUR	11.00am–9.00pm
FRI	10.30am–5.30pm
SAT	10.00am–5.30pm

ensoniq MIRAGE

DIGITAL SAMPLING KEYBOARD

AT THIS PRICE IT SOUNDS TOO GOOD TO BE TRUE

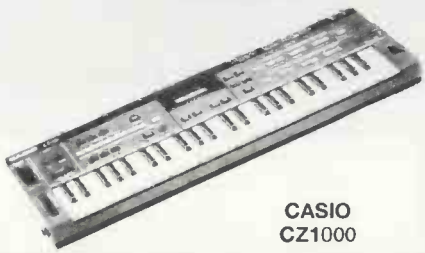
KORG

DW6000	£795
MIDI Pedals	£375
POLY 800	£475
POLY 61M (MIDI)	£595
RK100B Remote	£365
DDM-110 Drums	£199
DDM-220	£175
PSS50 Super Section	£275
EX800 – Poly 800 Expander	£295
KMS MIDI sync	£139

SEQUENTIAL CIRCUITS INC

MULTITRAK	PHONE
MAX	£499
SIXTRAK	£545
PRO600	£995
DRUMTRAKS	£795
TOM	PHONE
MODEL 64 Interface	£129

CASIO



CASIO CZ1000

CZ101	BEST PRICE
CZ1000	BEST PRICE
CT6000	VERY SPECIAL PRICE

FULL RANGE IN STOCK

KAWAI EP608 PIANO £995

KEYBOARD AMPLIFICATION

PEAVEY KB100 Combo	£229
PEAVEY KB300 Combo	£345
PEAVEY KB400 Top	£459
CARLSBRO K/B 150 Top	£239
CARLSBRO K/B 150 Combo	£385
CARLSBRO Cobra 70 Combo	£253
CARLSBRO Hornet 45 Combo	£169
McGREGOR 200 Combo	£395
McGREGOR 200 Top	£175
VOX 100w K/B Combo	£239
H/H K80 Combo	£235
H/H K100 Top	£195

Roland

JUNO 106	£775
JX8P	
MKB 1000 Mother	
MKB 300 Mother	
MKS10 Planet P	
MKS 30 Planet S	
MKS 80 Super Jupiter	
MPG 80 Programmer	
JSQ 60 Dig K/B Rec	£139
MSQ 100 Dig K/B Rec (MIDI)	
MSQ 700 Dig K/B (MIDI-DCB)	
SBX 80 Sync Box	
SVC 350 Vocoder	
M110 MIDI Interface	
MD8 MIDI-DCB	
MM4 MIDI Thro Box	
SH101 Synth	£199
AXIS Remote Keyboard	
HP 20 Piano	
HP 60 Piano	
HP 70 Piano	
HP 300 Piano	£695
HP 400 Piano	£895
TR 808 Drums	£399
TR909 Drums	£395
TR707 Drums	£465
TR727 Drums	£465
DR110 Drums	PHONE

OBERHEIM

XPANDER	£2995
OB-8	£2595
DX	£850
DSX	£1155

360 Systems

bit ONE

Polyphonic • 6 Voice • Touch Sensitive • Digital and Analogue

The BIT ONE £750

SIEL

DK80	£599
EX80 Expander	£345
MIDI Expander	£399
DK600	£775
MK900	£359
PIANO Quatro	£735
OPERA 6	£599
CRUISE	£399

ALL PRICE INCLUDE VAT & FREE SECURICOR DELIVERY (UK MAINLAND ONLY)

CHECKLIST enters its second phase, as we present a thorough rundown of the dedicated sequencers, computer music systems, and software packages currently available in the UK.

The listing follows the same format as last month's polysynth guide. A make-by-make rundown of each individual product and its typical retail price, accompanied by shortform specification details and the comments – for, against, and summing-up – of E&MM's own reviewing team; guaranteed to raise the wrath of the music industry and keep Britain's music-playing population better informed than ever.

But whereas the polysynth CHECKLIST was a piece of cake to compile, product-wise, this month's version has caused our researchers a somewhat bigger collective headache. The reason is simple. By its very nature, computer software is continuously updatable and presents product developers with an essentially open-ended means of working. As a result, the range of available music programs changes more rapidly than that of any other musical instrument sector. And no matter how hard we try, there are bound to be some software packages – particularly those from smaller, less well-known sources – that slip through this month's CHECKLIST net.

To ease the burden a little, we've omitted the lower-end programs aimed at exploiting the internal sound chips of popular home micros, even if they offer MIDI as a selectable option. There's also no space for packages which, while of obvious technological and musical interest, aren't readily available outside their native Japan, Germany, US or wherever.

That aside, you should find the listing to be a valuable source of technical data on today's 'music production' packages, with the added bonus(!) of E&MM's considered opinion thrown in for good measure.

Choosing gear has never been easier.

SEQUENCER Checklist

OBERHEIM

DSX – £1195 16-channel (eight CV/Gate outs) digital sequencer; 6000-note, ten-sequence, ten polyphonic track capacity; patch change, split and double control parameter information; cassette storage, internal or external sync options. + *Part of comprehensive Oberheim system comprising excellent DMX/DX digital drum machines and OB8 poly, does its job smoothly and efficiently;* – *not MIDI-compatible;* – *obvious choice for Oberheim system owners, that's been subject of recent price reduction, but will disappear without trace unless MIDI is fitted – fast.*

ROLAND

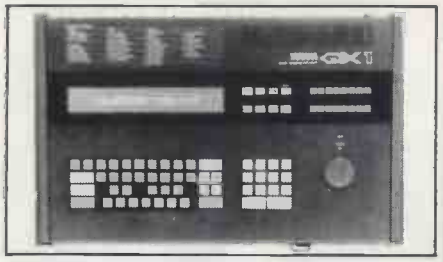
MC202 – £160 Two-channel digital CV/Gate monophonic sequencer; real or step-time recording options, approx 2600 note capacity; tape storage, portamento and accent facilities, internal or external (24ppqn) sync options, battery or transformer operation. + *Built-in sound-generating synth module, second sequence channel, very low price;* – *no MIDI facilities, synth section sounds nothing special and incorporates no patch memories;* – *excellent introduction to sequencing sadly approaching the end of its useful working life, but still difficult to ignore if money is tight.*

MSQ100 – £525 Single-track, 6100-event polyphonic sequencer; step- and real-time recording options, velocity parameter information, cassette storage, internal or external sync (24ppqn) option. + *16 channels of MIDI recording, cost, power-down memory retention;* – *multifunction controls make many options difficult to access, no overdub editing facilities;* – *versatile, cost-effective machine outperformed by Yamaha QX7, but probably a better bet for existing Roland sequence users.*

MSQ700 – £850 Eight-track digital MIDI and DCB sequencer; real- or step-time recording options, 6500-event capacity, voice, envelope and filter parameter information; tape storage, MIDI In and Out. + *Ease of operation, DCB connection means JP8 and Juno 6/60 owners can use their synths in MIDI systems;* – *no MIDI Thru and only one MIDI Out, high cost for what's inside the machine;* – *lone occupier of curiously empty sequencing middle-ground, thus will probably continue selling well for some time to come.*

YAMAHA

QX1 – £2299 Eight-track digital MIDI sequencer, real-time recording with extensive step-time editing facilities, 32 songs, 999 measures, pitchbend, modulation, key velocity, aftertouch control parameter information; approx 80,000 note capacity, disk storage, MIDI In, Thru, eight MIDI Outs. + *Unrivalled (for a dedicated machine) editing and MIDI track assignment options, tailor-made for Yamaha's own superlative TX816 sound rack;* – *inadequate display, silly keyboard, costs a lot for a jazzed-up eight-bit micro;* – *has spent a year at the top of the dedicated sequencer tree and deservedly so –*



contemporary technology's version of the MicroComposer, but polyphonic and a lot more flexible.

QX7 – £499 Two-track digital MIDI sequencer, step- or real-time recording options; key velocity, aftertouch, pitchbend, modulation, foot control, breath control parameter information; cassette storage, internal and external MIDI syncing options, MIDI In, Out, Thru. + *Ease of use (considering multiplicity of job commands and functions), track assignment flexibility, cost;* – *only one MIDI Out;* – *well thought-out machine that offers versatility of computer software in a more musically-accessible package, 16-channel MIDI recording affords more potential than two-track format would indicate, unbeatable for the money.*

SOFTWARE Checklist

EMR

BBC MIDI Hardware Interface – £90 MIDI In, two MIDI Outs, sync (24 ppqn) connections. **MIDItrack Composer – £50** Disk-based, step-time sequencing package for BBC B. + *Reasonably comprehensive range of editing facilities;* – *like a lot of early step-time packages, too laborious to make using it enjoyable or even tolerable;* – *designed for computer buffs rather than musicians, if you're one of the latter, you'll be disappointed.*

Performer – £80 Eight-track, disk-based, real-time sequencing package for BBC B; **Graphics – £37** Graphics-generation package for BBC B, responds to input of MIDI music information; **Notator – £40** Forthcoming disk-based link package for Composer, permits hard copy of music; **BBC Editor – £40** Forthcoming disk-

based link program for Composer and Performer, allowing both real-time and step-time input. *All above EMR BBC packages to be reviewed.*

CBM64 Hardware MIDI Interface – £90 MIDI In, two MIDI Outs, sync (24 ppqn) connectors.

Performer – £80 Eight-track, disk-based, real-time sequencing package for Commodore 64. *To be reviewed.*

Spectrum MIDI Interface – £90 MIDI In, two MIDI Outs, sync (24 ppqn) connectors.

MIDItrack Performer – £80 Eight-track, cassette-based, real-time sequencing package for Spectrum. + *Easy to use, above average use of Spectrum's limited graphics capabilities;* – *still a few editing idiosyncracies, won't work with any hardware other than EMR's own interface;* – *a definite and welcome improvement on EMR's earlier BBC package, let's hope they keep it up.*

HINTON

MIDIC 1.0 – £250 (2K), £300 (10K) Intelligent interface between MIDI and RS232 computer-standard connection. Includes utility program that allows incoming MIDI data to be viewed on-screen and assists users wishing to write their own MIDI software. *To be reviewed.*

JELLINGHAUS

Commodore 64 MIDI Hardware Interface – £90 MIDI In, MIDI Thru, three MIDI Outs, external Clock In; made for Jellinghaus Music Systems by Siel in Italy.

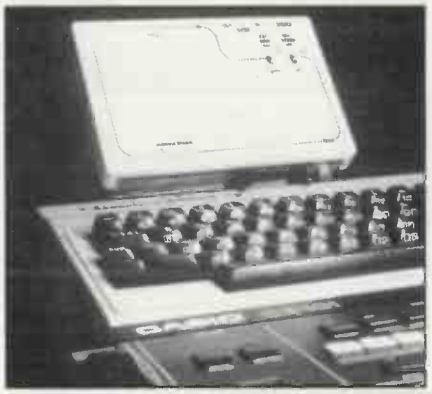
12-Track Recording Studio – £100 12-track, 7677 event, disk-based real-time sequencer for CBM64; velocity, pitchbend, after-touch and program change parameter information, internal or external sync options. + *potentially easy to use, plenty of channel assignment options;* – terrible manual hinders rapid acclimatisation, both hardware and software have their idiosyncracies; – *flexible system from a company that knows what it's doing in the programming department, even if the hardware sometimes lags behind a little.*

Sequence Chain Program – £TBA Add-on for 12-track Recording Studio, acts as link between sequences of various tempi and time signatures, allows storage of patch changes. *To be reviewed.*

SixTrak Sound Editor – £TBA Commodore-based patch-editing program for SixTrak and MAX polys. *To be reviewed. Also up and coming from JMS: Scorewriter, DX Sound Editor, RX Data Library, Arpeggiator and 'Drum Humaniser' software packages.*

JORETH

Music Composer System – £250 Eight-track,



disk-based, real-time and step-time sequencer for CBM64, sold complete with hardware interface; 6000-note capacity, MIDI In, three MIDI Outs, internal or external sync options. + *Excellent low-level Music Composition Language, syncable to non-MIDI clock (selectable timebase), easy to use considering complexity;* – *relatively high asking price;* – *the premier MIDI software package for CBM64 users, so far produced in small numbers by Worcestershire company particularly responsive to musician's – rather than programmer's – requirements and suggestions.*

LEMI

Apple MIDI Card – £TBA MIDI In, three MIDI Outs, external Clock In, footswitch jack, for use with Apple home computer and Apple-compatible lookalikes.

Future Shock Software – £TBA Disk-based eight-channel, real-time sequencer package, 2900-note capacity. + *Easy to use thanks to single-keystroke commands and handy Help page, decent editing facilities;* – *tricky to get hold of in the UK, Apple isn't exactly world's best-value home micro;* – *well thought-out and eminently usable real-time sequencing package, and good value in its native Italy.*

AMP 83 Software – £TBA US-originating collection of Apple-based MIDI programs, including step- and real-time sequencer (16 channels, 4000-note capacity), and delay program that introduces time delay between MIDI Receive and Transmit signals.

PASSPORT DESIGNS

Apple MIDI Card – £220 MIDI In, MIDI Out,

Drum Sync In/Out (24, 48 or 96 ppqn), plugs into expansion slots on Apple motherboard.
MIDI/4 Software – £110 Disk-based four-channel, real-time sequencer, 5500-note capacity. + *Extensive overdubbing facilities let you merge four tracks of data onto one, external sync compatibility;* − *software-writing lacks imagination, decidedly pricey over here;* − *OK, but Passport are capable of a lot better. Revised MIDI/4+ and MIDI/8 packages (for both Apple and Commodore 64) coming soon.*

ROLAND

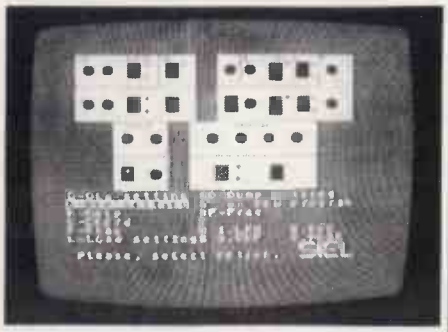
MPU401 Hardware Interface – £160 'Intelligent' interface for Apple and IBM PC; MIDI In, two MIDI Outs, Sync Out, Tape In/Out connectors; additional computer bus allows four MPUs to be connected in parallel.
Microware Software – £TBA 48-channel MIDI sequencer for IBM PC and Roland MPU401. *To be reviewed.*

SEQUENTIAL

900 – £35 'DumpTraks' software facilitates program and sequence dumping to CBM64 disk from any Sequential polysynth equipped with MIDI; **910 – £75** Disk-based CBM64 expansion for SixTrak poly, allowing up to two keyboard splits and assignment of voices, display and alteration of voice parameters using pitch and mod wheels and memory for storing and editing sequences; **920 – £75** Similar to above for MAX polysynth, capabilities include 'superpatch' stacks, keyboard split and voice assignment, and voice creation and amendment using 64's QWERTY keyboard; **931 – £TBA** 4000-note capacity Recorder/Editor/Composer for SixTrak and MAX; **932 – £TBA** Printer for 931 Composer showing up to six voices on conventional stave format, tempo and transposition details; **933 – £TBA** 'Album Series' package facilitates performance of current musical favourites on SixTrak, MAX and Drumtraks digital drum machine, allows control over tempo, key and voice timbre; **964 – £75** Disk-based polyphonic MIDI sequencer for CBM64 with 4000-event capacity; velocity, pitchbend and mod parameter information, facilities for overdubbing, copying, correction. *All above Sequential programs to be reviewed.*

SIEL

Spectrum MIDI Hardware Interface – £79 Spec similar to JMS interface unit.
Spectrum Live Sequencer – £22 Cassette-based, single-track, polyphonic, real-time sequencer for Spectrum. *To be reviewed.*
CBM64 MIDI Hardware Interface – £79 Spec similar to JMS interface unit.
CBM64 Live Sequencer – £69 Disk- or cassette-based, 16-track polyphonic, real-time sequencer for CBM64; editing and transposition facilities, song memory. + *Remembers velocity and aftertouch data, fairly easy to use, who can argue with 16 recording channels at this money?;* − *needs more editing facilities, laborious playback routine;* = *almost, but not quite, the perfect* player's *software package.*
Expander Editor – £53 CBM64/Spectrum disk- or cassette-based graphic parameter control program for Siel Opera 6, DK600 and Expander 6. + *Excellent graphics program puts 'analogue' visual on computer monitor for rapid, straightforward patch editing;* − *nothing, except that*



forthcoming Expander 80 Editor will have even better graphics; = a real winner, shows Siel have programming ingenuity in abundance.
BBC/CBM64 Multitrack Composer – £39 (disk), £36 (cassette) Six-channel step-time sequencer, 9000 note capacity, QWERTY input of information. + *Highly versatile, masses of editing facilities for very little money;* − *can be a real pig to use;* = *should succeed among composers rather than musicians, but still too many keystrokes per note for our liking.*
MIDI Database – £39 CBM/Spectrum disk- or cassette-based synth program file, stores 250 patches for any MIDI synth except Yamaha DXs. *To be reviewed.*
Digital Echo/Delay – £54 CBM64 disk- or cassette-based digital delay program, works by inserting delay between MIDI Receive and Transmit signals; 5mS-200mS delay, control of signal/effect balance, 14 'heads', auto-loop, MIDI-assignable file sequence. *To be reviewed.*
Keyboard Tracking Program – £75 CBM64 disk- or cassette-based program facilitates assignation of master keyboard with splits, arpeggiation, sequencing to control any MIDI source. *To be reviewed.*

CHECKLIST

Expander 80 Editor – £55 Forthcoming CBM/Spectrum disk- or cassette-based Editor for DK80 and Expander 80 polysynths, gives full control over user-adjustable parameters by joystick or QWERTY keyboard, complete with real-time waveform shaping, Help pages. *To be reviewed.*

DX7 Editor – £TBA Voice Editor and patch memory for Yamaha DX7. *To be reviewed.*

SOUND DESIGN

DX7 Editor – £25 Cassette-based DX7 voice editor program for Sinclair Spectrum, works with most major Spectrum MIDI Interfaces; allows libraries of voices to be built up on cassette. + *Excellent and easy-to-use (if rather derivative) graphics, even more remarkable given humble Spectrum origins;* – *nothing unless Yamaha are planning to sue for graphics plagiarism;* – *another patch-editing winner, all the more useful in the context of DX7's unhelpful LCD window, saves Spectrum owners the cost of CX5M and appropriate software.*

UMI

UMI 1B – £495 British-built all-in-one MIDI sequencing package for BBC B, comprising Aries RAM expansion board, ROM-based step- and real-time sequencing software with extensive editing and song-chaining facilities, DX7 voice editor. + *Sequencer beautifully easy to use in either entry mode, compaction facilities allow removal of memory-intensive dynamic and mod wheel data, informative and helpful graphics layout;* – *only the cost;* – *superbly conceived and well laid-out sequencer package that does everything all the others do and more. But UMI 2B is already here...*

XRI SYSTEMS

Micon MIDI System Controller – £108 Eight-track (mono) real- and step-time sequencer for 48K Spectrum; 10-sequence, 24,000-event capacity; comes complete with hardware interface incorporating MIDI In, two MIDI Outs, internal or external sync options. + *Sync to non-MIDI clock (selectable timebase); excellent step-time editing facilities, very creditable music notation display, open-ended structure offers scope for user-programming;* – *poor real-time facilities;* – *again, British programming cleverness beats inadequacies of host micro to produce a really usable and versatile package, too good to ignore unless real-time editing is top of your list of priorities.*

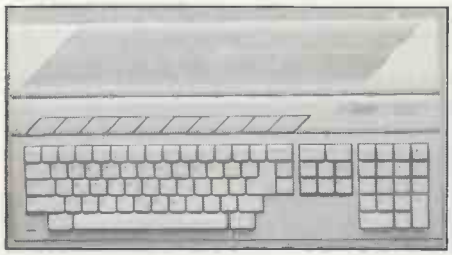
COMPUTER *Checklist*

AKAI

CPZ1000 Music Computer – £TBA MIDI music computer incorporating twin 3.5" disk drive in 19" rack-mounting format. Specifications as yet undisclosed, but options will include RZ1000 recorder panel, EZ1000 editing module, and MZ1000 CRT display unit. *To be reviewed.*

ATARI

520ST Home Computer – £700 New 68000-based home micro with 512K RAM and disk drive included in price. Built-in MIDI In and Out sockets, polyphonic MIDI sequencing software



expected in either ROM or disk form when computer becomes available during summer. *To be reviewed.*

E-MU SYSTEMS

Emulator II – £7250 Eight-voice, eight-bit sampling system, five-octave velocity-sensitive keyboard, split and layering facilities, analogue filtering and LFO, disk storage. + *Superlative sound quality, maximum 17-second sample length, onboard sequencer, MIDI compatibility,*

ease of use in all areas, especially looping; ➖ *long loading times, poor keyboard;* ➖ *great improvement on original Emulator, and one of the easiest and most cost-effective routes into high-quality sound-sampling.*

ENSONIQ

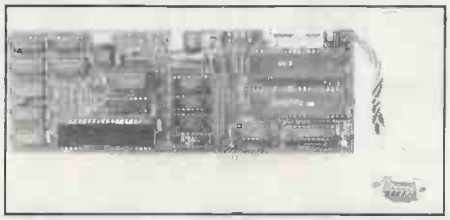
Mirage – £1695 Eight-note polyphonic sound-sampling keyboard; built-in 3.5" disk drive, sequencer and analogue sound-modifying section, five-octave touch-sensitive keyboard with split options, full MIDI compatibility. *To be reviewed – available in UK June/July.*

FAIRLIGHT

CMI – from £28,500 + VAT Eight-voice, eight-bit digital synthesis and sampling, built-in dual disk drive, six-octave music and QWERTY keyboards; wide range of sound creation and music production software packages. ➕ *Designed as a total computer music system from the outset, and it shows;* ➖ *comparatively poor sampling quality, soon to be replaced by 16-bit Series III;* ➖ *an industry standard, though showing signs of being left behind by cheaper, newer technology, Series III could change all that.*

GREENGATE

DS3 – £250 Four-voice, eight-bit, disk-based digital sound-sampler for Apple II/IIe; optional (£200) five-octave keyboard, onboard real-time sequencer. ➕ *Sounds surprisingly good for cost;* ➖ *not very easy to use, poor interfacing;* ➖ *still one of the cheapest ways of getting into polyphonic sampling, if you have an Apple...*



KURZWEIL

250 – £10,995-£18,035 Twelve-voice, disk-based sampling system; 88-note velocity-sensitive weighted keyboard, split facility. ➕ *Excellent sound quality thanks to unique 'Contoured Sound Modelling' system, comprehensive interfacing, onboard sequencer and chorus, 12-channel outputs;* ➖ *user-sampling requires (expensive) addition of Apple Macintosh computer;* ➖ *after all the pre-release hype, the Kurzweil delivers the goods: but elements of its design could be a lot more cost-effective.*

NED

Synclavier – £100,000-£200,000+ Eight- to 32-voice, 16-bit FM digital synthesis and sampling system; 76-note, individually pressure-sensitive, weighted keyboard, 32-track onboard sequencer, internal or external sync options, SMPTE syncing facilities. ➕ *Vast range of software updates and options, future ones include fully polyphonic sampling;* ➖ *outrageously expensive, Yamaha's DX exploits have made FM synth section look very silly;* ➖ *an excellent system for studios, musicians and composers with more money than they know what to do with.*

PPG

Wave 2.3 & Waveterm – £3,995 & £4590 Eight-voice, eight-bit, additive synthesis and disk-based sampling system; five-octave velocity- and pressure-sensitive keyboard, onboard sequencer software. ➕ *Versatility of analogue/digital hybrid synth system, relatively cost-effective;* ➖ *Waveterm's limited keyboard and eight-bit sampling quality, suspect build consistency;* ➖ *a highly versatile and justifiably popular studio system, upgradable with Expansion Voice Unit and weighted Processor Keyboard: 16-bit sampling still to come.*

YAMAHA

CX5M Music Computer – £449; MSX software cartridges – £36; YK10 full-sized keyboard – £165 32K MSX micro with onboard eight-voice FM digital sound chip of similar spec to that in DX9 poly. ➕ *Excellent sound capability thanks to Yamaha's unbeatable FM system, superb voice editing and composing software packages;* ➖ *silly miniature keyboard supplied, MSX micro and FM sound chip add up to a lot less than the RRP;* ➖ *for the time being, the only serious contender in the cheap music micro stakes, with MIDI sequencing and RX drum machine editing programs arriving shortly.* ■

MUSIC

OUTTAKES

Out come the flags, banners and posters, as E&MM's new music review section takes to the air. *Tim Goodyer & Dan Goldstein*

VINYL TAKES

Part of the sleeve note reads 'For those people who know my records, I have included the titles which have obviously been raided. However, I am not revealing all my sources – I leave that for your detection.' And it's true. Most of **Peter Gabriel**'s new soundtrack album, *Birdy*, has already been released in one form or another, though that doesn't prevent it being an impressive record. Most of the plundered tracks have been heavily modified – as much by Eno engineer Dan Lanois as by Gabriel himself – so that, for instance, the vocal drama of 'Family Snapshot' becomes a brief Enoesque piano solo, and the despairing ballad of 'Wallflower' undergoes a similar transformation. But it's two of Gabriel's 'unrevealed' sources that offer *Birdy*'s finest moments. The marimba part of 'No Self Control' is backed by sweeping synth drones for the sparkling 'Slow Marimbas', while the vocal chant from 'Across the River' is contrasted with a new Jon Hassell trumpet part on the album's real stunner, 'Sketchpad with Trumpet and Voice'. In all, a delicious collection of cleverly crafted bits of aural landscape. If only all remixes were as flavoursome.

By contrast, the sleevenotes on **Richard Burmer**'s *Mosaic* are no more than directionless waffle, enough to put anybody off the record before they'd so much as removed the dust cover. Which is a shame, because Burmer's 'electronic vignettes' are quite something, a varied and tasteful gathering of 11 electronic instrumentals that are unobtrusive without ever becoming ineffectual. Overall standard is commendably high (none of the tracks is unlistenable), but all the real stars are on the second side. The gentle tuned percussion arrangement of 'Ave Pladaelio', the spartan but successful electronics of 'Lamento di Tristan' (the original was written by an unknown 14th Century Italian composer), and the Gymnopedie-like 'Ela-A', which closes the album in an ethereal wash of Emulator/ Mellotron choir and white-noise sea effects. *Mosaic* is yet another wonder from the catalogue of Californian label Fortuna Records, which means it's beautifully packaged and produced, but diabolically expensive (£8.99) from the company's UK distributor,

Lotus Records, 4/5 Piccadilly Arcade, Hanley, Stoke on Trent, Staffs. Worth every penny, though.

There aren't many successful bands who manage to maintain a chart presence almost all the time, but **Depeche Mode** are just such an act. They rarely spend longer than 12 months on an album, and in the time between long-players, they still succeed in coming up with a couple of 45rpm releases to keep the mouths watering. Their latest single offering, 'Shake the Disease', won't whet too many appetites at first hearing, but it's a cleverly and competently structured pop ditty that grows on you with time. In typical Depeche style, its music comprises a well-balanced set of interweaving melody lines played on a variety of electronic instruments, while its lyrics (just for a change) are well considered and delivered with some feeling. It might not have the catchiness currently required of Top Five material, but it's confirmation that the Basildon bond is getting stronger all the time...

There's more to ZTT than Frankie and The Art of Noise. German foursome **Propaganda**, from whom nothing had been heard for some while, have just released a rather clever piece called 'Duel'. Best described as electropop with feeling, much of the credit for the record's success probably goes to producer Steve Lipson, even if the song's 12-inch mix is about as imaginative as a fortnight in Marbella.

Production is also the key element behind **Anne Pigalle**'s 'Hé Stranger', though she'd probably never admit it. Pigalle is a newcomer to the Morley/Horn conglomerate, but although she possesses a silky Paris night-club singing voice and 'Hé Stranger' is far from being a worthless composition, the real heroes are producer Luis Jardim and pianist Nick Plytas, for steering an otherwise wayward ship into a harbour that suits it down to the ground.

Well, here it is, the new album from Emerson's old rival **Rick Wakeman**. The good news is that it's not as bad as the sleeve would have you believe – but don't hold your breath if you aren't already a fan. Including such old favourites as guitarist Rick Fenn (of 10cc fame), bassist Chas Cronk (from the *Six Wives* days) and long-term Wakeman drummer Tony Fernandez, *Silent Nights* is a highly predictable album that doesn't even enter the ring, let alone start pulling any punches. It's all here, from silly time signatures and sudden tempo changes, to the old Wakeman keyboard runs, now sounding somehow ungainly and unconvincing on the accredited Korg keyboards. Influences range from Wakeman's own works like 'Six Wives' and 'King Arthur', to Phil Collins' 'In the Air Tonight' (on the title track, this). Also predictably present is a good helping of the traditional Wakeman humour, at its most obvious on the vocal part of 'The Dancer'. At least it keeps you awake...

If you listen to pop radio *at all*, you can't have escaped **Loose Ends**' excellent slow-funk single 'Hangin' On a String'. Now, what normally happens is that funk albums rarely

live up to the standard of the singles that are taken from them but Ends' *So Where Are You?* is every bit as good as its 45rpm excerpt. The TR808 rhythm machine that made the single so instantly distinctive scarcely gets the chance to dominate the album's songs as its forwardness on 'Hangin' On a String' may have lead you to fear. Instead, the LP is a series of above-average soul tracks abounding in carefully-mounted layers of sound, spacious arrangements, and crystal-clear production courtesy of Nick Martinelli. There's a handful of real winners, but Goodyer's favourite is 'If My Lovin' Makes You Hot', home of some *marvellous* sax work (at the hands of Sam Peake) that should earn it at least some consideration as another possible single.

Although recent gigging work has incorporated a small but indubitably *live* band to add spice to all the technology, **Howard Jones**' new long-player *Dream into Action* retains the original *Human's Lib* recording formula. Only the TKO Horns and a little female vocal backing from Afrodiziak provide variety. Produced faultlessly by Rupert Hine, this is Howard Jones on top pop form, though that may or may not be such a good thing. There's nothing really striking about the album other than its predictability. 'Things Can Only Get Better' and 'Look Mama' represent the obvious single content, while 'No One Is To Blame' and 'Elegy' are the slower numbers thrown in to add 'atmosphere'; I imagine 'No One' should be a live goodie with our Howard going solo on Yamaha electric grand. It's good pop, but musically it's as uninspired as it's uninspiring. If someone ran a Stanley knife down the side of Howard's car, maybe he'd be galvanised into Action of a more positive kind. Until then, those horns are nice.

A lot of attention being devoted to sleeves this month. That of **Prince**'s *Around The World in a Day* is presented in similar psychedelic style to his last offering, *Purple Rain*. The fact that the lyrics printed on this one are more discernible, however, doesn't make them any more understandable. Sadly, there's not much of any startling musical interest on this one, and the production genius that once breathed an aura of *class* over everything Prince committed to vinyl has also gone AWOL. But there are two tracks that are at least fun. 'America' is a solid piece of funk that augurs well for future chart success, and just when you thought Prince had forgotten that he's really Jimi Hendrix reincarnated, along comes the closer 'Temptation' to reaffirm his – and our – delusion. Not content with this, the song degenerates into a musical wasteland before re-emerging for The Guarded One to conclude that '...love is more important than sex', after which he announces his departure and his uncertainty concerning his return. With any luck, the uncertainty will be justified...

Back to the singles, then. Fresh from a prestigious support spot on tour with Frankie come **The Promise**. While not exactly a worldbeater, their latest offering, 'Glasshouse', is a lively single containing some powerful electric guitar contrasted by a little tasteful acoustic work and a splendidly-addictive chorus. Pity the verse is such a weak one. All the essential hit ingredients are here, but for the time being, they're searching for a song that's well-structured enough to make the cooking worthwhile.

The **Pointer Sisters** are in a more fortunate position, of course, having already served up a successful menu of hit singles. Rich with percussion and gutsy synth overdubs – not to mention a healthy helping of *those* vocals – the girls' 'Baby Come And Get It' comes from the same corner as its predecessors 'Automatic' and 'Jump'. Co-written by James Ingram, can it fail to be a hit? Perhaps so, as the individuality that made 'Automatic' so irresistible is conspicuous by its absence. By no means short of dancefloor appeal or technical merit, 'Baby Come And Get It' is sales-assured, but not necessarily chart-assured. In spite of that, a thoroughly enjoyable single. Recommended.

TAPE TAKES

It doesn't matter how many new discs the record companies release, there'll always be 1001 more bands desperately trying to get signed up and into the nation's singles charts. Which is why E&MM's postbag is often brimming with cassette boxes from hopefuls young and old, all hoping to see their act's name in print and all, seemingly, crying out for a second opinion on the music they're producing.

Well, here goes. Best of the tape bunch this month are probably the **Reactors**, a London

two-piece comprising David Ellis(!), who handles Roland guitar synth and takes the production and Drumulator programming credits, and Boo, who contributes vocals, keyboards and bass guitar. The demo contains five songs of which the strongest, 'Walking Wounded', is the most professionally recorded. Like the remaining four offerings, it's a strongly melodic ballad reminiscent of, if anything, latter-day Fleetwood Mac. It's got a catchy chorus, tasty backing vocals and a guitar synth solo that takes the extraordinary step of using the odd chord, yet in spite of all that, 'Walking Wounded' is just a little too slowly-paced to be a complete success. All the Reactors need now is a suitably up-beat centrepiece, and the road to superstardom will (probably) be theirs for the taking.

A Touch Closer are four more lads making their bid for mass chart recognition, and in the process running away with the 'Duran of the Month' title. Not content with accompanying their demo with a copy of a (bad) *One Two Testing* review, the boys offer a whole wadge of formularised pop at its least inspiring. It's all here, from Tony Hadley/Simon Le Bon vocals to JT bass lines – and they claim the common desire to 'make brilliant music'! It's a shame so much enthusiasm is wasted on reproducing the contents of last week's *Top of the Pops*. Switch the television off, and the creativity back on.

You know, there's a temptation to think you can overcome a drum machine's shortcomings by giving it 'human feel' in the shape of a whole load of meandering fill-ins. Judging from his demo, that's exactly what Leeds' **Marvin Wilson** has done with his TR606. That aside, the tape has plenty of commendably intricate sequence work, well thought-out and more than adequately documented on an Aria R504 four-track. The overdubs vary from pleasant, solid chord work to melody lines that are just a little on the twee side. Best of all is 'On the Road to Atlantis', a piece of slower-than-average tempo on which the Drumatix is relatively unobtrusive, though like Wilson's other song titles, this one bears precious little relation to the piece of music it's appended to. Odd, that.

Masque have submitted a tape of four songs, all taken from an album finished earlier this year and digitally mastered on Sony PCM F1/701 hardware. Recording and production are clean and clear, allowing the finer qualities of Yamaha DX7 and Greengate DS3 to shine through nicely. And so to the music. It's not an insult to say that a lot of it falls into the Genesis/Gentle Giant category; time signatures change at will and guitar solos abound under titles such as 'Innocent Bystander'. Some of Masque's music was written for forthcoming film work, but songs that lack the visuals intended to accompany them have to be *very* good to succeed in the normal run of things. Not the sort of thing I'd put on a demo, really.

Thanks to the home recording revolution, getting decent sound quality is no longer a matter of spending thousands on commercial studio time, and that's meant an overall increase in the quality of readers' demo recordings. Which puts Birmingham's **Split Decision** in the unenviable position of contributing this month's *worst* quality sound recording. This is even sillier when you consider the band claim to be about to turn a couple of their songs into a single. Only two of their four tracks are blessed with titles – not a good move in the field of selling records, this. Still, it's the untitled songs that raise the tape's standard above the drably tedious. Some clever bass-work and synth chords make the last track, in particular, really listenable. So, drop the first two tracks, use the last as the single and the remaining untitled number as the flip-side, and you should be away, guys. Oh, one last point. Stop trying to sound like Limahl – it does strange things to your hair. ■

THE BODDY [redacted] IN QUESTION

Of all Britain's new-generation synth composers, few are more consistently active or enthusiastic than Tynesider Ian Boddy. This month he's released a second album of electronic music under his own steam, and further projects are in the pipeline. *Tim Goodyer*

I suppose Ian Boddy's name will already be familiar to many of you thanks to his periodic contributions to E&MM's editorial pages. From time to time, he's put the case for spreading the word of instrumental electronic music to a wider audience through the release of records and cassettes and the staging of live concerts, and he himself has been active in both those fields. He performs live more frequently than almost any comparable musician in the land, and as from this month, he has two self-perpetrated album releases to his credit.

Boddy took the plunge, vinyl-wise, in the autumn of 1983, when he released a sparkling long-player by the name of *The Climb*. It sold well, and its successor, *Spirits*, looks like doing better still, so why such a delay between the two albums? It seems the main problem was one familiar to everybody – money. As the company financially responsible for the release of *The Climb* weren't able to fund its follow-up past the master recording stage, the composer had to look around for an alternative deal.

'I'd been talking to Jive Electro but it was taking so long. It took 18 to 20 months to get *Spirits* out, and that was really frustrating. I had all the material finished at the start of last year, but couldn't do anything with it.'

Eventually, Boddy managed to secure a welcome if not exactly substantial grant from the Arts Council, finished the mixing, and had the disc pressed and distributed on his own.

'The Arts Council gave me £1100 for a year, and that was my last chance before self-finance. The arrangement is that I get to keep the royalties, and any profit we split in half.'

And profit does seem to be a serious possibility, now that 800 copies out of an original pressing of 1000 have been sold or ordered within a month of the LP's release. One hundred of that original figure were given away in the interests of promotion, while 500 went straight to distributors. 'I'm hoping to have the £1100 back by the end of June', predicts Ian. If he's right, a re-pressing won't be all that far away, and it'll be no more than he deserves. The success he's achieved so far has been the result of sheer hard graft, trying to get as much publicity through as many different media as has been practically possible.

'I've already had quite a bit of local radio interest and done two interviews. Of the tracks on *Spirits*, 'Pulse' and 'Living in a Ritual' have received the most airplay, though someone did actually play seven minutes or so of the title-track – not bad when you consider the full version lasts for one whole side of the album.'

And Boddy's distribution covers overseas markets in addition to the British one, which is no bad thing for a musician in his particular field. 'There seems to be much less interest in the UK market than that in Germany, for instance, but I don't really see why that should be. There are disadvantages with foreign distribution, like the language barrier and the time it takes to get stuff available there.'

Recording

Back to the music. All recording and production was carried out at Newcastle Media Workshops, where Ian exploited an enviable arrangement whereby he had unlimited free studio time in return for doing a little engineering work for the organisation. Just what went on in the studio is a bit of a mystery, though, due largely to the absence of an equipment listing on the record sleeve. It turns out this is a deliberate move on the part of the artist. Why?

'Well, first of all I felt it would all look a bit odd because my equipment list would have been so long in comparison to the other two musicians on the album. But it was mostly because I don't really like the way the industry tries to put so much pressure on the artist to have the most up-to-date equipment, and the way it fails to make it compatible with older stuff. The way things are now, you really need to have *all* the new equipment to make it work together. And that's not something I'm all that keen on doing, not least because of cost.'

Point taken. The hardware on the album turns out to be as varied as the above sentiments would suggest. First on the list is a Yamaha DX7, in itself nothing startling save the fact that Ian claims to be one of the first in the UK to own one. What is rather more surprising is the fact that the DX finds itself surrounded by a number of strange bedfellows on *Spirits*, none stranger than an ancient VCS3 analogue synth...

'After working with the VCS3 as an introduction to synthesis, and also the Roland System 100M which has limited FM synthesis, I found the DX7 quite easy to program', comments Boddy. Lucky man!

'I also used the Roland in conjunction with the other synths quite a lot. For example, the sequence in the middle of *Spirits* was the DX7 'cut' by the 100M, which I found quite effective. I used a Roland TB303 Bassline, too, but only to trigger the System 100M – not for its own sound!'

'There's a Roland SH2 on there as well, which I used for bass drones. I still don't feel there's anything to beat the richness its three oscillators can give.'

From the subject of synthesisers to that of something altogether less futuristic – drums. Another Ian (McCormack, a local heavy metal skin-basher, would ya believe) is credited with acoustic drums on the record sleeve, and it's an addition that seems unlikely at first. It works,

though. *Spirits* is a good bit more dynamic than its predecessor as a result of the drummer's inclusion, or as Boddy put it, 'he certainly livens things up a bit.'

But that's not to say the composer has neglected electronically-created percussion – far from it. Where his use of drum machines differs from most people's lies in his insistence on using the best sound he can find for each drum, and that results in a bizarre and unwieldy collection of drum machine sources, as Boddy explains.

'First of all, the hi-hat is from a Roland TR606. I actually prefer the sound of an analogue hi-hat to the sound of a real or digitally-encoded one. In fact, the hi-hat of the acoustic kit on *Spirits* is EQ'd to sound as much like the 606 as possible!

'The bass drum is the TR808, and the snare is from the Hammond DPM48 – that's the only electronic snare I really like. The drum machines were all synced together using the five-pin DIN sockets that are standard on all of them, which was useful.'

In addition to all this, Boddy has called his DX7 into action for some percussion sounds. 'I really like the drum sounds you can get on the DX. On both 'The Sentinel' and 'Living in a Ritual' I used a modified Log Drum off the DX7 cartridge. There's no MIDI sequencing or arpeggiation on the album, so the drum roll on 'The Sentinel', for example, was played by hand. That's good because it means you can put extra touches and dynamics in, things you couldn't readily sequence. It adds a human feel to things, and it's much more satisfying to do.'

Another characteristic of the way *Spirits* is arranged is Boddy's *penchant* for mixing sequenced and manually-played parts.

'In the middle of *Spirits* I've got a static sequence and real drums running together, because I like the contrast between the two. Quite a lot of what *sound* like electronic sequences on the album are actually played by hand.'

External Hardware

But lest you be under the impression that Ian Boddy's musical instrument resources are unlimited, I should point out that not all the hardware used to record the album was his own. And in amongst the list of borrowed gear (much to Boddy's regret) is a Roland SVC350 Vocoder that saw extensive use during the creation of *Spirits*.

'The vocoder is the same one I used on *The Climb*. I've used it this time on 'Ritual' for a solo that has the DX7 articulated by the vocoder, and on 'The Sentinel' for choir effects. The finished sound is usually more synth than voice, but I like the almost guitar-like fluidity that the vocoder gives the sound. It's much better than the breath controllers I've tried – more subtle and human in quality. Another thing I did with it was 'spooky' sound effects – I got some white noise and muttered over it!

'Initially *all* the vocals on the album were done with the vocoder, but I felt they were still too weak, and that's where Brian Ross came in. He's a heavy metal singer, and the reason I asked him to sing on 'Living in a Ritual' was because I don't like the current style of pop vocal – I wanted something stronger. The vocoder is still there at the end of the track in the background, though, filling in the chords behind the lead vocal.'

The recording was eight-track, recorded on a Tascam 38-8, and digitally mastered on a Sony PCM F1, another piece of technology Boddy is particularly impressed with.

'There isn't any comparison between digital mastering and reel-to-reel mastering. There's no detectable hiss, which is especially useful on fades, but one problem is that it's very difficult to edit digital master. Originally we had gaps of maybe 16 or 17 seconds between the tracks on side one, and had to cut them down to eight or nine seconds by doubling the speed of the master between tracks at the cutting stage – that was at Utopia studios.'

Still on the subject of things digital, Boddy has his own set of opinions when it comes to bit-sized outboard gear, too. In this case, they're less favourable.

'I found I preferred the tape echo over digital echo for lead sounds and washes, as the Roland SDE2000 at the studio was just too clean; so I used the Roland on sequences instead. I did like the digital reverb, though. It was the first time I'd used one, and both the Yamaha R1000 and the MXR Ø1 are really good – much better than the old spring reverb. And that's good for me, because I feel that reverb really is the most important overall effect.'

Live Work

Changes are also in the offing for the live aspects of Boddy's work, as his activities over the coming months should show. Because whereas most of his past ▷

performances have been solo affairs, future gigs should see him aided by the recruitment of additional keyboard player David Berkley.

'David is a local keyboard player that I've known for some time. We work at the same place and only live about two-and-a-half miles apart, so it's quite a convenient arrangement.'

It seems the intention, initially at least,

> 'I used a heavy metal singer on the album because I don't like the current style of pop vocal – I wanted something a lot stronger.'

is for the duo to perform Boddy's work only, with Berkley relieving the composer of some of the live performance pressures.

'David will be using a DX7 and a Prophet 600 MIDI'd together, which will enable us to emulate the sound of the album fairly closely. Until now, performing live has been a job for both my hands and both my feet, but having David around should make things a lot easier and allow me more freedom to concentrate on the visual presentation. I've used tapes in the past for rhythms and effects, but they have their drawbacks.

'I have actually performed *Spirits* live about four times already, each time a little differently, and it actually works better with taped drums than a drum machine. Mind you, if Ian McCormack is available I'd like to perform it completely live sometime in the future.'

Ian reckons it'll take a few gigs before the relationship between himself and Berkley is properly established, but has high hopes for the project, and intends to introduce some new material into the duo's second performance. Thus far there are around five possible gigs in the offing, though only two of these were confirmed at the time of writing. The first will be in June at a festival called 'Man and Machine' in Stockton, for which a 45-minute spot featuring 'Spirits' and 'The Sentinel' is planned, while the second is to be either an evening support or daytime headline spot at UK Electronica '85. Once the format of the performances has been established, there are promises of the inclusion of such eccentricities as African drums, though finance remains an important consideration, so that no definite visual plans, for instance, have taken shape on the Boddy drawing board. We shall see.

But one thing that will remain regardless of the man's financial situation is his determination to get synth music accepted by as wide an audience as possible.

'I'm very determined to get people away from this preconception that synthesisers are machines. A synthesiser is no more or less machine than a grand piano, after all, and there's a lot more electronic music about than people seem to realise. Today's chart music, for example, is extensively electronic, but not many people actually realise that the music they're listening to is made up using electronic instruments.'

Another of Ian's concerns is the general (and prevailing) feeling among the general public that the standard of UK electronic music somehow falls below that being produced in mainland Europe.

'The only people around in the UK at the moment are Mark Shreeve and myself, and we seem to be seen as being musically inferior to Tangerine Dream, Vangelis or Jean-Michel Jarre. I don't think that's the case at all, but it's very hard to gain acceptance. We're seen as not being as *professional* as them and, consequently, it's much harder to persuade a record company to take the risk they'd take with Jean-Michel Jarre with one of us. Maybe it's because of the vast amount of equipment they use, but I think our work is just as valid.'

Things to Come

Moving on from music biz politics towards Boddy's future plans, it seems that rather than continue to invest money in more and more equipment, he'll opt to record and sell the music he makes with what's available to him now.

The search for a recording contract will continue, but if nothing turns up, the money forthcoming from *Spirits* should help to get things underway. A short-term loan from Boddy's friendly local bank manager isn't out of the question, either. But however the financial side of the next album is eventually resolved, the artistic considerations are unlikely to be a problem.

'I've already managed to get some new material recorded on the four-track at home and one piece at the University studio, as the studio I used for *Spirits* is looking for new premises at the moment.

'At the time I recorded *The Climb* I felt I was happy with it, but I feel that I've progressed a long way with *Spirits* both in production and playing terms; and already, I think I can improve on that. I want to try to capture a wider range of moods and dynamics, and get the sort of energy that a rock band gets. I'd also like to combine differing styles such as church organs and rock drums.

'I think I achieved that integration to some extent with the title-track on *Spirits*, which is almost classical in feel whilst 'Pulse', for instance, is a lot more poppy.

'But if there's one thing I want to do most of all, it's to get people over the idea that there's something special or unusual about electronics, get them over the 'machine mystique' mentality, and back to listening to the music.'

I think we'd all drink to that. ■

For those interested, Spirits *is available from: Lotus Records, 2 Piccadilly Arcade, Hanley, Stoke on Trent, Staffs, or through general retail distribution by The Cartel.*

NOW AN INCREDIBLE EXPERIENCE IN SOUND CREATION...

THE AX80 SYNTHESISER

The AX80 is an 8-voice programmable polyphonic synthesiser which offers the unique combination of great sound, easy operation, and the best of today's music technology.

Just look at the features: stylish, well laid-out front panel; reliable touch-pad selection controls accessing 32 factory presets plus 64 user-defined sounds; single-touch editing; touch-sensitive keyboard; and fluorescent bargraph display of sound parameters. it all adds up to a synth which combines the familiarity of 'analogue' controls with digital precision.

And, of course, there's the MIDI interface, allowing you to link the AX80 into other modern music systems.

It's that special combination of versatility and ease of use that gives the AX80 and the whole AKAI Micro Studio System, the edge. If you're looking for a new creative experience, AKAI's got your sound.

For stockists see facing page.

AKAI

A new world of sound creation

The King's Keys

As Coventry's finest aggressive pop combo take the nation by storm, we aim the spotlight at the back of the King stage, and find a hard-working keyboardist of surprising skill. *Tim Goodyer*

First of all, Paul King loves him. Not in any passionate or affectionate sense, you understand, but as a musician whose contribution to King's success has so far been underestimated by almost everybody. Perhaps it's best if I leave the biography to King himself...

'The first time I ever saw him he was in a band called the MPs, supporting the Reluctant Stereotypes who I was with at the time. When the show finished and everyone was packing down, he got on a piano and started playing – it was then that I realised that he was a very talented keyboard player. From that day on I was on nodding terms with him, and then when I got King together I wanted a keyboard player who could be an anchor man; he also had to be a very versatile player, and Mick came through on all levels.

'First, he's an immensely talented keyboard player, without a doubt. As a character he's sensitive and modest, and he's very adaptable on a quick level – you can show him anything and he'll just do it. I think he *is* very much the anchor man within King. He has more musical knowledge than anyone else in the band, he's the most adept player, and he's proved very important to our overall sound.'

The man in question is Mick Roberts, currently playing keyboards with King both live and in the studio. The band are currently enjoying considerable chart success with hits such as 'Love and Pride' and 'Won't You Hold My Hand Now', and they're also attempting to make sure everyone and their mum sees their live show by playing *everywhere*. Twice.

But theirs is not an overnight success story, nor is it the tale of a studio band taking to the road for the first time. At a time when chart music is dominated by acts that exist in the studio first, on video second, and on stage a poor and irrelevant third, it's refreshing to see a band that takes a live performance and turns it into a record, rather than the other way round.

'He's an immensely talented keyboard player, without a doubt. As a character he's both sensitive and modest, and he's very adaptable on a quick level – you can show him anything and he'll just do it. I think he's very much the anchor man within King, and he has more musical knowledge than anyone else in the band. He's the most adept player, and he's proved crucially important to our overall sound.'

Paul King

Equipment

Roberts' current keyboard line-up consists of a PPG Wave 2.2 poly, a Roland VK1 organ and a Crumar S2 string synth. The last two are rusted with sweat from the continuous gigging they've received, and the keyboardist describes his set-up as 'medieval' rather than MIDIable. But why have a VK1 when there's a PPG to hand?

'Well, the PPG has some great organ sounds on it, but they're all smooth jazz organs – there isn't a really meaty church organ, for instance. You *could* spend a couple of hours and work one out, I suppose, but I had the organ before the PPG. Originally, I only had the string synth and the organ and I used to get all the sounds I needed out of just those two,

believe it or not. But then, that was before the first album.'

So the PPG came as a result of the advance from King's signing to CBS?

'Yes. I've been really knocked out with it. I first got it when the DX7s were just beginning to filter through, and everyone thought "great machine, must get one." But that soon changed to "what the hell do I do with it now, what do all these things do?." What I like about the PPG is that it's quite a bit more friendly than the DX7, because it's got all those analogue controls. Ironically though, it's only now that I'm really getting into some of the things it can do and understanding why it does them. I must have had it 18 months, which is a long time when you consider the way keyboards turn over these days.'

Yet in common with most modern keyboard players (and in spite of the fact that what he has now fits in fine with King's overall sound), Roberts is contemplating making some fairly drastic changes to his current equipment set-up.

'I know I've got to totally re-work my equipment, but I don't think you have to cover the stage in keyboards unless you're someone like Keith Emerson. I'd like to keep the PPG, partly because I like the sound of it and partly because I also like the response of the keyboard. I suppose I've got used to it now, but the Wave has a really peculiar touch-sensitivity arrangement whereby the whole keyboard hinges whenever you press harder on one of the keys. It's really weird, but I do quite like it.

'Ideally, what I'd like to do is get a DX7 and a MIDIfied JP8, and run them together. I don't like the sound of the DX7 on its own – it's much too clean. The set-up I've used on what will probably be the next single is basically a DX7, a JP8 and one of Richard Burgess' (Landscape founder member and now King producer) PPGs, all MIDI'd together. That way, you can get a nice clanky attack off the PPG, a mellow decay and sustain from the JP8, and a sound with a really short release time on the DX7. It sounds almost ADT'd in the end but it's not, it's just the way you set the release on the DX7. It's a really good, thick sound, and the DX7 just comes in and clips the sound off. There's a solo keyboard passage on the 12" version of the new single and it sounds really great, but it's just those three keyboards linked together.

'We also found some fantastic sounds when we were going through looking for that one, just by swapping around different sections from the different instruments, so I think that would be my ideal set-up.

'Having said that, of course, I also have a passion for Hammond organs. Whenever we play abroad I use a B3 Hammond, because it saves taking the VK1 over. It sounds ridiculous, the VK1 being so tiny and the B3 having two manuals and drawbars and everything, but I use one of those as a straight replacement, plus a PPG and a Juno 60 or whatever's available.

'I'd really love to own an old B3 and a Yamaha CP80 grand in addition to the other three, but now we *are* talking keyboards everywhere!'

And what about the latest (and seemingly fairly permanent) hi-tech music buzzword, sound-sampling? Does that fit into the King scheme of things?

'Well, the easiest sampling machine to use – that I've come across, anyway – is the Emulator II. In fact, it's so easy you don't know you're doing it half the time. You've only got to sneeze and play the keyboard, and it comes out! I had a couple of hours on one and was really knocked out by it, so perhaps I should consider one of those too...!'

Listen to any King record and you get the impression Roberts is first and foremost a pianist, yet he manages to do without a Johanna on stage. How come?

'I'd like to be able to play piano live, but we just haven't got the facility for it at the moment. The Yamaha CPs are the gig version of the piano, and I'd be interested in trying the Kawai one too – but they're a roadie's nightmare because they don't come apart. Of course, I *could* always go totally over the top, get a Kurzweil and carry it around myself!'

Technology

But the way things stand now, King have no more need for modern technology than they do for media hype or recording studio gimmickry. As far as keyboards are concerned, the band's lack of need for the likes of sequencers is a direct result of Roberts' manual dexterity and, specifically, his more than useful left-hand technique.

'Actually, I don't think my left hand *is* that good, but I don't sequence anything we use during the set anyway. For a start, until we had the Version 4 software put in the 2.2, I daredn't leave anything in it because it used to crash at regular intervals. Now we've got that software the sequencer's a lot more stable, but even so, once you start using sequencers everyone's got to come off a click-track, and you get into an entirely different field that can take away some of the spontaneity. We've had no need so far to restrict ourselves tempo-wise, and I think that adds a lot to the humanity of the performance.'

On the subject of tempo, King don't possess a regular drummer as such. Richard Burgess saw to any of the drumming chores not taken care of by assorted drum machines during recording of the band's first album, so who looks after the beat live?

'Adrian Lillywhite – Steve Lillywhite's brother – is helping us out. We did have a couple of drummers right in the very early days, but we never found anyone that was that solid, and Adrian's ideal for the job at the moment because he *hits* the drums so hard. We don't use any drum synthesisers or rhythm boxes or anything like that, so it's essential to have that rock-solid beat in the background. I don't really think you can beat a good kit sound.'

So, computer technology plays little or no part in shaping Roberts' (and King's) live sound. Surprisingly, the same goes for studio work, too, as he explains.

'There isn't anything on the album that's played by computer. In fact, the nearest thing we got to sequencing was three of us struggling for a day-and-a-half with Page R on the Fairlight. Eventually Richard said "can you play it?", and I said "yeah, just let me have a go!"; so we did it, and we got it down in about half an hour.

'That built up a kind of rapport between us, because Richard's great forté – apart from playing drums, of course – is keyboards and keyboard sounds: that dates back to the Landscape days, I guess. From then on he kept the Fairlight in, but we never touched Page R again. We didn't have to, which was nice – it was nice for me because I had that freedom again, and it was nice for the rest of the band because no one else had to sit down with a click-track and make sure everything was bang on time.

'I think that amount of clinical recording can lose you a lot of live feel – the kind of feel we were trying to get on our album. It didn't actually *work* for a first album, though, 'cos none of us actually knew what we were doing in the studio. I think the next album, which we'll be recording soon, will end up sounding a lot more wild – more like the live show. The live performance is definitely different from the album, and that's what we're going for.'

Performing

So King are a fun-loving but professional group of musicians who care more for the passion of performing in front of an audience (albeit one endowed with an overwhelming majority of teenage girls) than they do about surrounding themselves with technology. Yet Roberts adheres to the peculiarly British school of performing thought that says a keyboardist should be heard and not seen. At a King gig, you've got to position yourself carefully if you want to get a decent view of him at all, as he's invariably lurking at the rear of the stage behind the dominating figure of band mentor Paul.

Which is odd, because as Roberts admits, being stuck in a more or less static position

behind a rack of keyboards isn't really his idea of having a good time.

'I like leaping about, which is pretty good because none of the keyboard lines in our music is at all difficult, so once you've played them a few times you can concentrate on leaping up and down and not have to worry about playing wrong notes.

'We've tried having the keyboards loads of ways round on stage. I've faced the wings with my back to the drummer, but that felt totally weird, having everything going on behind me; then I tried standing with my back to the audience so that they could see what I was doing, which I didn't like either; then we tried the other way round, and they couldn't see me at all because the three keyboards are quite high. So the present arrangement seemed to be the only viable alternative. I'm quite happy with it, though, 'cos I can see the audience *and* everyone on stage.

'Anyone who's been frustrated at having to stand behind a stack of keyboards watching all the other guys zooming around the stage *must* have wanted one of those remote keyboards. I've always wanted to play out front, but every time I mention it to the rest of the band they just shout "poseur!" And they do it all the time!

'I do like the idea of having one keyboard on stage and everything else off stage. I tried out the Yamaha KX1 in a shop recently and unfortunately they couldn't get it working, but I love the idea. I tried the Roland Mother Keyboard system out too, but I didn't like the action at all, and playing brass sounds on it is totally peculiar. Just imagine it, brass sounds on a piano keyboard! It messed my head up for days.

'And I once had a go on a Moog Liberation, but that was the most disgusting instrument I've ever had the misfortune to come across...' Nuff said.

Progression

Time for a quick Roberts History lesson, then. Most classically-trained pianists find the transition between acoustic and electric playing a fairly confusing, not to say traumatic, experience, and the King keyboardsman is no exception – especially when it comes to changes in hardware.

'I haven't actually had that many instruments, because I always played piano until I was 15 or 16, and it wasn't till then that I actually considered playing any other keyboard. It was about that time that all those horrible synth sounds came out. You know, the Chicory Tip MiniMoog pitch-bend horror – it was bound to raise my interest, and since then synth sounds have really taken off.

'I was lucky enough to have an electronics engineer for a father – who was also a church organist so he was well into keyboards – and he built me an organ that I was so anxious to start using, it never actually got finished off. It was all chipboard, bare wood and wires, and looked rather like the old Clavinet D6. It was affectionately known as "the harmonious plank", but it fell apart in about a year or so. It sounded really good – like a cross between a Vox Continental and something that isn't an organ at all! Actually, I've still got it at home in the loft somewhere so I'll have to get it out and sample a few of the sounds off it. That should be fun...

'I had a Jen Pianotone then. It was a horrible tinny thing, but I thought it was great simply because I could pick it up and carry it around. I used to give piano lessons at the time and one of the guys I gave lessons to had all the gear – a MiniMoog, a Fender Rhodes, a Vox Continental and a *huge* home-built suitcase synthesiser – and I used to borrow all that. I never got on with the MiniMoog because I couldn't come to terms with the fact that you could only play one note at a time. But at the first gig that King ever did I used his Fender Rhodes – thanks, Graham!'

Training

Still, the discipline offered by a classical training is either an indispensable gift or a decidedly mixed blessing, depending on who you talk to. Having spent his formative years on the receiving end of a healthy dose of such training, does Roberts regret that his musical time could have been better spent?

'No, not at all. It saves all this business of sitting round computers flicking switches (*methinks this is a reference to step-time input – Ed*), and I'd much rather play a keyboard than stand there and watch whilst the technology plays away. I suppose I'm a bit of a dinosaur in that respect, as just about everyone else is going off into the realms of keyboards playing themselves.

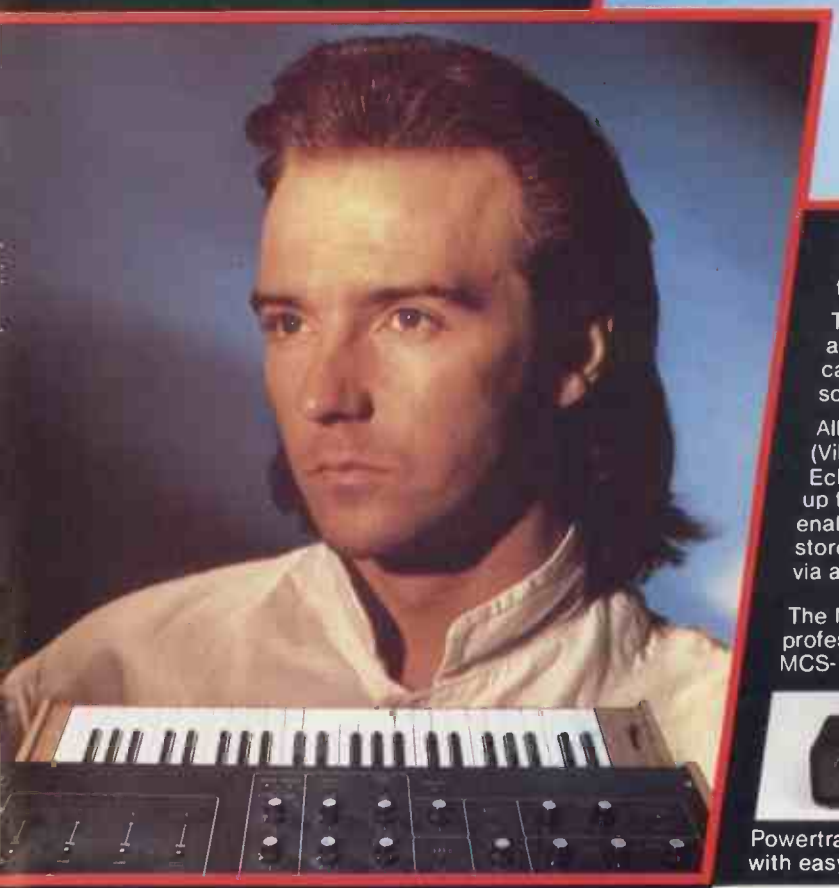
'Apart from the PPG, I've never had access to anything that could do that sort of thing, so I'm quite a way behind the times. But if it's a case of sitting down for an hour and working out how to make a machine play something, then I'd rather just sit down and play it myself.'

Well, thank goodness there's still room for the odd dinosaur here and there, even in today's increasingly fast-moving musical landscape. ■

MCS!

DIGITAL SAMPLER & DELAY LINE

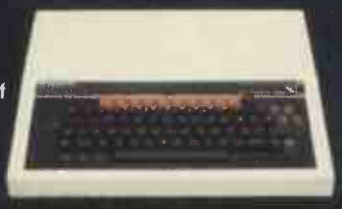
Just one of our customers for the MCS/1 - Midge Ure of Ultravox.
Get the professional sound of a Powertran MCS/1 into your act.



Once again, Powertran and E&MM combine to bring you versatility and top quality from a product out of the realms of fantasy and within the reach of the active musician.

The MCS-1 will take any sound, store it and play it back from a keyboard (either MIDI or v/octave). Pitch bend or vibrato can be added and infinite sustain is possible thanks to a sophisticated looping system.

All the usual delay line features (Vibrato, Phasing, Flanging, ADT, Echo) are available with delays of up to 32 secs. A special interface enables sampled sounds to be stored digitally on a floppy disc via a BBC microcomputer.



The MCS-1 gives you many of the effects created by top professional units such as the Fairlight or Emulator. But the MCS-1 doesn't come with a 5-figure price tag. And, if you're prepared to invest your time, it's almost cheap!

MCS-1 complete only **£849** + VAT
Save even more with the MCS-1 kit: only **£599** + VAT
Demonstration Tape **£2.50** + VAT

Powertran kits are complete down to the last nut and bolt, with easy-to-follow assembly instructions.

Specification
Memory Size: Variable from 8 bytes to 64K bytes.
Storage time at 32 KHz sampling rate: 2 seconds.
Storage time at 8 KHz sampling rate: 8 seconds.
Longest replay time (for special effects): 32 seconds.
Converters. ADC & DAC: 8-bit companding.
Dynamic range: 72 dB.
Audio Bandwidth: Variable from 12 KHz to 300 Hz.
Internal 4 pole tracking filters for anti-aliasing and recovery.
Programmable wide range sinewave sweep generator.
MIDI control range: 5 octaves.
+1 V/octave control range: 2 octave with optional transpose of a further 5 octaves.

POWERTRAN
CYBERNETICS LIMITED

POWERTRAN CYBERNETICS LIMITED
Portway Industrial Estate, Andover, Hants SP10 3EM, England
Telephone: Andover **(0264) 64455**
Access/Visa cardholders – save time – order by phone.


YAMAHA
YAMAHA
1985
YAMAHA
DX7

A hands-on guide to home recording...

If you're serious about home-based music production, or resent paying for studio time to do your demo tapes, Yamaha offer a complete and perfectly integrated system designed for people who want the affordable best.

D1500: **World's first MIDI/Programmable Digital Delay** ■ 16 programme memories + Pass ■ delay to 1023ms ■ full range of effects plus Hold & Repeat.

GC2020: **2-Channel Compressor/Limiter** ■ Stereo or Dual Mono ■ comprehensive control features ■ expander-type noise gates for silent operation.

R1000: **Digital Reverb** ■ 4 reverb times (1.5 - 2.4 secs) ■ low noise/wide frequency response ■ 3-band parametric EQ.

GQ1031: **High resolution single-channel 31-band Graphic EQ** ■ 20Hz - 20kHz ■ 12dB cut or boost ■ ideal for aux. EQ or in pairs for monitor alignment.

Q2031: **Stereo 31-band version of GQ1031** ■ range switching (±6dB/±12dB) ■ continuously variable High Pass Filters.

P2150: **Pro-quality Power Amplifier** ■ 2 x 150W ■ full protection circuitry ■ Clip/Protection indicators ■ fan cooled.
Also available: **P1150** - 150W Mono **P1250** - 250W Mono **P2250** - 2 x 250W

YMC10: **MIDI Converter Unit** ■ allows MIDI-based equipment to be synchronised to your multitrack recorder.

S10X/ S20X: **Super-compact, high performance speaker systems** ■ full range 65-20,000Hz ■ S10X - 75W Program ■ S20X - 150W Program ■ choice of mounting accessories.

MT44D: **High-performance 4-track cassette deck** ■ Dolby B & C ■ light-touch transport logic ■ forward/reverse cue with search ■ count/time tape counter ■ punch in/out ■ vari-pitch ■ optional Remote Control (RC10B).

RM602: **6-into-2 Mixer** ■ 4 Tape/2 Phono (all with Line/Mic) ■ Input channels - 2-band EQ, Effects Send, Pan, Monitor Mix ■ Tape Out selectors for easy multi-tracking ■ ideal for independent use e.g. keyboard mixer.

RB35B: **Rack and Patch Bay** ■ eliminates need for rear panel connections ■ includes Tape Sync.

RX15: **PCM Digital Drum Machine** ■ MIDI compatible ■ 15 voices ■ real/step-time programming ■ Stereo Out with Pan ■ Cassette data storage.

You can't beat the system

YAMAHA

MUSICAL INSTRUMENTS

● MOUNT AVENUE, BLETCHLEY, MILTON KEYNES, BUCKS, MK1 1JE
☎ (0908) 640202 24hr Ansaphone (0908) 649222

LOOSE ENDS

Steve Nichol and Carl McIntosh, Loose Ends' two-pronged instrumental element, share a few jokes and discuss English songs and American sounds.

Tim Goodyer

The night before, Loose Ends had been involved in the recording of The Lenny Henry Show. Nothing so wonderful about that, you might say. And for the band – arguably Britain's hottest electro-funk trio – it was probably nothing special. But for a sheepish and inexperienced interviewer like yours truly, the night's recording did two things. First, it gave Loose Ends a good reason to get to the interview two hours late (which meant two hours' more nail-biting for the interviewer), and second, it put the band's instrumental strikeforce – comprising Steve Nichol and Carl McIntosh – in a cheerful and exuberant mood, as a result of which they spoke at great length in response to probing.

In fact, the duo did a lot more than talk at length. What they said made an awful lot of sense – so much so that in the final analysis, Goodyer's contribution paled by comparison. Which is why what follows is 90% Them, 10% Me.

Makin' Ends Meet

Let's get the biog bit out of the way first. Some of you may be familiar with Steve Nichol's name from his work with The Jam; he played keyboards and trumpet on their *Gift* album as well as playing with them on their farewell tour. But it's only with the release of a second album, *So Where Are You?*, and the success of its first single 'Hangin' On A String' that Nichol's own band, Loose Ends, have come into the public eye in a big way.

'Hangin' On A String' is one of those outrageously simple, silky-smooth dance tracks that's difficult to get out of the musical memory once it's made its way in (which doesn't take long). Essentially TR808-based, the song's distinctive vocal interplay (between McIntosh and the third Loose End, Jane Eugene) and tasty but fresh production job gave it a big following on the club circuit, and that eventually pushed it into the UK Top 40 a month or two back.

As a result, the band look to have a fairly secure musical future, but that wasn't always the case. Steve Nichol takes up the band's story.

'I first met Jane at a party after a fashion show in 1981. We got chatting there and I found out that she could sing. We started rehearsing a band – supposedly Loose Ends – and after a while Carl came along. That made life a lot easier because then we were able to whittle the band down from about 11 people to three.

'We were looking for a multi-instrumentalist who could write songs as well, and that's exactly what Carl turned out to be. So from Day 1 we knew exactly what we wanted – both in terms of sound and personnel.'

And what *was* the sound the band decided to go for?

McIntosh: 'I think we wanted Loose Ends to stand for a silky, classy sound, because that was the time when Brit-Funk was at its height, and all the bands were playing really hard, fast, raw funk. I suppose you could say that we cheated, because we've got an American sound and yet the songwriting is definitely English, so we struck a happy medium there.

'I used to be in a band called Uptown People, and we loved all that Brit-Funk stuff at the time, but you can only have so much of it. Reggae is another favourite music of mine – but the guitar chips in that get monotonous after a while. I feel I have to have more scope both when I'm listening and when I'm playing; everything has to have a bit of diversity to it.'

Makin' Time

They might have shared similar musical ideas, but the three Loose Ends came from very different backgrounds. Nichol had left school to study at the Guildhall School of Music and Drama, Eugene was intent on being a model (and working at the London College of Fashion) when she suddenly discovered she could sing, and McIntosh was a session bass player who'd received instruction from jazz veteran Peter Inde.

Yet the combination worked. And before long, Loose Ends made the transition from drummer to drum machine, something that proved instrumental(!) in shaping their distinctive sound. Was the move a deliberate one or something they just stumbled across during the band's early evolution.

McIntosh: 'When we cut down the band we had to make a choice between having a drummer or making life a lot easier and going for precise time with a drum machine.

'When we went in to record our first single, we had parts of that first band helping us, but the drummer found it hard keeping time with a click-track. Either the click-track put him off or he couldn't handle the song and the click-track as well. It was at the time when music was going through that period when everything had to be in strict time; remixes were happening and people were putting Beats Per Minute figures on the record sleeves.

'We were young and green at the time and we didn't really recognise the importance of having a click-track, but being in a situation

where production was taking place on quite a big scale, we began to appreciate that our sort of music ain't about gettin' the drummer whackin' away. It's about keepin' in time, getting arrangements right, and doing everything absolutely straight.

'And we started opening up. Steve got a drum computer down to the session where we were doing demos, and that's when we really got into it.'

Nichol: 'Funnily enough, 'Hangin' On A String' was the first time we'd ever used the TR808 – and that was only because our producer, Nick Martinelli, wanted to go for that sound. We originally wrote the track over a LinnDrum and it was a lot more uptempo.

'On the demos that we got down for 'Hangin' On A String', we were originally going for a 'Thriller' vibe, with the Linn and a load of sound effects, but Nick opted to go for the TR808.

'Now we look at the 808 as our own drum machine – we love it! On the album we've used the 808, Drumulator, LinnDrum and a real drummer, Tommy Campbell, who's played with the Mahavishnu Orchestra and Santana.

'You could say the 808 has been surpassed by current technology, but it's trendy. If you've got a single out with the TR808 you're basically onto a hit single in the dance charts. It's like a MiniMoog – it's not one of those things that'll go out of fashion.'

McIntosh: 'You know, it's like when the ensemble string sounds first came out, and *everyone* was using them. After a while it seemed better to use the string synth *as a string synth* than to try and get it sounding like an orchestra, and that's what we've done with the 808.

'The secret is to take the technology and use it for what it is, not what you want it to be. I mean, I don't know who's down there at Roland, but if that's supposed to be a real authentic cowbell sound...shoot 'em, Man! But we like it – that's why there's so much of it on 'Hangin' On A String'.

'It's ironic, but I was doing a rehearsal with Carol Thompson about a year ago and they brought an 808 in. I didn't know anything about drum boxes then, but we were playing with the drummer and the TR808 together and it sounded *wonderful*. But I never really knew what it was until we had ours. I don't know why it is, but it really works well with funk.'

Makin' Music

The sophisticated layering of the hit single runs most of the way through the album, too, from the uptempo beat of the follow-up 45, 'Magic Touch', to a dynamic (and invigorating) cover version of Bowie's 'Golden Years'. Producer Martinelli must take much of the credit for that, with the rest going to Loose Ends' unlikely but nonetheless effective choice of instruments. To begin with, there's the unorthodox but carefully selected range of textures on the hit, with a startling clavinet sound as the high-point. How was that achieved, exactly?

McIntosh: 'It's a Clavinet. We took it out of the cupboard, dusted it off and thought: Yeah, this is the shit! It's like the MiniMoog in its irreplaceability, you can't beat it.

'All the sounds on 'Hangin' On A String' go back ten years – apart from the organ sound which isn't an authentic organ. I wish I could say it was.

'We used all the old sounds that people had forgotten. Textures were what we went for and, I think, textures were what won it across.'

> 'The secret is to take the technology and use it for what it is, not what you might want it to be.'

Nichol: 'But there is a DX7 on the album! There's also a MiniMoog, an Emulator I, a Steinway Grand Piano, a DX1, a Prophet 5 – because there are some sounds on a Prophet that you just can't beat – and also we used a Dyno-My-Piano.'

Er...a what? Carl McIntosh explains. 'There's a guy in New York called Bert Hanson. You send him your Rhodes and about a grand, and he takes all the hammers and adds an EQ system to each one.

'You can also get it modified for your touch – light or fast or whatever. And when it comes back it sounds like glass. We used it on the first album as well, and for a ballad it's just excellent – you can't beat it.

'It doesn't even look like anything nice because after he takes it apart, he puts his own cabinet on it. It's just like a speaker cabinet over a Rhodes. In Philadelphia they record an awful lot of ballads, and just about every one you hear uses a Dyno-My-Piano. It's become part of the characteristic Philly sound, I guess. But there are actually only two or three in Philadelphia at the moment. Herbie Hancock's got one, Alpha Studio have one and Sigma have one – and that's it.'

If the Ends seem to know a lot about Philadelphia, the reason is simple. The band recorded both *So Where Are You?* and last year's less successful predecessor, *A Little Spice*, in the Pennsylvania capital. There, they took advantage both of Martinelli's music biz clout and the sympathetic ear of engineer Bruce Weedon...

McIntosh: 'We used the MiniMoog for a lot of the bass sounds on 'Hangin' On A String', for instance, but a lot of the sounds on that song aren't synthetic overdubs at all – they're voices, guitars and more natural sound effects, modified through the desk by Bruce.

'He's really excellent. He can take things like tiny finger snaps, filter and EQ them until they're unrecognisable, and make them larger than life. He's a sounds man. If you can cough, he can turn it into music.'

There *are* a lot of synths on the album though, aren't there?

Nichol: 'Oh yeah. The good thing about Nick is that within the album budget, you have more opportunity to use different instruments and synthesisers. When we were over here, we felt that producers we worked with tended to use synthesisers they had used before.

'They'd hire in a big Jupiter 8 'cos that's what they'd worked with on their last project. Then they'd sit there doing 20,000 synth overdubs and not gettin' anywhere – the song still didn't sound any better.'

McIntosh: '...Whereas Nicky listens to a song while it's happening and looks for something new to fit the song. He'll use anything new – he's looking for new sounds and textures all the time.'

Nichol: 'When we did our third single, 'Don't Hold Back Your Love', with Pete Walsh producing, he sent us in completely the opposite direction. We used the JP8 for most of the synth parts and I found that really dull. I don't know what it was down to. There were 250,000 sounds on there but he'd used them all on his last project. He was saying "these are the sounds you've got to use – they're in vogue."'

McIntosh: 'It was China Crisis and Heaven 17. He's good, but it's the same as if we'd used Steve's DX7 for all 48 tracks – it wouldn't sound right. It sounds like one type of synthesiser, texture after texture. Sounds have to complement each other, and the way to do that is to mix different synths, because if they're different makes, they're gonna have different textures anyway. That's why we mix the organ sounds and the guitar sounds the way we do – *against* each other.

> 'Our engineer is excellent. He's a sounds man: if you can cough, he can turn it into music.'

'It's just like mixing drum machines, using Simmons chips in the Drumulator. Or take the Oberheim Xpander, which works really well, sound-wise, with the DX7.

'There's no Fairlight on the album because we weren't impressed with it when we used it. We used it with Dexter Wansell (the band's strings arranger/composer) when we did the P P Arnold album. He got some great sounds out of it, but you really have to know it.

'It depends on who you get to program it, 'cos if the programmer isn't quick, whoever is producing the album is going to get bored. In America a programmer will come in and listen to the track and pick out the sounds he thinks will sound best, then you can work off that, but over here it's like buying a car. They come in and show you the choice you have on the Fairlight, rather than giving you some guidance and taking out what they feel would be best for the project you're working on.'

Makin' Records

But the secret of good songwriting doesn't lie exclusively in the domain of equipment and production. More often than not, a bit of human empathy can come in handy, too, and Nichol and McIntosh seem sure they know where to find it.

McIntosh: 'When we're writing, even if we're doing it with an outsider, which we often do, we all take an equal share of the credit. The reason for that is simple: you've got to be mates. You've got to keep the company sweet. Everybody's got to work and everybody's got to know exactly what's going on. There've been times when we've had a bad day and I've wished I could just go home, and Steve and Jane must have felt that too. But because your involvement is so total, it's only you that's got anything to lose. You think twice because it's your future, and because you know you're all working for the same cause.'

Nichol continues in a similar vein. 'At first it's hard, but as soon as you see the light at the end of the tunnel, you realise things aren't so bad after all. Everybody's been totally relaxed since the success of 'Hangin' On A String'.

'I guess we first started seeing the light around the time of the first album, when we went to America. We come from Brixton originally, and we used to just rehearse in someone's house. So when we got to Philadelphia and were treated like real people that, in itself, was some sort of pay back.'

McIntosh: 'We went to Philadelphia to record the album because that was where Nick wanted to work with his team, so we were very lucky really. He just came over as soon as he'd heard the demos. We were going to do the album here, it was all kosher, and all of a sudden he decided he didn't like what he saw here in terms of recording facilities. He didn't like being a stranger, either. It was his first international project and he didn't want to mess it up, so he got us to come on over to Philadelphia – he thought he'd be able to think better in his own environment. And that's how we got the holiday!

The band might have enthusiasm for the American way of putting a record together, but as far as songwriting goes, they're in no doubt as to where the best material is being written.

Nichol: 'If you take any American song and put it beside a British song, the British song will stand up with more credit, simply because we write better songs than the Americans do.

'The Americans have got the grooves, there's no argument there, but the body of song is in England – and I think they know that as well. Before we had any success over here, American artists were asking us to write for them.

'They even want you to comment on the way they phrase their lyrics, they'll ask you to comment. They want to get your approval – it's really weird.'

Makin' Movies

That Loose Ends have more strings to their collective bow than a single and an album is evident, but their activities aren't confined to any purely aural medium, as they explain.

Nichol: 'We're doing the score for a new David Putnam film called *Knights and Emeralds*. In fact, we're starting work on that tomorrow.

'It sounds as if it's going to be a really interesting project – it's about two rival bands from Wolverhampton. I think that'll come out around Christmas time.

'We're really chuffed about it, 'cos it's our first film work. We're going to go at it with fangs! I think there'll be other bands involved – I know Sade's going to be in on it somewhere – but we were about the first to be asked, which is nice.'

All in all, Loose Ends are past the doubting stage and now have every confidence in what they do. Spending just a couple of hours in their company, it's hard not to be affected by that confidence, and harder still to foster any reservations that their future might not necessarily prove as rosy as they feel it will be. Loose they might be – at an end they most certainly aren't. ■

Make it big with Musicworks.™

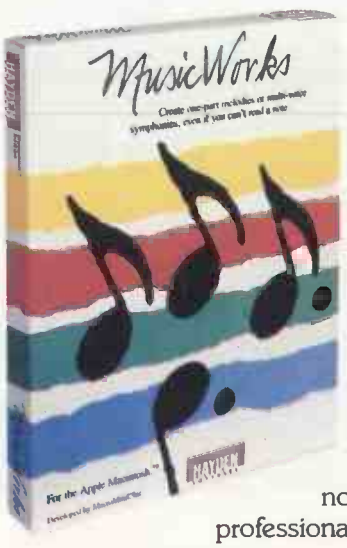
They had everything going for them. Good looks, determination and a great image.

But one thing stood between the Sydney Saunders Skiffle Duo and success in the music business. Talent.

But blessed with a good ear for a winner, Sydney laid out a few notes for Musicworks. A major development from Hayden Software.

FOR BUDDING HOLLIES EVERYWHERE

Even if you can't read a note, Musicworks enables you to compose music directly on your Apple Macintosh,™ and hear the results instantly.



You compose on a seven-and-a-half octave grid. Just like the keys on a piano. As you put down your notes you hear them. All in the click of a mouse.

When you've got your latest masterpiece sounding just right, Musicworks transforms it into a musical staff, inserts the right notation and prints it in a professional format which any musician can follow. Even Sydney.

Now he can drum up any tune he likes. Change and edit notes. And then play back the whole melody whenever he wants.

THE FAB FOUR

Another feature that Sydney likes to harp on about is Musicworks' built-in instrument selection.

Use up to four at a time from a total of 10 or listen to each one selectively. Musicworks also comes complete with templates which guide you through playing classical and popular selections.

It's available from your local Softsel dealer. Along with over 2,600 other titles from over 250 publishers.

However there's still one slight hitch in Sydney's rise to stardom. He's been charged under the Trade Descriptions Act over the name of his latest album – "Sydney Saunders Entertains".

Musicworks – A sound investment.

SOFTSEL®

The number one distributor of software. In the world.

Softsel Computer Products Ltd, Softsel House, Syon Gate Way, Great West Road, Brentford, Middlesex TW8 9DD.


R2R
Roland
MKB-1000

oland Mother Keyboard

MKB-1000

The MKB-1000 pictured here is Roland's top of the range MIDI Keyboard Controller.

Send now for full details of this, and for your FREE copy of Roland's MIDI System booklet, together with the name and address of your nearest stockists.

Roland

Roland (UK) Ltd
Great West Trading Estate
983 Great West Road
Brentford
Middx. TW8 9DN
Telephone: 01-568 4578

THE NEW SIMMONS SDS 800 SERIES

SDS 200 TOM TOM SYSTEM

SDS 800 DRUM KIT

SDS 400 TOM TOM SYSTEM

Take it any way you like.

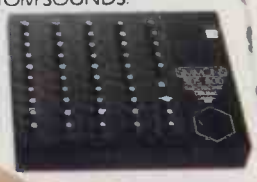
There's never been a more flexible, better value for money way to play the power and versatility of Simmons than our new SDS 800 series. A choice of three systems which can be used by themselves, or as an expandable part of any acoustic or electronic kit. Systems with a whole range of Simmons innovations, like new pads that play and respond as well as any acoustic kit. See your dealer about the SDS 800 series soon. And play it your way.

SDS 200 TOM TOM SYSTEM

- 2 TOM TOM CHANNELS.
- NEW STYLE PADS.
- FLEXIBLE SOUND PROGRAMMING.
- UNIQUE 'SECOND SKIN' CONTROL.
- HEADPHONE JACK.

SDS 800 DRUM KIT

- 4 CHANNELS, WITH BASS, SNARE AND 2 TOM TOMS.
- FULLY PROGRAMMABLE RUN GENERATOR THAT LETS YOU PLAY A MULTI TOM FILL BY HITTING ONLY ONE PAD.
- NEW PADS FOR DYNAMITE DYNAMICS AND GREAT FEEL.
- FLEXIBLE SOUND PROGRAMMING.
- UNIQUE 'SECOND SKIN' CONTROL FOR DOUBLE-HEADED TOM SOUNDS.
- HEADPHONE JACK SO YOU CAN PLAY, WITHOUT THE NEIGHBOURS PLAYING UP.



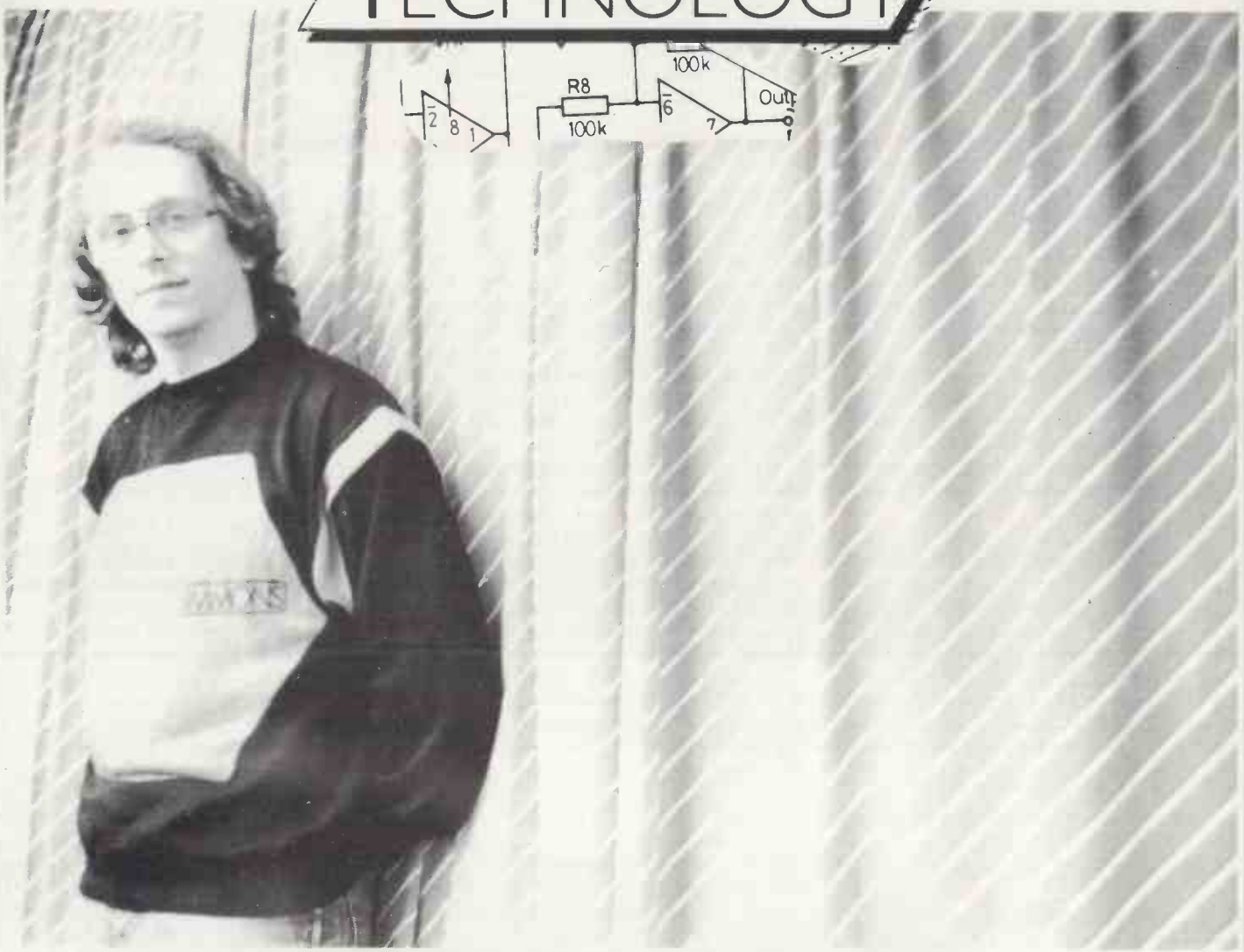
SDS 400 TOM TOM SYSTEM

- 4 TOM TOM CHANNELS.
- FULLY PROGRAMMABLE RUN GENERATOR.
- NEW STYLE PADS.
- FLEXIBLE SOUND PROGRAMMING.
- UNIQUE 'SECOND SKIN' CONTROL.
- HEADPHONE JACK.

SIMMONS

SIMMONS ELECTRONICS LTD. ALBAN PARK, HATFIELD ROAD, ST. ALBANS, HERTS. AL4 0JH

TEL: (0727) 36191 (5 LINES)
TELEX: 291326 HEXDRM G.



TECH*talk*

Dave Simmons, inventor of the electronic drum and one of Britain's most successful music industry figures, discusses technology, drummers and promotional clothing. *Paul White*

E&MM: How did all this electronic drum business start? Presumably you were in electronics of some kind before all this came along...

Dave Simmons: Electronics and music, but first of all music. I'd been playing the piano for years and years, I was playing in rock bands throughout my youth.

When I left school I went into electronics making oscilloscopes with Tektronics. I got a place in College, did an ONC in Electronics and failed it miserably, so I ended up being a fault-finder with them.

Then I left just before they were going to sack me, and joined Boosey and Hawkes' electronics division at the time that they'd just bought ARP Synthesisers. They had an old guy down there who just couldn't cope with it – he was just used to valves. The big problem in those days was that Boosey and Hawkes, a very staid brass and woodwind manufacturer, sent synths to all their staid, old-fashioned dealers, who in turn used to send them back saying they weren't working. The problem, of course, was that they didn't know how to get any sound out of them.

So I was around servicing synthesisers, as well as carrying out lots of modifications on keyboards for various groups and people. I was fitting Solina string machines with synthesisers – I used to fit a filter, an ADSR generator and a phase switch modification to those – and I did about 50 of them in all. It allowed you to get brass sounds out of the synthesiser bit. Actually, you can get some great sounds out of that: you can switch into square waves by turning off the diodes that clip the square wave and get some nice flutey sounds out of them.

So how was the transition made into percussion if you were a keyboard player originally?

I was playing with a group at the time and messing around building bits and pieces; I used to have my Hammond going through my string machine to get the phasing. A guy called Barry Watts, who used to play with Adam and the Ants and Paul Young, and who's still knocking around trying to earn a living playing drums, had me build a few bits and pieces out of tubular bells and bits of electronics. We were a bit of an avant garde band – 20 minute opuses and all that sort of crap – and it started from there. I built two different drum synthesisers for him.

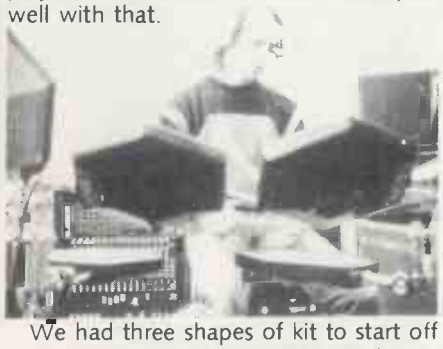
After I'd done that, Boosey and Hawkes ▷

decided to concentrate on brass and closed the electronics division down, so the Sales Director and myself set up a company called Music Aid. We imported Ampeg amplifiers, Washburn guitars, guitar straps, Asba drums – that was his side of the business, and my side was carrying on the modification and servicing of synthesisers.

That little company grew for a couple of years, and then I developed the SDS3, which came out at exactly the same time as the Syndrum came out in the States. The record 'Dancing in the City' came out and everybody wanted that horrible sound, so all of a sudden I found myself having a lot of demand from UK drummers for this little box I was building. Premier made the drum part of it, basically an eight-inch skin and a lump of wood, and I built the electronics in a garden shed in Radlett.

From there we moved to Hatfield Road and introduced the SDS4 and the Clap Trap. Gradually the manufacturing side was taking over from the wholesale side, partly because we'd bought lots of things that we couldn't sell, mainly Asba drums and Ampeg amps.

We took two channels from the SDS3 and found that they made very convincing bass drum and snare sounds, so I took two of those channels and made it into a modular kit in a standard rack – that was the SDS5. I decided to get away from acoustic heads because I couldn't make the electronics work with an acoustic head and a microphone – there were crosstalk problems and noise on stage and limited sensitivity – so I decided to bury a pickup in a lump of wood and said that was what you played – the electronics would work quite well with that.



We had three shapes of kit to start off with. One was hexagonal, one was heart-shaped and the other one was a bat's wing. They all looked a bit odd, really, though I suppose the hexagon was the least odd. We made three of these prototypes for the music show in the summer of '81, but we couldn't get into Olympia because we couldn't afford it, so we had a room in one of the hotels across the road.

The first kit we managed to get finished was the hexagonal one, and we had it set up in this hotel room with amplifiers, and most people came in, bashed it and laughed. A few people came in, bashed it and loved it.

But we couldn't *give* them away to the music trade. They didn't want to know about electronic drums, because drum shops don't have amplifiers – half of them don't have electricity in them – and they knew they couldn't sell this stuff. During that period we had lots of debts and lots of problems with the company, so we wound it up just as we were launching the SDS5. We couldn't get finance, no one wanted to back the drums, and no one thought they were a good idea.

I suppose the breakthrough came when you got the stick-click sound. How did you come up with that?

Well, there's a lot more to it than that. The SDS3 had all those components in it. It had noise, it had click, it had the tone component, it had modulation. It actually had more facilities than the 5, which made it quite a versatile little synthesiser. But it became a case of taking all those parameters and asking ourselves which were the most useful, and then making that relatively accessible to the drummer. The kit had to have a factory preset that made a reasonable sound, and very limited control that really didn't produce any way-out or frightening sounds. Another thing was that the drums themselves had to be the right sort of size so you wouldn't feel too frightened to sit behind them.

How did you come up with the idea of giving people less control? Was it a result of getting feedback from drummers?

Well, drummers wanted something different from normal drum sounds, but not *that* different, because they still had to do the job of bass drum, snare and tom-toms. They really weren't interested in all the odd sounds.

It was the enormous tom-tom sound that really cracked it, and the SDS3 made that sound by linking two of its channels together. At the end, we were selling SDS3s not as four-channel drum synthesisers but as two-channel bass and snare synthesisers. We fitted switches on the back so that you could link two channels together, and then showed people how they could get good bass and snare drum sounds – and they weren't LinnDrum sounds or anything like that.

The 5 took that sound and put it in a smaller unit, with just those variables on it so that it was restricted to drumming terms – damping the sound or not damping it, how much tone you have, how lively it is, how much attack you have. The analogue circuitry was nothing special, just very accessible so that a drummer could sit down, plug it into an amplifier, and get this great sound coming out. They were musically useful as well, because they weren't strident – they could be used in lots of different sorts of music.

How about the perennial problem of amplification? The ideal drum combo would have different specifications to the ideal guitar or keyboard combo, wouldn't it?

It's only a problem in that now you have to have an amplifier, whereas drummers haven't had to up till now – they've always been able to leave it to the PA. And actually, I'm not convinced the demands of electronic drums are that different to the requirements of a good Public Address amplifier. An amplifier that's designed for miked-up acoustic drums will obviously be able to reproduce the sort of signals that an electronic bass drum can produce.

But how do you go about getting something that's fairly small and punchy, suitable for stage monitoring or club work?

That's always been a problem. I'd say talk to bass players – they've had this problem for ages. It's a compromise between the volume you want to monitor at and how many speaker cabinets you want to move around. There are some quite compact, powerful amplifiers around, but it's just the bass end that's the problem.

We're not actually in the business of producing amplifiers as a company. What we are doing is looking at amplifiers specifically for electronic drums that we can sell. Trace Elliott have one and it's very, very good, but it's also very expensive. The problem is that when you hit an acoustic bass drum, you move an awful lot of air; in the case of the SDS9 and other drum kits that we produce, the bass drum is capable of moving even more air – if you've got the amplification. The 9 has better bass drum sounds than we've had before, and they sound better through a small combo.

'We had three shapes of kit to begin with: a hexagon, a heart, and a bat's wing. But they all looked a bit odd, really.'

Have you provided a bigger trigger pulse from the pad since the SDS5, in response to false triggering problems caused by pickup from stage lighting?

Before we were made aware of piezo crystal devices, we were actually using loudspeakers as pickups. For upward compatibility, we had to load the piezos we started using down to the same impedance, so that people could use existing 5s with old pads or new pads. Now, our new pads have a very high impedance, so we've got a lot more signal off them and we don't have that problem any more.

I know there are some SDS7 modifications on the cards, but aren't you worried that the SDS9 could render it rather obsolete?

We're very aware of our market. All I can do is bring out some more stuff which I think will help SDS7 owners, and to point out the fact that the 7 has 12 channels and that you can put any sound you want into it, and that you have far more parameters than you do on the 9, which has only five channels and is made specifically to sound like a drum kit.

It *is* a different instrument. Soon we'll be seeing the addition of the MIDI converter box for the 7, which'll have software transfer functions for different dynamic control. In other words, we'll be putting the computer in between the pads and the electronics. The 7 is going to be far more versatile than it is at the moment. You'll be able to take sounds off tape or acoustic drums, and trigger the SDS7 sounds cleanly and efficiently.

The 9 is aimed at a specific market – we

know we can sell lots of them – and it's priced accordingly. The one thing this company cannot afford to do is to stand still, even if it means we may lose the quantity turnaround on the 7.

If you look at the history, we were selling the SDS5 at about £1500, the SDS8 came in at £700, the SDS7 was priced at £2000 and the SDS9 at £1000. As the company grows, we can make things more efficiently and more cheaply – that continual process won't change. I imagine the SDS7 price will drift down – it'll have to under normal commercial pressure. We'll control it as best we can, but it's illegal to control the retail price of an instrument – and we're not prepared to wreck our own market.

There's a second head oscillator on the new kits. How does that work?

That's just frequency-modulation of the tone. Whereas the SDS5 had a very simple sinusoidal wave, this has the same waveform but frequency-modulated. Also, the pitch can change over time as the harmonic structure changes, while the modulation depth remains constant. Again, it's somewhat restricted compared with what it could be, but we've chosen the frequencies and the amount of modulation to produce what we, probably arrogantly, consider to be the best amount to simulate. I think with the SDS9 we've undertaken more consultation with drummers than we ever have before.

Do you find you have a problem in that when you trigger acoustic drums, you don't know what part of the cycle the oscillator's in?

I don't think you notice it on the tom-toms, but it is a problem with the low frequencies on the bass drum. The 800 series takes this into account so that the sound is consistent. Without it, you get a different quality to the sound depending on whether or not you trigger on a rising or falling edge. None of those beats taken in isolation would be an un-bass-like sound, but in the context of the previous hit, they can sound slightly off. Cycling is how I've heard it described. On the 800 series the oscillator is reset at each hit, and there's also a different click circuit that avoids using white noise bursts because, again, they can be different each time.

> ***'The SDS9 is aimed at a specific market. We know we can sell lots of them, and it's priced accordingly.'***

The sound of a cymbal is different every time you hit it but a digital cymbal always sounds the same. Are you going to produce a new cymbal design that gets round that?

The technical problems involved in producing a cymbal are far greater than those connected with producing drums. I think the cymbals on the 7 actually work quite well, but they're certainly not what drummers would call playable. We're working hard on cymbal designs, but whatever we eventually produce, they'll have to be more complex electronically than the drums are. Multi-sampling is the area we're heading in, but it's going to take some time yet.

Isn't there a case for cymbals that do the same job as acoustic cymbals, yet have a distinctive sound of their own. That's what you did with drums, after all...

I think that you set the target of trying to get as close as you can to an acoustic cymbal. It will never *be* an acoustic cymbal, in the same way an electronic drum will never *be* an acoustic drum. I hope in the end we'll produce something that falls short of an acoustic cymbal but still knocks people out.

And don't forget that an electronic cymbal will have other advantages, especially in the area of flexibility – in the tuning, the changing, and using it to create other sounds. These will start to become more important considerations than 'I can't actually damp it the same as an acoustic cymbal'.

The important job is to define the essentials of a playable cymbal, the same way as we defined those of a playable snare with the SDS9. We didn't do it with the SDS5 because it wasn't necessary to do it, and we didn't have the skill to do it anyway. The mere fact that it *was* an electronic drum kit was good enough then, but now things have moved on to having a hard rimshot, cross-stick, ambient snare, and being able to tune one against the other and have it *play* right. Then maybe it's better than an acoustic snare – not the same.

The launch of the SDS9 sees you gunning for the acoustic drum market, in that it has more of an acoustic sound than a traditional Simmons one. Presumably this was a deliberate move – the advertising slogan 'more than a match for the acoustic drum' is certainly pretty aggressive...

I would say that we pulled a few punches in the end. You should have seen some of the things we originally sketched out for the campaign... The fact is, a lot of drummers dismissed the electronic kit when they first hit one, and may never have touched an electronic kit since – especially those that don't get into studios and spend most of their time playing in club bands. It was a conscious decision to try to get some of those people back, and maybe anger some of them. All I'm asking is that you go in and hit the latest electronic kit once a year, that's all.

So is the SDS9 intended to form the basis of an expanding system?

Yes. The big progression, of course, is MIDI. All our equipment from now on is going to be fully MIDI-equipped. The two new boxes that we've got coming up will have the facility to use acoustic triggers to fire the SDS9 voices *via* MIDI, so you'll be able to change existing taped sound. We also have a real-time MIDI recorder in the pipeline. And MIDI keyboards and keyboard recorders can also be used to trigger the SDS9, as can the little CBM64 Programmer we've just brought out.

Finally Dave, why is it that the Ad guys always get the freebie t-shirts and sweatshirts, while the journalists get bugger-all?

Oh, it's the free sweatshirt routine again, is it? Come with me... ■

See this month's Newsdesk *for further details of the Simmons SDS9, SDS800 and CBM64 Programmer.*

FANTASTIC NEW Roland PRODUCTS

NEW

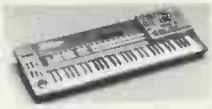
ROLAND SRV2000 STEREO DIGITAL REVERB £1275

INCREDIBLE SOPHISTICATION UNBELIEVABLE PRICE

MIDI Controllable – Totally Programmable – 99s Delay!
Rolands new SRV2000 Digital Reverb offes a unbeatable new market leader in digital reverberation! With the worlds first MIDI controllable unit. Look at these features and compare the competitors price! 24 memories(Parametric EQ control) for room size PRG delay, Gate/Damping, Rev time MIDI+6 intergrated display, stereo output of up to 99 seconds! Many other features!
ORDER NOW FOR JULY DELIVERY

NEW

JX8P TOUCH SENSITIVE POLYSYNTH



Rolands Brand new Digital Analogue Polysynth with optional PG800 Programmer

AVAILABLE NOW

JX8P £1165

NEW

ROLAND DIGITAL DRUM SYSTEM!

State of the Art sounds and performance DDR30 drum module has PCM sound, sophisticated editing+MIDI in and out. All pads natural feel and fully touch sensitive.

£1699

NEW

ROLAND SDE2500 MIDI DIGITAL DELAY

A MIDI controllable Digital Delay with 64 memories.
Available June 1985

NEW

TR707 DIGITAL MIDI RYTHM COMPOSER
TR727 DIGITAL MIDI PERCUSSION COMPOSER

Rolands new TR707 and TR727 continue their fantastic success in low price, high quality rhythm units both units feature real and step time, 69 patterns, MIDI, graphic display independent outputs, memory expansion cartridge. NewTR727 percussion sounds include Bongos, Conga, Timbace, Agog, Cabasa, Maramba, Whistle, Quisada and Tubular Bell!!! **£465**

BOSS MICRO RACK SERIES

Ideal for the home recording freak!
Boss offer the novel concept of effects in a neat 19" rack format (2 per rack)
Range Includes:
RDD-10 Digital Delay £175
RCL-10 Compressor limiter £110
RBF-10 Flanger £110
RPH-10 Phaser £110
RGE-10 Graphic EQ £110

NEW

NEW

ROLANDS NEW SUPERCUBES

Roland introduce a completely new range of their ultra successful compact cubes!!

SCC40 Lead 40W £215
SCC60 Lead 60W £245
SCC60 Lead 100W £329
SCB40 Bass 40W £225
SCB60 Bass 60W £259
SCB100 Bass 100W £319
New JC77!!
2×10" 80W Jazz Chorus £475
ALL AVAILABLE NOW

NEW

BOSS DSD2 DIGITAL SAMPLER/DELAY

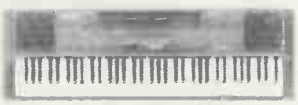
Continuing BOSS's remarkable market domination, The new DSD2 offer the worlds first portable battery powered sampler delay in a compact pedal. Equally versatile as a sampler or delay featuring 200 to 800 milliseconds in sample MIDI with pitch variation and overdub facility! Incredible!!

AVAILABLE JUNE 85

£175

NEW

ROLAND PIANO PLUS 50/100 MIDI ELECTRONIC PIANOS



Rolands New Series of HP100/50 Electronic Pianos offer 4 superb new sounds with the MIDI connection!
76 keys stereo, key transpose, built-in speaker, chorus and with touch sensitivity and MIDI channel program assigns capability make an ideal budget MIDI keyboard controller, as well as piano!
AVAILABLE JULY 85

BOSS MICRO RACK MIDI UNITS

Supporting the MIDI revolution Boss offers a new range of MIDI control units that fit the micro rack standard. Range includes
MI-30 MIDI channel filter/ convertor £199
MI-40 MIDI input selector £65
MI-50 MIDI output selector £85
MI-10 MIDI to CV interface £245
AVAILABLE AUGUST 85

NEW

FUTURE MUSIC

MKB 1000 & MKB 300 MIDI KEYBOARD CONTROLLERS

MPG-80

MKS 10 PLANET P MIDI PIANO MODULE £839

MKS 30 PLANET MIDI POLYSYNTH MODULE

£769

MKS 80 SUPER JUPITER MIDI 8 VOICE MODULE

£1589

MSQ 100 POLYPHONIC MIDI SEQUENCER

Following their success with the world's first MIDI sequencer the MSQ700 Roland now introduce a new budget version packed with features at a price for all

£POA

SBX-80 SYNC BOX

£839

The SBX-80 is an affordable programmable tempo controller that can generate and read SMPTE time code it generates pulse signals controlled by MIDI data, 24-clock DIN signals or SMPTE time code thus the SBX-80 can be used as a master tempo controller for almost all electronic instruments the tempo is controlled by knob or the tap switch on the front panel or by the click signals stored in external equipment not only in time with the metronome rhythms of a drum machine or a sequencer, but also in time with his own rhythm. The SBX-80 can memorize allthe changes of tempo in any composition a display shows all the data required including the tempo value and time synchronization with tape recorder – indispensible for multi-track recording – is achieved using SMPTE time code instead of ordinary FSK tape sync signals in this way. The SBX-80 allows equipment to be synchronized with a tape recorder from the middle of composition. It is also possible to overdub rhythm machine or a sequencer over a composition that is recorded without FSK tape signals.

ROLAND SPECIAL OFFERS

Roland JX8P + PG800	£1395
Roland Juno 106 + headphones + case	£795
Roland JP8 + headphones	£1995
Roland SH101 TMGS1 Handgrip, Case + headphones	£249
DRUM MACHINES	
TR808	£399
TR909	£399
TR707	£495
TR606	£185
CR8000	£POA
CR5000	£POA
DR110	£125
RMK100	£49
SEQUENCERS	
JSQ60	£139
MSQ700	£795
MSQ100	£425
MC202	£199
CSQ600	£199
MC4B + OP8	£699
MC4B + OP8M	£799
CMU800	£99
CMU802	£49
TB303	£POA
AMPS & SPEAKERS	
SST40 Speakers	£149
SST60 Speakers	£175
SST80 Speakers	£225
JC120 Jazz Chorus	£499
JC77 Jazz Chorus	£425
Cube 40	£159
Cube 60	£195
Spirit 25A	£135
Cube 60K	£215
Cube 40CH	£185
Cube 60CH	£225
Supercube 40	£189
Supercube 60	£249
Supercube 100	£329
GUITAR SYNTHS	
G700	£1450
G707	£650
G808	£599
G303	£499
G202	£299
G505	£499
GR300	£349
BOSS PEDAL BARGAINS	
DD2	£135
OR110	£125
CE3	£65
CE2	£65
BF2	£75
DM3	£99
H12	£40
H45	£75
PC2	£40

YAMAHA HI-TECH DEALER–INCREDIBLE NEW PRODUCTS

NEW

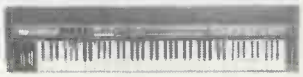
DX5

£2999

Digital programable synthesizer. State of the art performance yet affordable! 76 Key velocity sensitive with aftertouch 16 Note Polyphonic (dual) or 32 note Poly (single) 128 Memories, 6×2 operators 32 Algorythms! Split channels! MIDI 8 parameter digital EQ!

NEW

KX88 REMOTE MIDI KEYBOARD



Yamaha invent the ultimate in midi remote keyboards! Light and portable yet full of features! 88 notes wood keys, beautiful feel! 19 different control effects 192 parameter change possibilities. THE ULTIMATE!

£1399

NEW

QX1 MEGA SEQUENCER!

Incredibly sophisticated state of the art data storage, the most powerful yet!
8 Polyphonic channels, built in disc drive with one megabyte storage (80,000 notes!)
Extremely sophisticated editing.
Best Yet! £2499

NEW

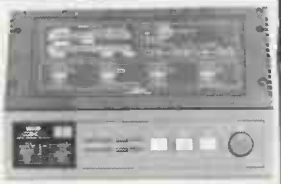
TX816/TX812 FM TONE GENERATOR SYSTEM

£4199

Sytem of the future now! 8 DX7s in a rack creating unbeatable versatility. 32 voices per module indivldual MIDI channel assign.
TX812 ideal starter with two modules and rack expandable with additional TFI modules!

NEW

QX7 DIGITAL SEQUENCE RECORDER

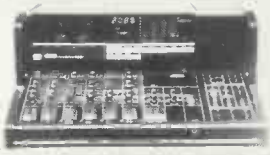


Yamaha continues the fabulous X7 range with an incredibly cheap poly, midi sequencer! 2 track, 16 midi channel sequencing in real or step time! MIDI in and out! Storage! Editing! Just like a multi track but with digital quality! £499

NEW

MT44D 4 TRACK

£799

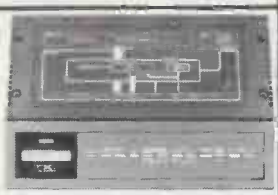


Yamaha have completely redesigned the popular MT44 system with sharp new looks and many new features, LED Display, 6 input mixer new patchbay etc.

NEW

TX7 FM TONE GENERATOR

£699



DX7 half price!!? Almost! All the functions of the worlds best selling synth in a compact keyboard controlled through MIDI! 6 Operators, 16 note polyphonic, 32 memories, LCD display! Low price!

NEW SOFTWARE

CX5M

Yamaha's affordable music computer now with new software! Real time multitrack recorder, 4 track controllable from MIDI keyboard (DX7 etc)!! RX drum machine programer!
Program your RX11 or RX15 with fabulous graphics from a CX5 just like the DX7 cartridge!

£POA

202 NEW KINGS ROAD,
FULHAM, LONDON SW6
OPP. PUTNEY BRIDGE TUBE
TEL: 01-731 5993
01-736 4771

10 BADDOW ROAD,
CHELMSFORD, ESSEX.
TEL: 0245-352490

104-106 ELM GROVE,
SOUTHSEA, PORTSMOUTH
HANTS.
TEL: 0705-820595

85 ST. MARY'S STREET,
SOUTHAMPTON, HANTS.
TEL: 0703-26798

Instant Credit Available.

REV-1 PROFESSIONAL DIGITAL REVERB

Yamaha introduce the world beating REV-1 Digital reverb! 19" Rack mount unit plus multifunction remote control with superb LCD graphics. Max reverb time 99s, 90 memories (30 preset) Packed with features! Simulate any kind of reverberation system characteristic!

ON DEMO NOW!
£POA

REV-7 PROFESSIONAL DIGITAL REVERB WITH MIDI

Yamaha break the price performance barrier with the brandnew REV-7! 19" rack mount unit with remote simulates any reverb characteristic! New LSI chips give up to 15 early reflections and 99.9 milliseconds of initial delay. Parametric Eq. MIDI, 30× presets, stereo, 60 user memories!!!

DX7

The worlds best selling synth now even more versatile with the new QX7, TX7 modules!

RX11 RX15

Now programmable from a CX5 with superb graphics, and controllable through MIDI. Real and step time fabulous digital sound quality.
RX11 has individual outputs and cartridge memory expansion.

YAMAHA PA – GUITARS – AMPS – DRUMS

YAMAHA GUITARS

NEW ELECTRIC/ACOUSTICS

FNS75E	£299.00
FNS95E	£349.00
CN525 classic	£299.00

NEW ELECTRICS

New SE200 3pu	£169.00
New SE300 w/trem	£199.00
SG1300TS trem/lock nut	£539.00
SE700HE Humbuckers	£429.00

NEW BASSES

BB1100s Active EQ	£399.00
BB300	£199.00
BB400 SF Fretless	£279.00
BB3000	£699.00

YAMAHA DRUMS

Series 9000 standard sizes now also available in powertom and new finishes. In Stock!
Series 5000 also now available in Powertom. In Stock!

YAMAHA PA

The new compact high powered S250 speaker system comprising of the S250X full range cabinet, 250w handling with carbon fibre cones and high frequency compression driver and horn.
The S250G is a high powered bass which when used in conjunction with the S25xs give a full range system capable of handling 1100 watts.

S250X £399.00 each S250S £499.00 each

CALL IN FOR FULL DEMONSTRATION

YAMAHA SPECIAL OFFERS

MT44 MULTITRACK RECORDER	£499
CS01 PORTABLE SYNTH	£99
PF10 DIGITAL ELECTRONIC PIANO	£499
R1000 DIGITAL REVERB	£499
MR10 DRUM MACHINE	£69
KX5 MIDI REMOTE KEYBOARD	£295
CX5M (Free YK01 K/bd & S/ware)	£POA
RX11 DIGITAL DRUM MACHINE	£699
RX15 DIGITAL DRUM MACHINE	£499

NEW

ensoniq

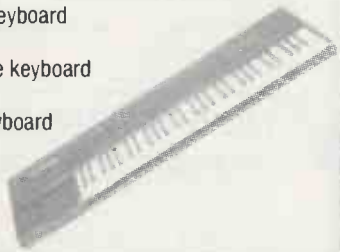
MIRAGE

COMING SOON! THE SOUND SENSATION OF 85!! INCREDIBLE BIG FEATURES! SUPER PRICE £1695

Ensoniq introduce the Mirage the first integral touch sensitive sound sampler at a realistic price!

Look at these features:

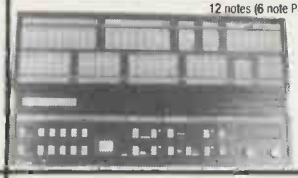
- ★ Five octave velocity sensitive keyboard
- ★ 8 voice polyphonic
- ★ 16 different samples across the keyboard
- ★ Up to 8 second samples
- ★ 4 user samples split across keyboard
- ★ On board MIDI sequencer
- ★ On board 3.3" floppy disk drive
- ★ 4 sounds per disk
- ★ MIDI in/out



SIEL

SIEL DK80 DYNAMIC POLYSYNTH

Introduce a brand new Touch Sensitive Polysynth at the incredible low price of £699
Look at these features!
12 notes (6 note Poly) Dynamic Keyboard. Built-in 2 track real time Poly MIDI sequencer!
150 programs, stereo advanced MIDI



SIEL MIDI EXPANDER 80

19" rack 8 voice 50 memories, RAM & ROM extensions + 300 note Polysequences on board!

£399

KORG

DW6000 PROGRAMMABLE DIGITAL WAVEFORM SYNTHESIZER

A digital synthesizer that responds like a musical instrument! Korgs new DW6000 offers advanced digital sound quality with easy to use analog processing and control!! + MIDI interface. Look at these features! 6 voice 69 memories complete sound generation through harmonics synthesizer encoded in 2×256 ROM chips. 2 oscillators with 8 waveforms each.

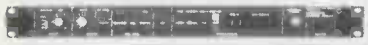
£999

SDD2000 DIGITAL SAMPLER/DELAY

Korg introduce a new rackmount effect for the exciting new world of sound sampling! and it's controllable from a polyphonic MIDI keyboard! Sampling at last affordable!

4368MSEC in both DECA-1 sample mode make sequencing as well as single note sampling and digital delay possible with 64 memories transposable through MIDI!

£699



MR-16 MIDI RHYTHM UNIT

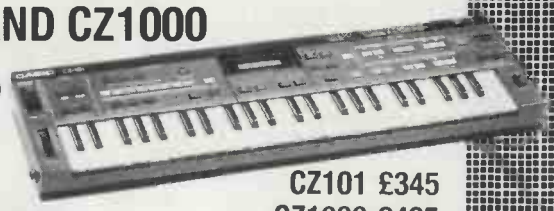
The answer! Digital drum sounds controllable through MIDI at new low price! 19 high quality PCM recordings triggered by MIDI keyboard, drum machine, sequencer etc!!

£POA

CASIO

CZ101 AND CZ1000

Casio's world beating CZ1000 now available with full size keys



CZ101 £345
CZ1000 £495

SZ1 DIGITAL SEQUENCER

Real or step time
MIDI, RAM cartridge
4 track 1800 notes

£345

FUTURE MUSIC

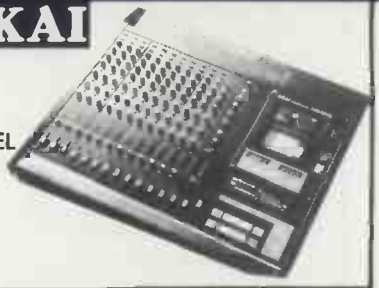
NEW

AKAI

AKAI MG1212

THE INCREDIBLE 12 CHANNEL MIXER RECORDER ON ½" CASSETTE TAPE

£5999



NEW

AKAI MIDI DIGITAL SAMPLER AND QUICK DISK

S612 MIDI DIGITAL SAMPLER

£POA

NEW

AKAI AX80 8 VOICE TOUCH SENSITIVE POLYSYNTH WITH NEW SOUNDS AND THE INCREDIBLE LOW PRICE OF £999

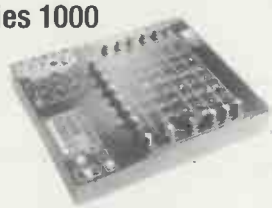
SIMMONS

FANTASTIC NEW PRODUCTS FROM THE WORLDS LEADERS IN ELECTRONIC PERCUSSION!

SDS9 **COMPLETELY REDESIGNED 5 PIECE KIT WITH MANY NEW FEATURES**

★ Snare drum has two pick-ups gives rim shot on cross stick as well as 3 digital snare sounds
★ MIDI in and out

SDS series 1000
SDS200
SDS400
SDS800



Add a Simmons system to your kit! Now with SDS Series 800 you can add a 4 piece kit at fabulous affordable prices.

SDS64 All new software for programming Simmons from Commodore 64 into trigger inputs terrific graphics.

£59

ALSO IN STOCK

SDS1
Simmons digital drum complete with choice of EPROM £249 Library sounds £24

SDS7
The worlds leading digital drum synth complete with stands with free BD pedal of your choice £1995

SDS8
Simmons on a budget: the popular kit at low price and the exclusive Simmons sound £595

SDSEPB
Simmons revolutional digital sound sampler for SDS1 and SDS7 £390
6 pack EPROM £99
Eraser £39

FOSTEX

FOSTEX B16

Join the personal multitrack revolution of Future Musics 16 track package deals! The worlds incredible successful 16 track ½" recorder with Dolby C with a choice of 8 fabulous mixer/package with enough features for the most discerning pro!

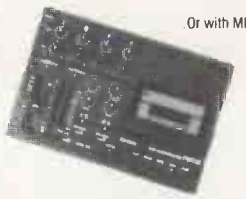
FOSTEX X15

The portable multitrack phenomenen!! Now available with free power supply

£299!

Or with MN15+PSU

£335!!



Fostex A8 8 track 14" tape, Dolby C, complete with 350 mixer & 3060 meter bridge

£1799

plus free Roland CMU802 tape sync unit – worth £100

FOSTEX 250

Multi tracker. Still the best four track cassette system at a price you can afford. Phone for details or call in for a demo. **£POA**

FOSTEX B16+RAM MEGA GREAT COMBINATION £5295	**FOSTEX B16+AHB SYSTEM 8 AHB: MOST SUCCESSFUL MIXER £5335**
FOSTEX B16+DYNAMIX 24/8/16 BEST VALUE SYSTEM £4950	**FOSTEX B16+CMC24 LATEST COMPUTER MIXER £5995**
FOSTEX B16+SOUNDTRACKS MOST POPULAR COMBINATION £5650	**FOSTEX B16+RSD 16/16/2 EXCELLENT FACILITIES £5295**
FOSTEX B16+SECK 18/8/2 NEW SECK MIXER SET TO BE A WINNER £4965	**FOSTEX B16+SOUNDCRAFT FOR THE PROFESSIONAL £6999**

Accessit

ACCESSIT

STILL THE BEST VALUE IN BUDGET SIGNAL PROCESSORS

COMPRESSOR.....£52.00
NOISE GATE.....£52.00
DUAL SWEEP EQ.....£52.00
STEREO REVERB.....£132.00
FOUR WAY PSU.....£33.00
SINGLE PSU.....£8.00

RACK MOUNT KITS AVAILABLE
STUDIO/DISPLAY RACKS FROM £65.00
FULL RANGE OF TANNOY MONITORS AND QUAD POWER AMPS IN STOCK

202 NEW KINGS ROAD,
FULHAM, LONDON SW6
OPP. PUTNEY BRIDGE TUBE
TEL: 01-731 5993
01-736 4771

10 BADDOW ROAD,
CHELMSFORD, ESSEX.
TEL: 0245-352490

104-106 ELM GROVE,
SOUTHSEA, PORTSMOUTH,
HANTS.
TEL: 0705-820595

85 ST. MARY'S STREET,
SOUTHAMPTON, HANTS
TEL: 0703-26798

Instant Credit Available.

HOME RECORDING & PERSONAL MULTITRACK

★ FOSTEX ★ REVOX ★ AKAI ★ YAMAHA ★ SECK ★ RAM ★ SOUNDTRACS ★ ALLEN & HEATH ★

RECORDERS
FOSTEX X15 ..... £299.00
FOSTEX 250 ..... £720.00
FOSTEX A8 ..... £1375.00
FOSTEX B16 ..... £4,000.00
YAMAHA MT44D £399.00
AKAI MG1212 ..... £5399.00

MIXERS
DYNAMIX 16:8:2 ..... £995.00
RAM RM10 ..... £499.00
FOSTEX ⅓50 ..... £535.00
ACES 10:8:2 ..... £399.00
AHB 16:8:2 ..... £1595.00
AHB CMC 24 ..... £2750.00

SOUNDTRACS 16:8:16 £2385.00
YAMAHA RM602 ..... £249.00
SECK 18:8:2 ..... £1493.00

MONITORS
TANNOY Stafford £145.00
TANNOY Oxford £225.00
YAMAHA Ns10 ..... £199.00
YAMAHA S10X £69.00
YAMAHA S20X £110.00

POWER AMPS
QUAD 303 ..... £179.00
QUAD 405 ..... £269.00
ROLAND SRA1200 ..... £399.00

ROLAND SRA2400 £725.00
ROLAND SRA4800 ..... £1450

DIGITAL REVERB
YAMAHA Rev 1 ..... £POA
YAMAHA R1000 ..... £475.00
ROLAND SRV2000 £1425.00

SPRING REVERB
Gt British Spring £229.00
ACCESSIT Stereo Rev £132.00
FOSTEX 3180 Stereo £340.00
BOSS RX100 ..... £125.00

NOISE GATES
ACCESSIT Noist Gate £52.00

DRAWMER Noise Gate £335.00

COMPRESSOR/LIMITERS
DRAWMER Compressor Limiter £395.00
FOSTEX 3070 comp/MM £249.00
YAMAHA CG2020 .... £229.00
ACCESSIT Compressor £52.00

DIGITAL DELAYS
ROLAND SDE3000 £795.00
ROLAND SDE1000 £395.00
ROLAND SDE25000 MIDI £585.00

YAMAHA D1500 MIDI £550.00
BOSS DE200 ..... £275.00
BOSS CE300 CHORUS £230.00
IBANEZ HD1000 ..... £325.00

GRAPHIC EQ
FOSTEX Dual 10 band £199.00
ROLAND SEQ331 31 band £345.00
ROLAND SEQ315 2×15 band £395.00
YAMAHA Q2031 2×31 band £399.00

YAMAHA CQ1031 31 band £229.00

MICROPHONES
AUDIO TECHNICA BEYER AKG ELECTROVOICE — CALL FOR PRICES

TAPE SYNC
ROLAND CHU802 Tape sync £49.00
ROLAND SBX80 Sync box £895.00
SYNC 24, MIDI, SMPTE

★ TANNOY ★ JBL ★ QUAD ★ ACCESSIT ★ BOSS ★ ROLAND ★ DRAWMER ★ BEYER ★ AKG ★

FUTURE MUSIC SUPERSTORES!!!

SYNTHESIZERS	GUITARS
YAMAHA – KORG ROLAND – CASIO SEQUENTIAL	YAMAHA – IBANEZ ARIA – WESTONE FENDER
AMPLIFIERS	**ELECTRONIC DRUMS**
CARLSBRO – ROLAND FENDER – YAMAHA	YAMAHA – ROLAND SIMMONS – DELTA ULTIMATE
DRUMS	**CYMBALS**
SONOR – YAMAHA PEARL – TAMA PREMIER – TRAK	PAISTE – SABIAN PEARL – ZANKI ZILDJIAN

Delta

DIGITAL INTERFACES

Delta Drum DD8 MIDI drum interface convert your MIDI drum machine to be triggered by accoustic drums or pad! Each pad or pick-up available in any MIDI channel!! Price £399

Delta pads DP4 set of 4 pads £99

Pick up from: SX301 digital delay/sampler conversion £89

SX303 convert your digital delay In to a sampler with pitch control 1 volt per oct £129

XX305 sampler with converter with MIDI input £POA

Now you can buy digital delays with sound & sampling hardware fitted and off the shelf!! At very attractive prices. LOOK.

Roland SOE1000 ..... £POA
Roland SDE3000 ..... £POA
BOSS DM300 ..... £POA
YAMAHA D1500 ..... £POA
IBANEZ ..... £POA
Call for further Info!

GREENGATE

DS3 POLYPHONIC DIGITAL SOUND SAMPLER

Incredible price breakthrough sound sample board for Apple IIE only £250 with digital scan 4 poly keyboard £550+VAT.

Complete Apple IIE system, Apple IIE + 2 drives, cards, keyboard and software £1400+VAT.

New looping software in stock.

FOR DELIVERY CHARGES PLEASE PHONE FOR QUOTATION

Address

Please send me the following goods

Telephone No.

Signature

Please send me details on the following goods (enclose a large

EMM 185

COMPLIMENTARY TICKET

ADMIT MANY

OVER THE ROAD SHOW

June 12, 13, 14

VENUE: TARA HOTEL, SCARSDALE PLACE, KENSINGTON

(Just round the corner from APRS)

Come and try equipment by: Aiwa, Aphex, Applied Microsystems, Bel, Fostex, Lexicon, Mordaunt-Short, MXR, Quad, Rauch, Rebis, Simmons, Soundcraft, Soundtracs, Standeasy, Studer/Revox, Tannoy, TC Electronics, Trident, Westlake and Yamaha.

Don Larking
audio sales

Luton: 29 Guildford Street, Luton, Beds.
Telephone: Luton (0582) 450066
Telex: 825488 DONLAR G

Stoke-on-Trent: Stofford House,
Clough Street, Hanley, Stoke-on-Trent.
Telephone: Stoke-on-Trent (0782) 24257

BACK TO BASICS

We continue our beginner's guide to synth programming with an explanation of what an LFO is and what it does. *Steve Howell*

So, *Back to Basics* has now helped demystify the theory that lies behind how an analogue synthesiser generates its pitch, and how it's possible to manipulate tone and amplitude shapes using the component parts that make up a synth's processing circuitry. But if you've been following the series with one hand on the magazine and the other on the keyboard, you'll have realised that most of the sound possibilities we've discussed so far have been a little on the static side.

Now, this wouldn't be a problem if it weren't for the fact that many acoustic sounds rely heavily on pitch and tonal fluctuations for their sonic interest. They're the components that do the most to animate acoustic sounds, and without them, synthesised voices aren't going to stand much of a chance in their attempts to appeal to the human ear. Which is why we're dedicating this month's instalment to the job of creating precisely those variations.

The synth module that's relied on most to perform these tasks is the Low Frequency Oscillator, a humble-looking device that's fitted to almost all modern-day synths, analogue or digital. Electronically, its purpose is to provide cyclic modulation effects of one form or another by generating rising and falling voltages. And as a glance at Figure 1 will tell you, the LFO is a free-standing device that does nothing more than generate various waveforms at subsonic frequencies that normally fall in the range between 0.1Hz (one cycle every 10 seconds) and 30Hz (30 cycles per second), though this can vary widely depending on the synth's manufacturing origins. Whatever its range, though, the LFO's function is the same – to provide modulation. Which is why Korg call their LFOs 'Modulation Generators'. Simple, really.

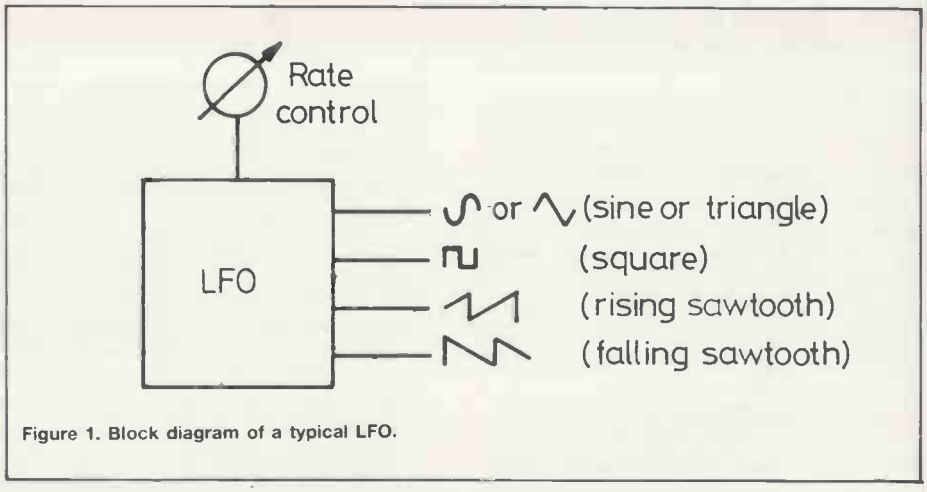


Figure 1. Block diagram of a typical LFO.

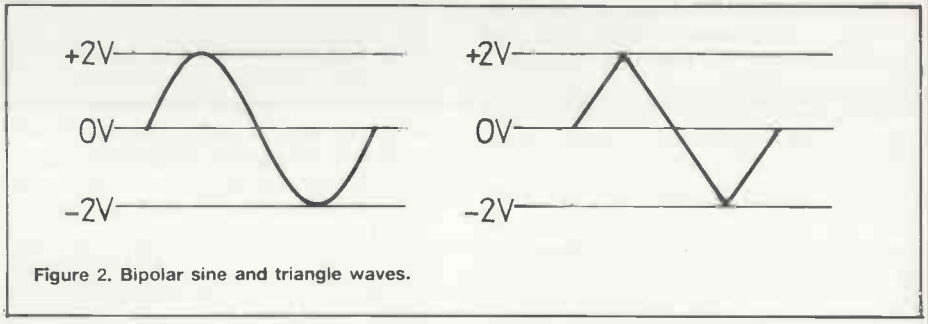


Figure 2. Bipolar sine and triangle waves.

The Wave Factor

Although LFO waveforms *look* much the same as those generated by VCOs, they are in fact crucially different in that they're simply graphic representations of the way a voltage rises and falls. It's easiest to think of them as voltage 'shapes' similar to those that appear at an Envelope Generator's output, the only difference between the two being that whereas the EG's is a one-shot voltage that only exists on receipt of an incoming pulse, the LFO's voltage is a repetitive one.

The various common LFO waveshapes each have their own specific uses. Triangles are good for smoothly undulating sweeps of pitch or tone, Square waves are useful for providing automatic octave jumps and sequencer mimmicking effects (as are the subjectively smoother sinewaves that are often found in their stead), while sawtooths, in either of their rising and falling variations (some synths have both), tend to be used for effects that can be most diplomatically described as 'off the wall'.

However, getting hold of the effect you're after isn't just a question of finding a synth that has an LFO with the right waveform and then bringing it into play. Because the waveform's speed and modulation level have just as big a part to play as the waveshape itself. Vibrato effects, for example, require a sine or triangle wave set at around 5-8Hz and a fairly low modulation level. Too low a speed and you'll end up with a siren, too high a mod level and your ears will be assaulted with something not dissimilar to the sound of a *Star Wars* zap gun.

In fact, the inherent flexibility of the LFO makes it well-nigh impossible to give a comprehensive breakdown of the settings that suit particular sets of sounds, so experience will make you the best judge of what's needed for a specific programming job.

The Age Factor

Classifying LFOs isn't that straightforward, however, because their waveforms behave differently depending on who designed the synth in question and when it was manufactured. The heart of the matter is the module's voltage output and how it alters with time, as we'll see.

Most of the voltages generated within a synthesiser start at a value of zero and move upwards in time to a positive value. The EG is a fine example of this, as we saw last month. But LFOs are the exception, in that some of their waveforms' voltages 'rotate' around 0V, going negative for one half of the cycle and positive for the other.

As Figure 2 should indicate, the sine and triangle waveshapes do just that. Now, whether or not manufacturers ever designed their LFOs to work this way intentionally is something of a moot point, but the principle has some foundation in the field of acoustic instruments. If, for instance, you were to look at a violinist's vibrato technique, you'd see it comprises revolving the pitch around the note being played at the time, an action replicated extremely well by a sine or triangle LFO wave being applied to the voltage input of a VCO. Some acoustic instruments aren't capable of true pitch vibrato, but can be used to create tremolo (a cyclic variation in tone and/or amplitude) instead. And again, this effect can be replicated by a sine or triangle LFO waveform. How? Well, applying a bipolar voltage to the CV input of a VCF and/or VCA is an action very similar in principle to, say, tone and ▷

amplitude variations on a flute revolving around an average level.

But if sine and triangle LFO waveforms are so good at recreating vibrato and tremolo effects, what do the alternative shapes do, and how? Well, the answer to this one is also complicated by the influence of history. In the past, manufacturers saw fit to make LFO square wave outputs jump between 0V and a positive value, creating a waveform we call, for convenience, 'unipolar'. As I've said, such a waveform is useful for creating note-jumps of various musical intervals, but what's important here is that the pitch of the note you play remains true at all times, with the interval jump tracking that note perfectly. This is a direct result of the square wave cycle's lower half being at zero volts, because (not unexpectedly) adding 0V to the voltage mixer of a synth's VCO makes no difference to its output, while adding a positive value during the upper half of the cycle results in the required interval jump.

But like I say, that was in the past. More recently, synth manufacturers have started incorporating bipolar square waves into their LFOs instead; a typical example of the new breed is shown in graphic form in Figure 3. Frankly, I can't help but wonder exactly why this new format has been implemented so widely, as it's not nearly as useful from a musical point of view. Cost has probably been the critical factor, I guess.

Why aren't the bipolars useful? Well, the crux of the matter is that if you modulate a VCO with one, the lower level of the interval becomes lower than the note you're actually playing on the keyboard. Which isn't, all in all, a particularly useful (or indeed musical) effect to have at your disposal.

Much the same argument applies to sawtooth waveshapes as well, even if the sounds they produce aren't necessarily affected by waveform polarity. Go for a unipolar variant if you can find one, but recent design trends might make the task difficult to accomplish.

The Option Factor

So much for LFO basics. One point worth bearing in mind is that synth manufacturers have seen fit to incorporate a number of extra facilities into their designs as the years have gone by, and one of the most common is the trigger sync facility. What this option involves is routing the keyboard's trigger or gate output to a reset input on the LFO, so that every time you play a new note on the keyboard, you automatically reset the LFO waveform to the front edge of its cycle (see Figure 4). And although this is a facility of somewhat questionable usefulness, it does at least mean that square wave octave jumps (say) will always be in time with your playing.

There are problems with trigger syncing, though. Let's say you wanted to set up a slow, undulating filter sweep using a sine or triangle wave. With trigger syncing, each new note played would reset the LFO, and the end result would be more akin to an EG sweep rather than anything else – not a happy state of affairs. Unfortunately, there are gaps in the Howell Knowledge of Synthesiser Specifications, and I can't say off-hand which models feature LFO trigger syncing and which don't. Try before you buy.

A further option, and one you'll find on almost all of today's polysynths, is delayed modulation. Basically, this allows you to execute a gradual fade-in of vibrato automatically, with the Delay Time control being used for precise adjustment of that parameter. Figure 5(a) sheds the light. You'll see that the LFO's output is routed to a VCA, whose output level is controlled by an EG. The EG's attack time is effectively the delay time, because the VCA's output level increases as the EG voltage increases, and .Hey Presto, the LFO's waveform is gradually faded into whichever bit of the synth's internals it's been connected to.

But again, things aren't problem-free. The release time of the EG in question is always set to minimum, which means that the vibrato disappears as soon as you take your fingers off the keyboard; something that can be a bit disconcerting if your envelope-shaping EGs are set fairly long.

However, a variation on the delayed vibrato theme has been developed in an attempt to overcome just this problem. Figure 5(b) shows the layout of a typical 'present-day' delayed modulation patch. In it, an EG is routed through an inverter that turns its voltage upside down, so that when a note is pressed, the output shoots down from 0V to a negative voltage, and the decay/release envelope portion starts to enter the proceedings. With the attack time in this example set to instant, it's the decay/release time that sets the vibrato delay. The decay and release portions are tied together so that if you keep your fingers down on the keyboard, the modulation fades in. Likewise, if you just stab at the keyboard using a sound with a long release time, you'll still hear the modulation increasing even as the sound fades away.

Obviously, the latter system is the more flexible, and you shouldn't experience too many difficulties tracking down a synth that's equipped with it.

It's also worth noting that a lot of models equipped with a delayed modulation facility also have a Delay Reset option, so that each new note played retriggers the LFO's inverted EG. This makes good sense on a monophonic synthesiser, but causes the odd hiccup or two when applied to polysynths. Why? Because it means that every new note you play over a chord starts the delay cycle all over again, and as a result, the chord you're holding is robbed of its modulation as soon as a new note arrives. The alternative is to give the new note instantaneous – rather than delayed – modulation. Unfortunately, on all but the most expensive polysynths that have a separate LFO for every voice, there exists only an either/or situation.

The Touch Factor

Nowadays, of course, you can introduce modulation manually by applying extra keyboard pressure, in addition to implementing it automatically through electronics.

The theory behind this is actually quite simple. The LFO's output is again fed to its destination *via* a VCA, the output level of which is controlled by a second

Figure 3. Comparison of unipolar and bipolar square waves set at the same modulation level.

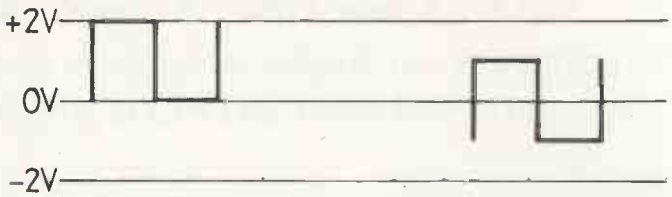
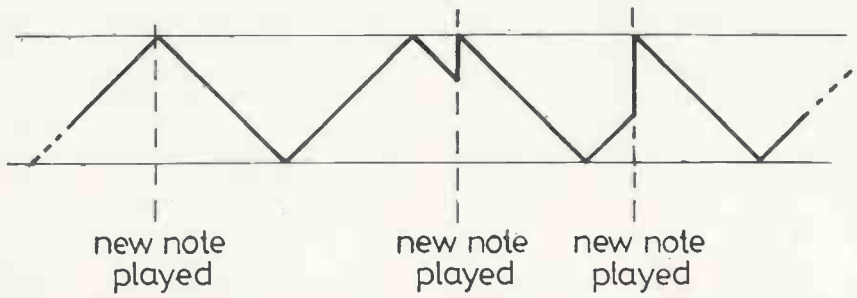


Figure 4. The effect of resetting an LFO's output with a sync input trigger.



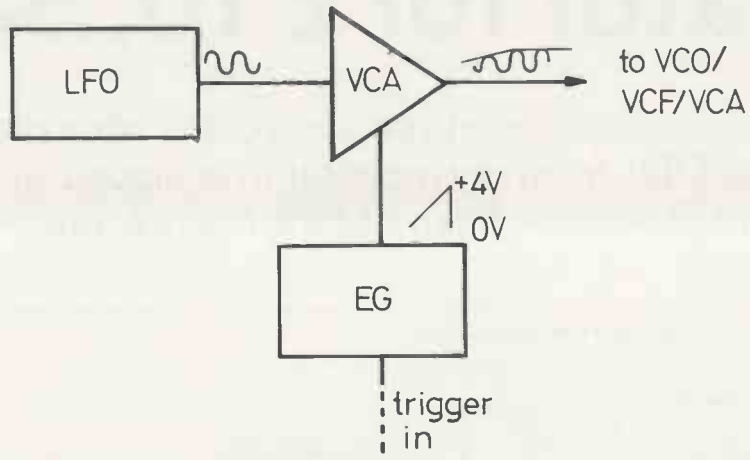


Figure 5(a). 'Traditional' delayed vibrato patch.

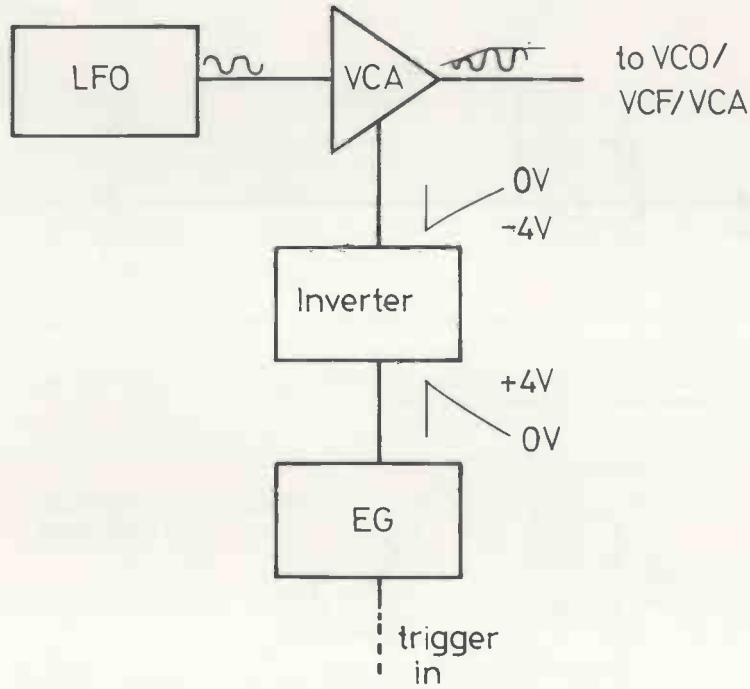


Figure 5(b). 'Present-day' delayed vibrato patch.

Figure 6. Two examples of the output from a VCLFO being voltage-controlled from another synth module.

Sawtooth output of an LFO swept with an EG...very Jean-Michel Jarre!

Triangle wave output of an LFO swept with a second low-frequency triangle wave.

voltage derived from pressure sensors mounted on the keys. The harder you press the keyboard, the higher that secondary voltage becomes, and the greater the proportion of the LFO's output is passed through the VCA. And as if by magic, more modulation makes itself apparent.

Still, a simple theory doesn't always mean an equally straightforward execution, and the circuitry for this particular function is a bit on the complex side, not to mention expensive too. Thankfully, recent technological advances have made velocity-sensitivity easier and cheaper to implement, and I can't see it being too long before it becomes *de rigeur* for any decent, self-respecting polysynth. And that's got to be good news for musicians.

Moving on to a slightly more obscure variation (obscure in that it's confined to modular synths and the odd overdraft-inducing poly), we come to LFOs that can be modulated by an external control source. The golden rule with these is that the higher the incoming voltage, the greater the LFO speed will be. It's good for special effects but not much else.

Then again, while the VCLFO may not be the most commonly found synthetic device, a larger number of instruments do feature a VCO that can be adjusted to perform the function of LFO, which can then, of course, be voltage-controlled. Figure 6 shows some of the control voltage waveforms that can be created using just such a technique, which should in turn give you some idea of the sort of effects possible.

Lastly, we come to the vexed question of exactly how many LFOs are actually desirable on a modern synthesiser. It's pretty clear to me that a single-LFO set-up isn't going to give you much in the way of inherent versatility. If you want a slow, sinister filter sweep, you have to forego that nifty bit of fast vibrato you've just set up – which is a bit of a shame, all things considered.

Luckily, dual LFOs are now the rule rather than the exception, though in a number of cases, the second oscillator is nothing more than a triangle or sine wave generator. If you can stretch to it, the ultimate source of LFOs is probably Oberheim's Xpander, which has no fewer than 31 of the little beasts.

Well, that's about it for the Low Frequency Oscillator, though I for one didn't imagine such a simple device would take such a lot of explaining. The way I see it, no amount of journalistic meandering is going to tell you all you need to know about it, so I'll stress the point yet again that nothing beats hands-on experience. After all, plenty of acoustic instrument players spend years perfecting their modulation technique – so why shouldn't synth players?

I know it may seem easy just to add a bit of vibrato here and there, but there's a lot more to LFOs than that. Just compare the modulation styles of Jan Hammer and Vangelis to see (and hear) what I mean... ■

BUILD IT

An Emulator for £10...

Well, not quite. But this mini-project does let you control the pitch of a sound frozen inside a Powertran DDL from any monosynth equipped with a trigger output, and there's a PCB available from E&MM. *Patrick Shipsey*

PCB on rear panel, as seen from inside.

Not being able to afford the sophistication of Powertran's MCS1 MIDI Controlled Sampler, I was once faced with the prospect of not being able to do very much with the sounds I could store in the memory of the same company's 'conventional' DDL. Sure, the built-in Freeze function was useful, but what fun I could have if only I could figure out a way of controlling the pitch of the frozen sound from a keyboard. Well, now I can. And if you're afflicted with the same problem and not averse to getting the soldering iron out from the cupboard under the stairs, you'll be able to as well.

Basically, the modifications I'm about to discuss make it possible for frozen sounds to track the pitch of an external instrument (probably a monosynth, though it could conceivably be something more exotic). They also include an external trigger input, which works from a zero to +5V trigger pulse, but could no doubt be converted to operate from an S-trigger. Both external trigger and oscillator can be switched in or out at any time, and with each of them out of the way, the DDL performs as usual.

The really good news is that making said modifications doesn't involve removing the Powertran's main PCB, as all wires are soldered either to PCB tracks on the top of the board or to IC legs bent out from under the protective body of their associated chip.

And there's more. The mod will work on the minimum amount of memory (4K), so it isn't even necessary to have all the memory fitted to your DDL before commencing work on this project (though this would still be an advantage). However, I'll be assuming throughout the piece that you have access to the original DDL circuit diagram – the technical description won't make a lot of sense if you haven't...

As for prototype development, I've successfully fitted the modifications to both my own DDL and that of a friend, and didn't encounter any problems in doing so. A second friend (I'm just *so* popular) has managed to fit the frequency-tracking part of the circuit to a Boss DE200, too. Even E&MM's Technical Editor built one, and his worked first time.

Sound quality has been nothing short of remarkable, and I've had endless fun mucking about with the usual sampling clichés like human voice 'aahs' and slapped bass sounds. And all for well under a tenner, PCB and DDL excluded.

Figure 1. Circuit diagram of trigger section.

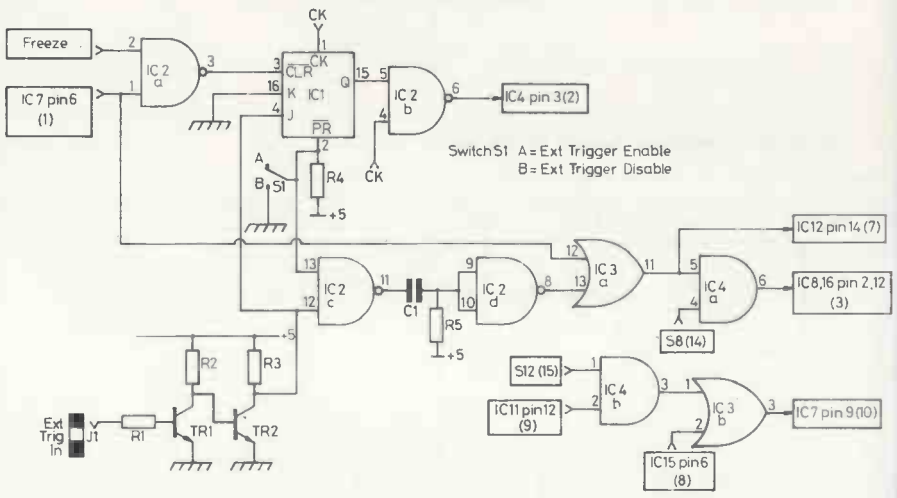
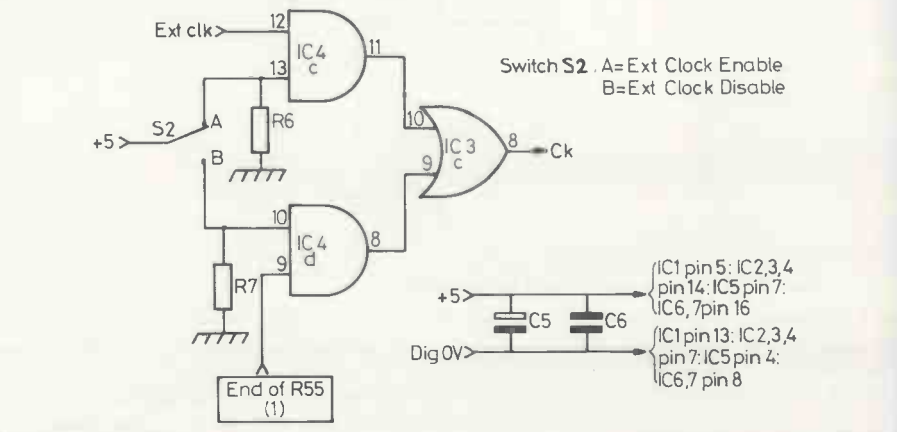


Figure 2. Circuit diagram of clock select section.



Building It

The PCB layout shown in Figure 6 should result in something a good bit neater than my veroboard prototype will ever be, and the component overlay isn't too densely packed, so there should be no soldering problems to speak cf. You're best off using IC sockets for the two CMOS chips, IC6 and IC7, and I'd also suggest inserting the components in the following order: PCB wire links, IC sockets, resistors, capacitors, and finally the two transistors. Chances are your jack sockets will be of the solder lug variety, in which case you'll have to use short wire links to mount them on the board. And make sure they're fairly sturdy, as they're all that supports the PCB once it's been fitted inside the delay unit's case.

THE CAMBRIDGE ROCK SHOP

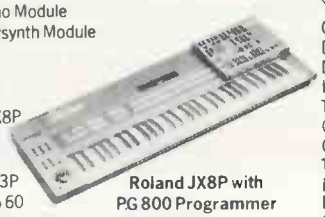
8 Burleigh Street Cambridge Tel: (0223) 316091/65093 Next to the new Grafton Shopping Centre

KEYBOARDS

Roland
WE DESIGN THE FUTURE

Just about the fastest selling range of keyboards on the market today – You can't lose with Roland.

Mother Keyboard System
MKB 300 MIDI Keyboard
MKB 1000 MIDI Keyboard
MKS 10 Planet P MIDI Piano Module
MKS 30 Planet S MIDI Polysynth Module
Juno 106 MIDI Polysynth
JX3P MIDI Polysynth
JX8P MIDI Polysynth
PG 800 Programmer for JX8P
SH101 Monosynth
MC202 Microcomposer
PG200 Programmer for JX3P
JSQ60 Sequencer for Juno 60
MSQ100 Sequencer
RS09 Strings



Roland JX8P with PG 800 Programmer

CASIO.
Casio have at last entered the Professional Keyboard market with the CZ101 & CZ1000 MIDI Synths. Excellent sounds at very low cost. Come and give them a try.

KORG
We always have the best products from Korg in stock. The NEW DW-6000 programmable Digital Waveform Synthesizer with MIDI is now in stock. Plus, Poly 800 (MIDI) Synth, EX800 (MIDI) Expander, MPK-130 (MIDI) Pedal Keyboard.

SEQUENTIAL CIRCUITS INC
New low prices
The Sixtrak & Drumtraks

YAMAHA
HI-TECH DEALER

CX5ME MIDI Computer with "built in" DX9
DX5 Digital FM Synth (MIDI)
DX7 Digital FM Synth (MIDI)
KX5 Remote Keyboard (MIDI)
TX7 Expander (MIDI)
QX7 Sequencer (MIDI)
QX1 Sequencer (MIDI)
TX8 16 Voice Generator (MIDI)
PF10 & PF15 FM Pianos
D1500 MIDI Digital Delay £499
R1000 MIDI Digital Reverb £399
RX15 & RX11 Digital MIDI Drum Machines

SPECIAL PF10 Piano £499
CP70 B £2499
FREE Mini Keyboard with every CX5 ME Computer

AKAI
Akai have entered the market with some blistering products not least the AX-80 MIDI Synthesizer. Now in stock. £999

The BIT ONE £799
Polyphonic • 6 Voice • Touch Sensitive • Digital and Analogue

GUITARS & BASSES

Fender USA
Your last chance to purchase a new all American Fender at an affordable price. We have managed to secure the last of the U.S.A. standard guitars as all future Fenders in this price range are now being manufactured in Japan. How much, therefore, will these guitars be worth in a few years time? Invest now! from £299

Squier vintage
These now famous guitars have been discontinued due to the re-organisation at Fender and the replacements for this quality of guitar are now a lot more expensive. Again we have managed to secure the last of this superb range at prices that can only be regarded as a 'SNIP!'
£189 · £199 · £209 · Basses £149

Fender JAPAN
This all new range of Fender products are now in stock at very competitive prices. Come and see the dawn of a new era!

YAMAHA 30% OFF!
We are offering 30% OFF stocks of current guitars and basses, eg
SG 1300 T £379 (with case)
BB 1600 £299 Plus Many Others

Tokai
CLASSIC RE-ISSUES
These amazing replicas have caused quite a stir, not surprisingly when you consider you get a mid fifties and early sixties replica for the price of a copy. We carry all the models that upset the Americans – come and see why.

Status
Superb clarity and sustain · One piece carbon graphite central neck · Phenolic fingerboard (harder than Ebony) · Solid brass precision machined bridge assembly · Active EQ · Heavy duty custom case ·

Wal
The Sound of Electric Wood
Beautiful British Basses.

Jay Dee
Mark King and Roadie Models in stock.

Wilkes
Fretless and half fretted handmade British basses.

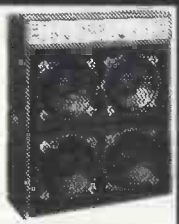
Aria Pro II · ESP · Kramer · Westone · WASHBURN · Ibanez

AMPS & PA's

Fender
Amazing deals on the last of the USA valve amps, eg Twin Reverb £499, Twin Reverb Top £299. Deluxe Reverb EV £315, Concert 4 × 10 £369, Concert 2 × 10 EV £399 plus others.

CARLSBRO
MAIN DEALER
We stock the full range of this British made gear at discounted prices. The new Taurus Series of High Performance P.A. Cabinets Systems arriving soon.

TRACE ELLIOT
We are the sole agents for the Cambs area for this superb British Made product which has been called the 'Rolls Royce' of bass amplification. Please ring us for latest stock position and prices or call in for demo. The new AH500X + AH350X now in.



SESSION
SESSIONETTE LEAD & BASS COMBOS
These incredible little British made amplifiers are always in stock at the best prices around.

MAIL ORDER

We can supply almost any product by our efficient mail order service. **Barclaycard** and **Access** sales can be conducted over the phone. Bank drafts, Building Society cheques and Postal Orders have immediate clearance while personal cheques will take 5 working days to clear before goods can be sent.

TELEPHONE SALES
(0223) 316091

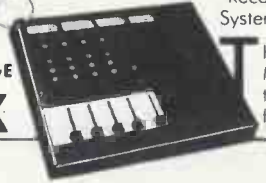
HOME RECORDING

TEAC TASCAM
TASCAM 38 "SUPER DEAL"

New Mini Studio £429 inc mains adaptor and P&P
244 Portastudio at £699.00.

FOSTEX A8/350 8 TRACK PACKAGE
FOSTEX

Fostex X15
ONLY £279
+ Free carry case.



The skilful packaging of the Fostex 250 Multitracker brings together a four track recorder and a frills free, four in, five buss mixer £699

DRUM MACHINES

We carry a comprehensive range of Drum machines and Rhythm units including **Yamaha RX15 and RX11, Roland TR606, TR909, TR707 and TR727, Boss DR110, Korg KPR77, Soundmaster SR88, Soundmaster Stix, M.P.C. Kit II Boss Hand Clap, Boss Perc, Synth, Yamaha MR10. Drumtracs, Drumulator, Korg DDM 110 and DDM220.**

YAMAHA NEW
The Yamaha Recording System £749

EFFECTS & MICS

Tokai
tread on one today

This superb new budget range of pedals is now in stock. Come and

BOSS
The **Boss** range of pedals is quite easily the fastest selling effects in the UK. We carry the complete range of Boss pedals and our prices are most competitive.

Always in stock is a superb range of quality microphones from the following companies, all at very good prices. **Shure, AKG, Audio Technica, Chaser, Beyer, etc.**

STOP PRESS
ARRIVING SOON!
"MAINFRAME" the ultimate support system for your keyboards and P.A. keyboards.

With all the components on the PCB, the next task is to wire the whole thing into the DDL circuit. Figures 1 and 3 show boxed labels that refer to the points on the DDL circuit at which wire links should be inserted and are quite explicit in their instructions, as the inclusion of IC pin numbers will tell you. You'll also see numbers in all the boxes except the Freeze one, and these correspond to the numbered positions in Figures 5 and 7 for easy cross-referencing.

Making connections to IC legs shouldn't pose any problem, as it's simply a case of taking each IC out of its socket, bending the appropriate legs out from the body, returning the chip to the socket and soldering each bent-out leg (which is no longer connected to the circuit) to its corresponding wire. Take care not to hold your soldering iron against any leg for too long, or you'll damage the IC. There are a few connections which aren't to IC legs, *viz* the link between point 1 and one end of R55; the wires for points 12 and 13, which are +5V and digital 0V connections respectively and should be soldered to the tracks on top of the PCB; the wire between point 14 and S8, which can be inserted through a board connection hole (see Figure 7) and soldered from above; and the Freeze connection, which should be made according to the instructions in Figure 8 – note that S3 and JK4 are wired according to this Figure, not as shown in the original Powertran circuit diagram. One final point is to ensure that IC legs 3, 4, 5 and 6 should be linked together as shown in Figure 7. Any 5V and 0V lines you might need can be picked up from some convenient point on the main PCB.

The last job is to mount the PCB and the two switches inside the DDL case. The thing to do is mount the PCB on its two jack sockets towards the rear of the case, above the power supply board. In fact, Figure 9 should give you all the PCB mounting details you'll need.

Before you set out, bear in mind you'll have to remove both front and back panels in order to drill holes in them, not only because it makes life a hell of a lot easier, but also to avoid leaving any metal chips inside the case – they could short out tracks on the PCB. I've indicated that the switches should go on the front panel (it seems the most logical place for them to be), but you are of course at liberty to mount them wherever you wish. One disadvantage of putting them on the front panel is that they'll need fairly lengthy connecting wires to link them to the PCB, and you'll probably have to twist these together for neatness' sake.

Using It

If you want to use your modified DDL in 'Emulator' mode, you need two things: an external signal with a frequency between 190Hz and 1.5kHz and, ideally, a trigger signal as well. Assuming you're using a synthesiser of some description, set it up with just the one oscillator on and producing a sine or triangle waveform. If you have to use another waveshape, filter it so that it contains little more than a fundamental frequency component. Filter sweep should be set to zero, as should any VCO frequency modulation, at least when you're actually in the process of sampling a sound.

If no trigger or gate out facility is available on your particular synth, you'll have to use the VCA to effectively gate the clock signal on and off by setting its envelope to an on-or-off configuration.

Figure 3. Circuit diagram of external oscillator section.

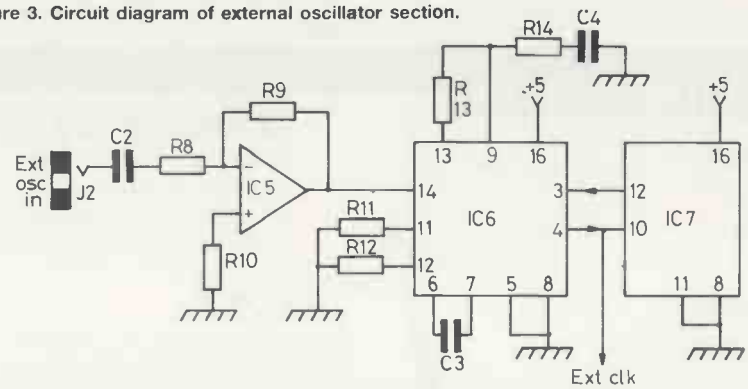


Figure 4. Operation of phase-locked loop as frequency multiplier.

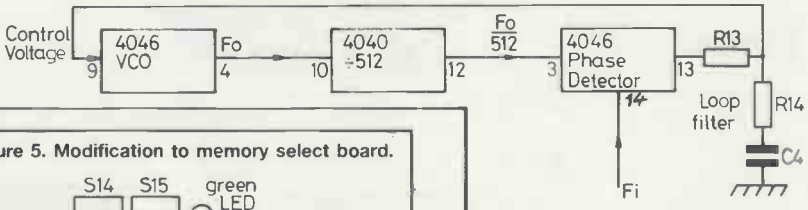
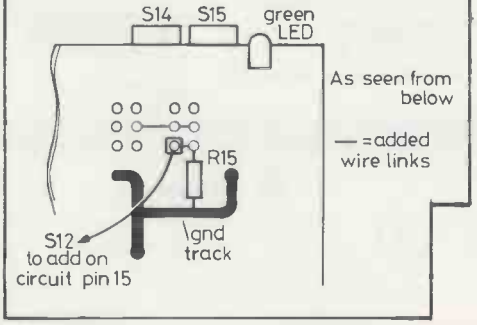


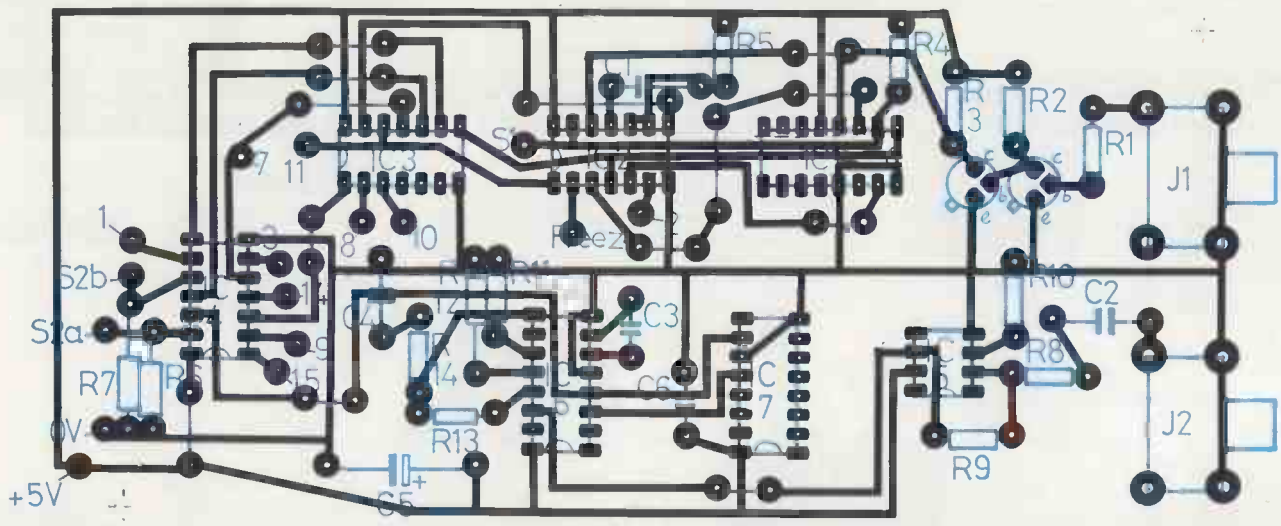
Figure 5. Modification to memory select board.



However, be warned that without any form of trigger signal, the DDL won't return to the start of a sample each time a new key is pressed. Thus a trigger really is a necessity, especially if you're going to be using samples with a decaying amplitude envelope, like percussion sounds, for instance.

If you do have a trigger at your

Figure 6. PCB component overlay



GiG SOUNDS

22 RUSHEY GREEN 01-690 8621
CATFORD, SE6 01-690 8622

86-88 MITCHAM LANE 01-769 6496
STREATHAM, SW16 01-769 5681

AMPLFICATION

TRACE ELLIOT

We would like to invite all bass players to see and try out the **TRACE ELLIOT** range of amplification. Bring your instrument in and put these 'state of the art' systems through their paces! And now we've got a new store ready to take your old rigs in part exchange so there's never been a better time to make the change up to **TRACE ELLIOT!**

PLUS The very best equipment from Peavey, Marshall, Carlsbro and Session. All in stock and ready for you to try.

PEAVEY

PA SYSTEMS . . . You can't afford to shop anywhere else whilst we can offer you a choice of the best! Martin, JBL, Bose, Tannoy, Kudos – systems designed to meet *your* needs.

MULTITRACK RECORDING

FOSTEX

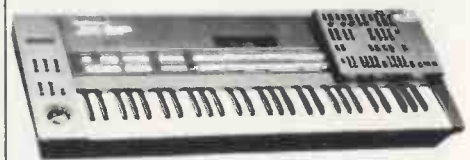
B16s NOW IN STOCK – also TASCAM 38+TASCAM 32 machines + the amazing Porta One, 244, 234, Fostex 250 + X15.
Superb package deals when pairing multi-track machines to desks. Choose from RAM, Seck, Studiomaster + Soundtracs.

X15 ... EX DEMO £245!!
BUT HURRY, WE'VE ONLY GOT A COUPLE!!

EVERYTHING YOU NEED For Multi-Track Recording.
Microphones – the best choice from Electrovoice, Sennheiser, Beyer, Shure + AKG.
Digital delay lines from Korg, Roland, Yamaha, Ibanez + Vesta Fire.
PLUS . . . many other sound processors, Ampex tape, Klotz cable, plugs, monitors. **We've got the lot!!**

SYNTHESIZERS

Roland



THE ROLAND JX8P . . . Possibly the most important product from Roland since the Jupiter 8! A wealth of sounds can be created and played with real musical expression using velocity sensitivity and after-touch techniques. WE CAN'T PRINT A PRICE . . . SO COME AND FIND OUT!!

NEW PRODUCTS!
Now in stock from Yamaha, the TX7 FM synth module, the QX7 sequencer + the incredible KX88 MIDI keyboard/controller. Also the Casio CZ101 multi timbral synth, the SCI multi track synth, and the Korg DW6000 polysynth at a new low price!!

AKAI

THE AKAI AX80 . . . New to the field of synthesis, Japanese giants Akai bring you the AX80. This synthesiser feels and sounds a lot more expensive that it actually is and its getting rave reviews right now . . . Come and see for yourselves!!

WE WANT YOUR PART EXCHANGES – WE WILL DO DEALS!!!

disposal, you can set the signal output from the synth to be permanently on, using an infinite sustain or hold facility if the synth permits. What makes this possible is the fact that the DDL stops as soon as it's been clocked to the end of its memory, which means that it'll automatically play the whole of the sample and then stop (rather than continuously looping as it would ordinarily do in Freeze mode), awaiting a trigger signal to tell it to start all over again.

As for sampling, there are a couple of possible approaches you can use depending on how many free hands you have, though in either case, you'll find a footswitch for the Freeze function is a real boon.

The first option is to set the trigger repeating regularly, using either a drum machine or a synthesiser's envelope repeat as the trigger source; the former's audibility makes it preferable. Don't set the trigger to occur too frequently, as this'll limit the amount of DDL memory you can use for the sample itself.

The sampling rate is set by the key you hold down on the synth. Try using a rate related to the keys in the second octave above Middle C (ie. 512-1024Hz), as this will keep aliasing down to a minimum. If you need a longer sampling time, you *can* use keys in a lower octave, but you'll have to switch the Powertran over to 4kHz bandwidth, again to minimise aliasing.

Make the sound you wish to sample just after the trigger beat occurs, hit the Freeze button, and your sample should then be held in memory awaiting playback...

The second option – the one that's dependent on your having a free hand – is to trigger the DDL manually by striking the appropriate synthesiser key just prior to making the sound to be sampled, and then hitting Freeze as before. You can of course sample sounds with the external oscillator switched out, something that would be particularly desirable if you only wanted percussive sounds triggered by a drum machine, say.

And the applications of the circuit aren't limited to sampling, either. For example, applying a drum machine to the external trigger input on its own can give you repeat echoes that are exactly in time with the beat – no more awkward fiddling with the Delay Time control! Come to think of it, varying the number of trigger pulses per measure as you go will give you effects changes (from long echoes to reverb, say) within the one pattern, without having to lay a finger on the DDL.

Alternatively, using the external oscillator on its own will free you from the single triangle wave option on the Powertran's own LFO. Is there no end to this? ■

Figure 7. Location of wiring points.

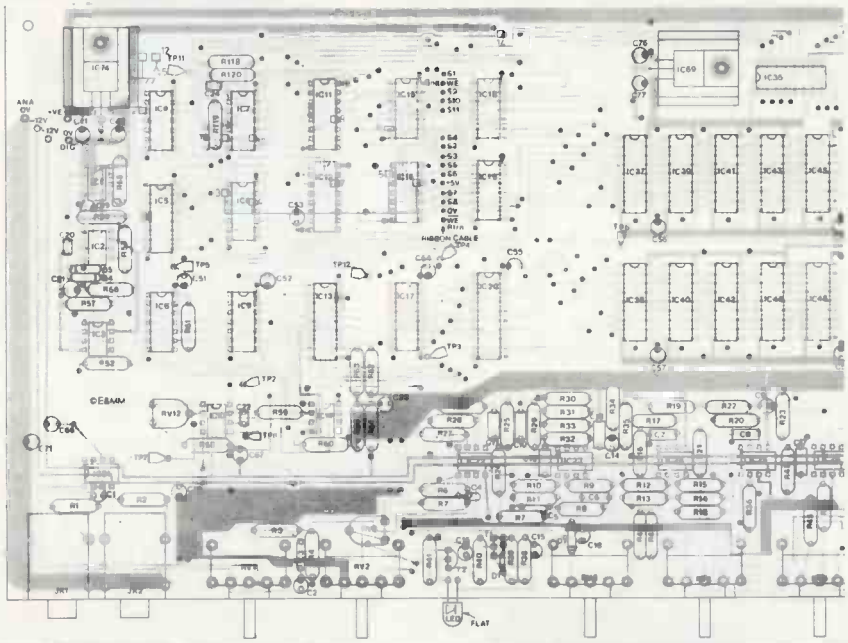


Figure 8. Location of Freeze connection.

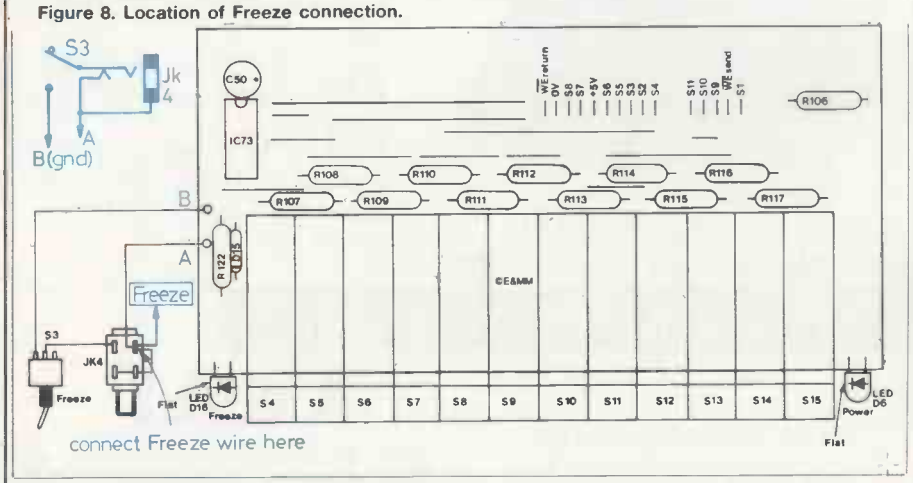
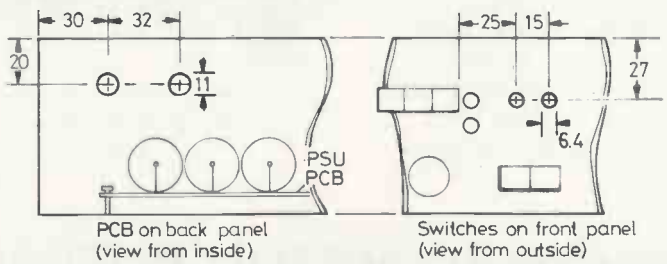


Figure 9. Mounting details (not to scale, dimensions in mm).



As mentioned above, a PCB for the above circuit complying to the layout illustrated is available direct from E&MM at £3.95 including VAT, postage and packing. Please make cheques/POs payable to Music Maker Publications, and allow 28 days for delivery.

Parts List

Resistors

R1	10K
R2, 3, 4, 6, 7, 15	1K2
R5	2K4
R8, 10	33K
R9, 12, 13	470K
R11	6K8
R14	43K

Capacitors

C1	270pF polystyrene
C2	220nF carbonate
C3	47pF polystyrene
C4, 6	100nF carbonate
C5	47µF 16V axial electrolytic

Semiconductors

TR1, 2	BC108
IC1	74LS76
IC2	74LS00
IC3	74LS32
IC4	74LS08
IC5	UA741
IC6	4046BE
IC7	4040BE

Miscellaneous

J1, 2	mono jack socket
S1, 2	sub-min toggle (single-pole, changeover)
Eight-pin DIL socket, 1 off	
14-pin DIL socket, 3 off	
16-pin DIL socket, 3 off	

FREEDMANS

- DRUMS - P.A. - TUMPETS - ACCORDIONS - MIC STANDS - GUITAR STRINGS - MIXERS - KARAOKE - SPEAKERS

MULTI TRACKERS - DIGITAL DELAYS - EFFECTORS - SEQUENCERS - SAMPLERS - LATIN PERCUSSION - VIOLINS - ELECTRONIC DRUMKITS - ACOUSTIC GUITARS - RHYTHM UNITS - BASS PEDALS - ELECTRONIC PIANOS - MUCH MUCH MORE

ORDERS OVER £100 CARRIAGE FREE

WE STOCK :- SHEET MUSIC - KEYBOARDS - STRINGS - MICS - CASES - CLARINETS - BANJOS - BASSES - ORGANS - CYMBALS - KAZOOS - MARACAS - SYNTHESIZERS

SYNTHESIZERS

ROLAND JX8P £1250
ROLAND JUNO 106 £*
ROLAND JUNO 6 £499
ROLAND MKB 1000 £*
ROLAND PLANET P £*
ROLAND PLANET S £*
ROLAND JX3P £699
YAMAHA DX 9 £799
YAMAHA DX 7 (DAMAGED) £1089
YAMAHA TX7 FM GENERATOR £699
YAMAHA TX 216 2x FM MODULES £1899
YAMAHA SK 20 £595 £345
CASIO CZ 101
CASIO CZ1000 £495 £999
AKAI 9X 80
SEQUENTIAL MAX £625
SEQUENTIAL 6 TRAK £599
KORG POLY SIX £625
ROLAND SH09 WITH GRIP £225
ROLAND SH1000 S/H £199
ROLAND RS 09 £275
SEQUENTIAL MULTITRAK £*

SEQUENCERS

YAMAHA QX7 £*
ROLAND MC202 £169
ROLAND MSQ100 £*
ROLAND MSQ700 £*
ROLAND MC4B + OPB + MTR 100 £499

COMPUTER + SOFTWARE

YAMAHA CX5M £469
YAMAHA YK01 £85
YAMAHA YK10 £165
ALL AVAILABLE SOFTWARE IN STOCK AT £36 EACH
EMR MIDI INTERFACE FOR BBC 'B' & SPECTRUM £150

RHYTHM UNITS

SEQUENTIAL DRUMTRAKS £799
ROLAND TR 909 £425
KORG DDM 110/220 £*
ROLAND TR 707/727 £*
KORG KPR 77 £199
ROLAND CR 5000 £255
ROLAND CR 8000 £355
BOSS 110 £119
TECHNICS DP50 £595
HAMMOND DPM 48 £499
DR BOHM DIGITAL £265
ROLAND TR 606 £189
ROLAND TR 303 £169
YAMAHA RX11/RX15 £*

MULTI-TRACK

FOSTEX X15 £299
YAMAHA MT44 + MM30 + PB30/20 £479
CLARION £499
CUTEC £399
YAMAHA MT44D + RM602 + RC35B £799
YAMAHA GQ 1031 G. EQUAL 3 BAND £199
YAMAHA Q2031 G. EQUAL 3 BAND x 2 £399
YAMAHA GC 2020 COMP/LIMIT STEREO £229

PIANOS

YAMAHA PF 10 DEMO MODEL £699
YAMAHA PF15 + FREE CASE £1049
RHODES 54 STAGE S/HAND £375
CLAVINET S/HAND £225
CLAVINET DUO S/HAND £325
ROLAND MP 20 £265
ROLAND PIANO + 450 £1350
ROLAND PIANO + 350 £1150
TECHNICS DIGITAL 10 £799

ELECTRONIC KEYBOARDS

TECHNICS SX 250 + FREE STAND/RAM/BOOK £469
TECHNICS SX 150 + " " " " £369
YAMAHA PS 6100 £949
YAMAHA PS 55 + FREE STAND/CASE/ADAPT £479
YAMAHA PS 35 + FREE CASE/ADAPTOR £379
YAMAHA PC 1000 + FREE STAND/CASE/ADPT £525
YAMAHA PS 300 £140
YAMAHA PC 100 + FREE ADAPTOR £175
JVC KB 600 £595
CASIO CT 6000 £649
MOST CASIO MODELS IN STOCK NOW!

ROLAND AMPS

CUBE 20 £125
CUBE 40 £165
CUBE 60 £190
CUBE 60B £210
CUBE 40C £175
CUBE 60C £205
SPIRIT 10A £*
SPIRIT 25A *
BN 60 *
BN 100 *
JC 50 *
JC 77 *
JC 120 *
JC 120H *
SUPER CUBES 40/60/100 *

P.A. BY KUDOS
COMBOS BY SESSION
COMPLETE RANGE OF MARSHALL IN STOCK
HIH AMPS & CABS IN STOCK NOW!
INCLUDING STUDIO SERIES COMBOS.
PRACTICE AMPS BY BADGER FROM £53
OHM AMPLIFICATION
NEW V-AMP COMBOS
MARSHALL SPECIALS
ONE ONLY MARSHALL 200W LEAD (SWITCHABLE HEAD £399

SCHOOLS
PLEASE NOTE - WE DESPATCH GOODS AGAINST RECEIPT OF AN OFFICIAL ORDER

£* BEST PRICES QUOTED TO PERSONAL SHOPPERS

EFFECTS !

BOSS BF2 FLANGER £71
BOSS CE2 CHORUS *
BOSS CE3 CHORUS STEREO *
BOSS CS2 COMPRESSOR *
BOSS DD2 DIGITAL DELAY £135
BOSS DF2 DIST/FEEDBACK (NEW) *
BOSS DM3 DELAY (NEW) £85
BOSS DS1 DISTORTION £47
BOSS GE7 GRAPHIC £67
BOSS HC2 HAND CLAPPER £51
BOSS HM2 HEAVY METAL *
BOSS OC2 OCTAVER *
BOSS OD1 OVERDRIVE £48 £44
BOSS PC2 PERCUSSION *
BOSS PH1R PHASER & RES £67
BOSS PH2 SUPER PHASER (NEW) *
BOSS SD1 SUPER OVERDRIVE £47 £55
BOSS TW1 TOUCH WAH
BOSS BX 400 MIXER £75
BOSS BX 600 MIXER *
BOSS BX 800 MIXER *
BOSS DE 200 DIGITAL DELAY (RACK) *
BOSS CE 300 CHORUS (RACK) (NEW) *
BOSS PLAYBUS + PHONES £135
BOSS TU12 TUNER *
BOSS TU12H TUNER *
BOSS KM 4 MIXER £41

AMDEK KITS

RMK 100 PROG RHYTHM £33
PDK 100 POWER DISTRIBUTER £16

EFFECTS BY :- WASHBURN PEARL, ARION, GUYATONE IN STOCK NOW!

SPECIAL
VOX COMPRESSORS £20

HH BARGAINS

1 ONLY BASS BABY HEAD £260 (150W)
1 ONLY BASS MACHINE HEAD £325 (250W)
1 ONLY POWER BABY LEAD COMBO £299 (150W)

PERSONAL HEADPHONE AMPS

NANYO PERSONAL STUDIO £95
ARION HOT WATT £89
JHS ROCK BOX £119
BOSS PLAYBUS INC PHONES £135

RACK EFFECTS

DIGITAL DELAYS BY :-
BOSS, IBANEZ, WASHBURN, YAMAHA
YAMAHA R1000 £495 (REVERB)
DELTALAB EFFECTION JUNIOR DELAY £219
STACK IN A RACK *
FRONTLINE X4 MULTI EFFECT *

PICKUPS

LARGE RANGE IN STOCK BY :-
DI MARZIO - SEYMOUR DUNCAN - EMG.

HOT LICKS INSTRUCTION TAPES (ALL POST FREE)

HOW TO PLAY GUITAR 1 TO 6
ROCK GUITAR 1 TO 6
LEAD GUITAR 1 TO 6
ADVANCED LEAD GUITAR 1 TO 6
BLUES GUITAR 1 TO 6
RHYTHM & BLUES GUITAR 1 TO 6
JAZZ ROCK FUSION GUITAR 1 TO 6
JAZZ GUITAR 1 TO 6
NASHVILLE GUITAR 1 TO 6
SYNTHESIZER WORKSHOP 1 TO 6
ROCK PIANO 1 TO 6
ACOUSTIC LEAD GUITAR 1 TO 6
HEAVY METAL GUITAR 1 ONLY
KEYBOARD CHOP BUILDER 1 ONLY
STEVE MORSE CLASSIC GUITAR 1 ONLY
HOT TRACKS 1 ONLY
ALL THE ABOVE £8-95 EACH
STEVE MORSE MASTER SERIES
2 TAPES + BOOK £18-90 COMPLETE
TAL FARLOW MASTER SERIES
2 TAPES + BOOK £18-90 COMPLETE

GUITARS

LARGE STOCK OF ELECTRICS, BASS, ACOUSTIC + CLASSIC GUITARS BY :-
YAMAHA, WESTONE, IBANEZ, WASHBURN, SQUIER, KAWAI, LOWDEN.
SQUIER STRATS '57 £221 '62 £229
SQUIER PRECISION '57 £211 '62 £220
SQUIER JAZZ '62 £221
SQUIER PAISLEY TELE RE-ISSUES £249
WASHBURN TOUR 24 BBR £310
WASHBURN WOODSTOCK ACTIVE £299
WASHBURN MONTEREY ACTIVE £399

DRUMS

UP ULTIMATE PERCUSSION ELECTRONIC KIT COMPLETE WITH 5 PADS & ELECTRONICS ONLY £499 (STANDS & PEDALS ALSO IN STOCK)
PREMIER ROYALE 5 DRUMKIT WITH STANDS & CYMBALS £450
TRAK POWER KIT £495 WITH CYMBALS & STANDS £695
TAMA SWINGSTAR KIT £469 WITH CYMBALS & STANDS
PEARL EXPORT DEEPFORCE 5 DRUMS + STANDS £445
MIRAGE 3 DRUM KIT WITH STANDS £195
LUDWIG BIGBEAT KIT WITH 24" BASS AS NEW £795
MANY MORE IN STOCK

MICS

BY SHURE, BEYER, SONY, AUDIO TECHNICA, FENDER
NEW SHURE PROLOGUE MICS :-
10 LO IMP £19 - 12 LO IMP £28 - 14 LO IMP £36
10 HI IMP £21 - SHURE 565D (UNIDYNE III)
COMPLETE WITH CABLE £69.

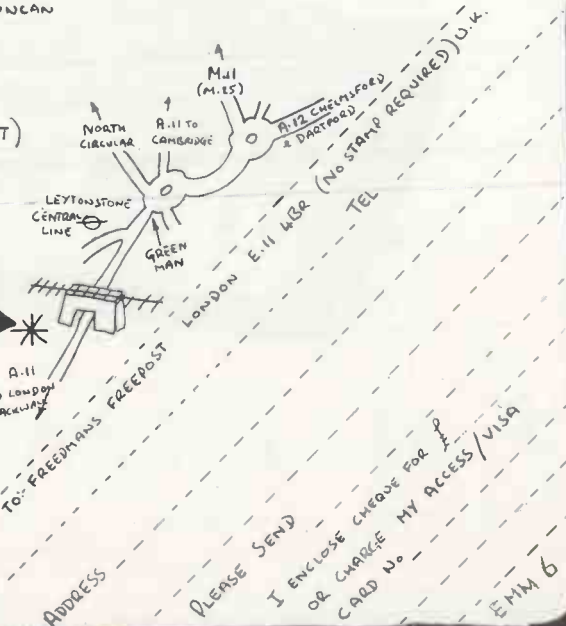
PRICES INCLUDE 15% VAT (OVERSEAS BUYERS EXEMPT)
FULL PARTS AND LABOUR GUARANTEE ON ALL ITEMS - P/X - H.P. 34.7% APR.

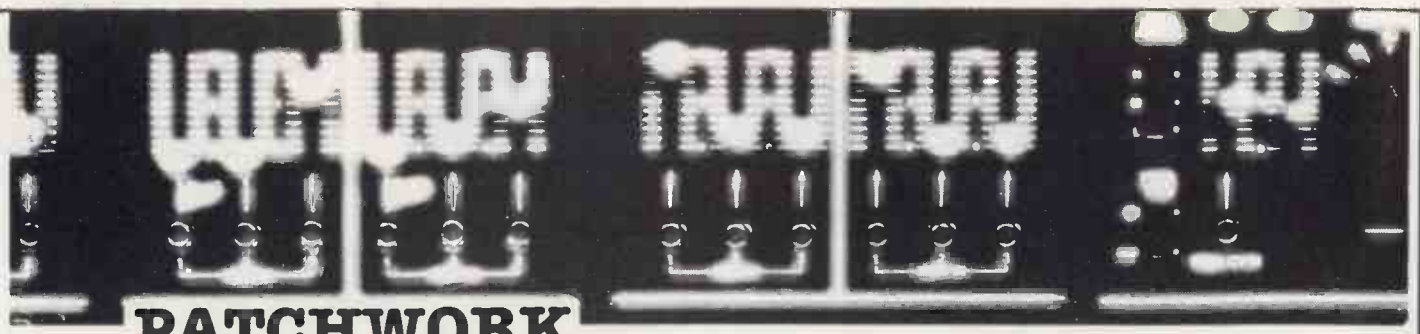
FREEDMANS

01-539 0288 (TWO LINES)

627-629-631 HIGH ROAD LEYTONSTONE
LONDON E.11 4PA ENGLAND

VISA ACCESS H.P. (CLOSED THURSDAYS)



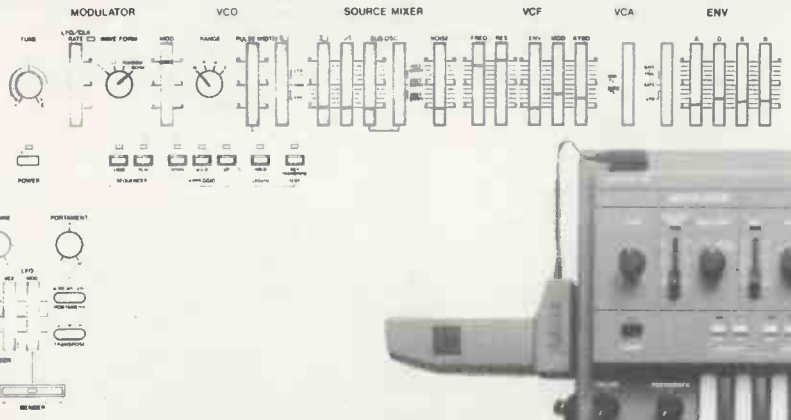


PATCHWORK

Readers send in details of their own synth patches and how they can be played...

OK, Spring is well and truly here, so it's time to remove the cobwebs around your equipment (as well as the ones in the grey matter area), and compile a few of your synth sounds for *Patchwork*... Send your offering on a copy of an owner's manual patch chart if possible (including a blank one for artwork purposes) to ***Patchwork*, E&MM, Alexander House, 1 Milton Road, Cambridge CB4 1UY.**

ROLAND SH101 — 'Rhythm Electronique' — A Mayor, Bedfordshire



It seems that the ever-versatile SH101 is never far from *Patchwork*'s door... The creator finds this sound is best employed to create backing rhythms and as the basis for a number of off-the-wall sound effects. Note that the patch can be used with any of the Envelope Mods (Gate+ Trig, Gate, or LFO).

KORG POLY 800 — 'Disco Duel' — Nigel Baker, South Africa

	DCO 1							MODE	DCO 2							NOISE	VCF							CHORUS	DEG 1				DEG 2				DEG 3				MG		MIDI		
	OCTAVE	WAVEFORM	16'	8'	4'	2'	LEVEL	DCO	OCTAVE	WAVEFORM	16'	8'	4'	2'	LEVEL	INTERVAL	DETUNE	LEVEL	CUTOFF	RESONANCE	KBD TRACK	POLARITY	EG INT	TRIGGER	ON/OFF	ATTACK	DECAY	BREAK P	SLOPE	SUSTAIN	RELEASE	ATTACK	DECAY	BREAK P	SLOPE	SUSTAIN	RELEASE	ATTACK	DECAY	BREAK P	SLOPE	SUSTAIN	RELEASE	FREQ	DELAY	DCO	VCF	RCV CH	PROG CHANGE	SEQ CLK
A	2	2	1	1	0	0	17	2	2	2	1	1	1	0	17	12	1	0	41	4	2	2	8	2	1	0	26	23	20	17	20	0	24	17	20	12	21	0	17	17	25	0	20	0	0	0	0	-	-	-
B	3	2	1	1	1	1	23	2	2	2	1	1	1	1	23	12	2	0	99	2	1	2	1	2	1	0	31	21	15	21	23	0	31	31	0	31	23	0	31	0	14	0	6	7	0	0	0	-	-	-

A couple of sounds to get yer teeth into... The Resonance control of the first, 'Disco Bass' (A) can be varied according to taste, though a setting of above 4 or 5 will likely cause too much of the depth to fall away. Another variation is to add a bit of vibrato by changing parameter 83 to a setting of 1.

The 'Fat Synth' (B) is useful for those big chord sounds, and the cutoff frequency can be lowered if a warmer, mellower sound is what you're after.

CASIO CZ101/CZ1000 — 'Shuttle Blast Off' — Brian Jones, Devon

Patchwork bids a warm welcome to Casio's baby, even if the Phase Distortion sound in question is a little unorthodox by our standards... Brian suggests holding down a major chord until the spacecraft enters hyperspace (patience is needed here), and then releasing the keys for re-entry and landing. Reverb and/or echo can be added for extra *Star Wars* realism. Anyway, full marks to Brian for designing his own patch chart – and shame on Casio for not supplying one with their owner's manual. Don't let that put *you* off submitting CZ patches...

Parameter	Data			
VIBRATO	WAVE = 4	DELAY = 99	RATE = 56	DEPTH = 55
OCTAVE	RANGE = -1			

	LINE ONE								LINE TWO							
DCO WAVE FORM	FIRST = 8				SECOND = 3				FIRST = 6				SECOND = 0			
DCO PITCH ENVELOPE	STEP	1	2	3	4	5	6	7	8	STEP	1	2	3	4	5	6	7	8
	RATE	13	44	87	50					RATE	66	65	50					
	LEVEL	76	41	99	00					LEVEL	00	00	00					
	ENV. POINT	-	SUS	-	END					ENV. POINT	-	-	END					
DCW KEY FOLLOW	RANGE =									RANGE =								
DCW WAVE ENVELOPE	STEP	1	2	3	4	5	6	7	8	STEP	1	2	3	4	5	6	7	8
	RATE	99	83	32	50					RATE	26	50	78	64	71	67	68	57
	LEVEL	92	84	00	00					LEVEL	99	99	70	53	58	36	29	00
	ENV. POINT	-	SUS	-	END					ENV. POINT	SUS	-	-	-	-	-	-	END
DCA KEY FOLLOW	RANGE = 2									RANGE = 2								
DCA AMP. ENVELOPE	STEP	1	2	3	4	5	6	7	8	STEP	1	2	3	4	5	6	7	8
	RATE	89	03	91	32	99	00	31	07	RATE	99	92	99	54	71	72	10	04
	LEVEL	99	99	02	99	01	99	99	00	LEVEL	99	99	99	74	52	40	89	00
	ENV. POINT	-	SUS	-	-	-	-	-	END	ENV. POINT	SUS	-	-	-	-	-	-	END

DETUNE (+)	OCTAVE = 3	NOTE = 11	FINE = 60
BEND RANGE	RANGE = 0		
PORTAMENTO	TIME = 0		
LINE SELECT	1+1		

YAMAHA DX7 — 'Brass-Solo' — Johan Axelsson, Sweden

Another regular visitor to *Patchwork*, the DX7 is seen here being manipulated to obtain a good brass sound for solo lines, and is best played with after-touch and a lot of 'wheeling' (Johan's word, not ours!) on the pitch-bender, which should be set to Range 2 for optimum results.

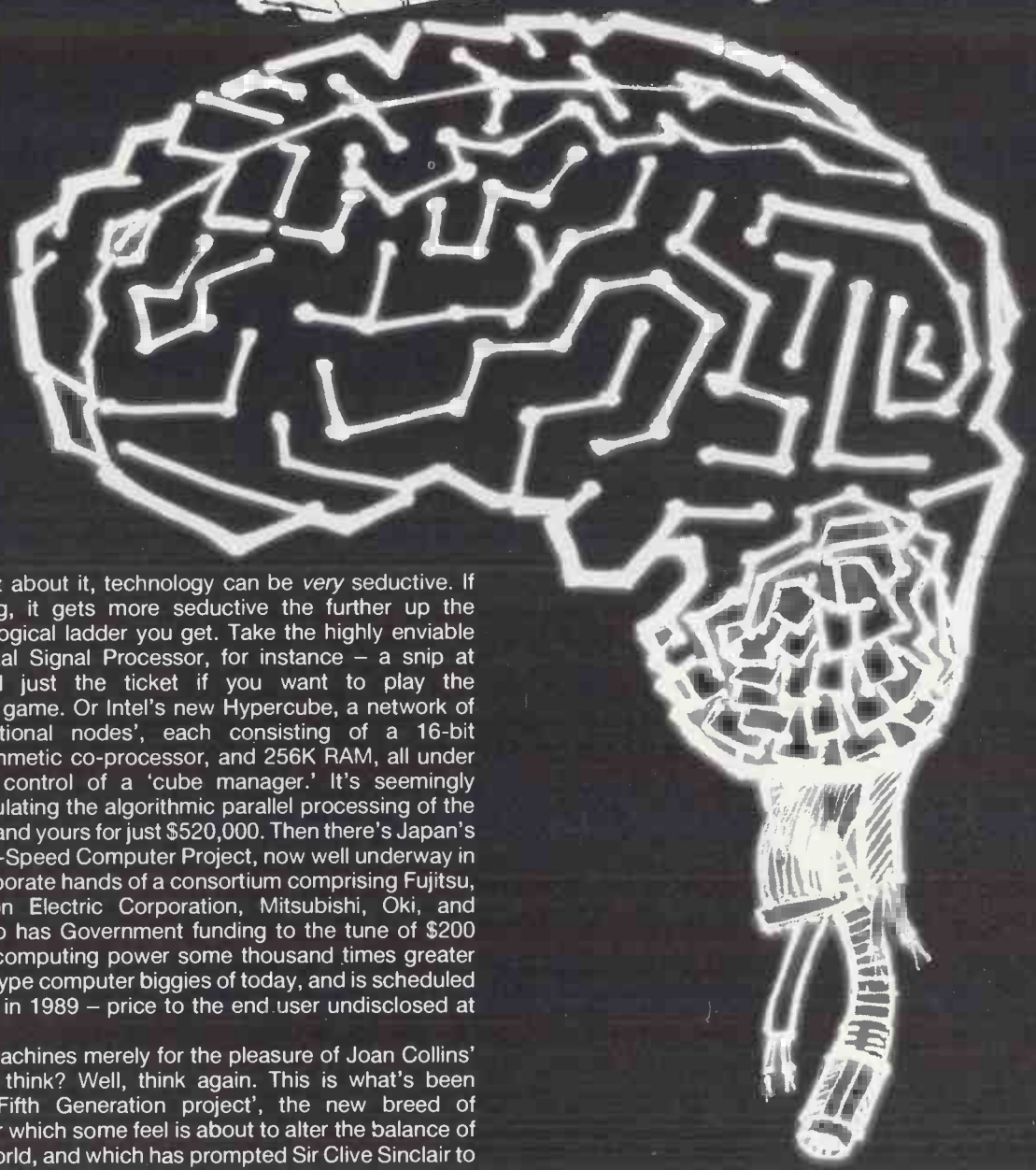
ALGO RITHM	FEED BACK	LFO WAVE	LFO SPEED	LFO DELAY	LFO PMD	LFO AMD	LFO SYNC	MOD. SENSITIVITY PITCH	MOD. SENSITIVITY AMPLITUDE
2	7	∿	37	63	14	0	OFF	3	0 0 0 0 0 0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	POLY/MONO	PITCH BEND RANGE	PITCH BEND STEP	PORTAMENTO MODE	PORTAMENTO GLISSANDO	PORTAMENTO TIME									

OP	MODE/SYNC	FREQ. COARSE	FREQ. FINE	DETUNE	EG RATE 1 2 3 4	EG LEVEL 1 2 3 4	BREAK POINT	L CURVE	R CURVE	L DEPTH	R DEPTH	KBOARD RATE SCALING	OUTPUT LEVEL	VELOCITY SENS.	PITCH EG RATE 1 2 3 4	PITCH EG LEVEL 1 2 3 4	KEY TRANSPOSE	VOICE NAME
6	R	2	00	0	72 76 10 65 99 86	0 0						0	82	0				
5	R	2	00	0	66 73 10 65 99 87	0 0						0	80	0				
4	R	2	00	0	67 74 10 65 98 87	36 0						0	72	0				
3	R	2	00	+6	65 15 10 65 99 87	0 0						0	96	0				
2	R	2	00	-6	64 68 32 65 99 90	90 0						0	84	2				
1	R	2	00	0	75 76 10 65 99 91	36 0						0	99	2				
	ON														84 99 99 99	50 50 50 99	C2	Brass-Solo

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
MODULATION WHEEL				FOOT CONTROL				BREATH CONTROL				AFTER TOUCH			
RANGE	PITCH	AMPLITUDE	EG BIAS	RANGE	PITCH	AMPLITUDE	EG BIAS	RANGE	PITCH	AMPLITUDE	EG BIAS	RANGE	PITCH	AMPLITUDE	EG BIAS

COMPUTER MUSICIAN



No doubt about it, technology can be *very* seductive. If anything, it gets more seductive the further up the technological ladder you get. Take the highly enviable Lucasfilm Digital Signal Processor, for instance – a snip at $200,000, and just the ticket if you want to play the megaproducer game. Or Intel's new Hypercube, a network of 128 'computational nodes', each consisting of a 16-bit processor, arithmetic co-processor, and 256K RAM, all under the executive control of a 'cube manager.' It's seemingly capable of emulating the algorithmic parallel processing of the human brain – and yours for just $520,000. Then there's Japan's National Super-Speed Computer Project, now well underway in the mighty corporate hands of a consortium comprising Fujitsu, Hitachi, Nippon Electric Corporation, Mitsubishi, Oki, and Toshiba. It also has Government funding to the tune of $200 million, a raw computing power some thousand times greater than the Cray-type computer biggies of today, and is scheduled for completion in 1989 – price to the end user undisclosed at present.

Expensive machines merely for the pleasure of Joan Collins' toy boys, you think? Well, think again. This is what's been dubbed the 'Fifth Generation project', the new breed of supercomputer which some feel is about to alter the balance of power in the world, and which has prompted Sir Clive Sinclair to say: 'The Fifth Generation is the greatest battle-ground of the century. If we lose, we are out of the game.' And he's not kidding.

Because what really counts here isn't *just* the technology, but who's doing what with it. These supercomputers will thrive on data. Knowledge, information, call it what you will – data is number one in the Fifth Generation rush to create the ultimate Expert System. Already, vast numbers of Japanese and American firms are queuing up to relieve the wise of their lifetime's accumulated expertise. And that's not just in the fields that obviously fall within the aegis of information technology. The Arts are getting involved as well. Just imagine, an expert system that'd enable any Tom, Dick, or Harry to synthesise and produce album quality music on their 1990s home micro with all the codified expertise and experience of George Martin, Trevor Horn, and Steve Levine rolled into one glorious Music Producer 'knowledge base', and available at all good newsagents for just 100 European money units.

Fanciful? Perhaps – but perfectly feasible if market forces allow it. And that begs the question as to whether the Japanese music and micro industry will get a look in at the delights of the Fifth Generation. Some critics predict that Japan is out to do for the sale of knowledge and information in the 1990s what the United Arab Emirates do for oil now. But for a country with such a forward-looking policy on the 'data as commodity' front, it does seem mightily curious that they've allowed such an ill-conceived export as the MSX range of micros to slip through.

Actually, unanswered and unanswerable questions abound when it comes to the immediate effect of the Fifth Generation technology on you or I. Remember that a change in the balance of power is on the cards – not just from the West to the Far East, but also from hardware and software to knowledge itself. To quote Sun Tzu, a general of the Chou dynasty, 'Knowledge is power and permits the wise sovereign and the benevolent general to attack without risk, conquer without bloodshed, and accomplish deeds surpassing all others.'

And you thought the DX7 was powerful... ■

David Ellis

Rumblings...

The computer music news page that tells you it first. As in recent months, this issue's roundup has a decidedly American flavour. *David Ellis*

News is coming in of a pretty sharp-sounding digital synthesis add-on for that doyen of the US computing biz, the IBM PC. The single-board box of tricks goes by the name of **Armonyx** and comes from a company of the same name in sunny California. Standard features include 92K onboard RAM, a 32kHz sample rate, 12-bit DAC output, 16-bit dynamic range, and a five-octave, velocity-sensing keyboard. Options available include either eight- or 16-note polyphony, a four-way split-keyboard mode, plus light pen or microphone input.

The whole shooting-match is efficiently menu-driven, and the 'starter system' includes a 32,000-note polyphonic sequencer, multi-instrument layering, a 'composer mode', harmonic entry using the aforesaid light pen, and 30 pre-constructed instruments. And then there's the next stage up, which adds the icing to the cake in the shape of sampling *via* the microphone or line input.

All of which sounds very interesting, or at least, it does to me. A cheque or money order for $3 will get you a demo tape for proof of the not inconsiderable pudding – the package itself will cost rather more. Anyway, all this and more info is available from *Armonyx Inc, PO Box 280, New Almaden, CA 95042, USA. ☎ (408) 268-9094.*

Polydrum

As **Polysoft** say, 'you can hear your drums. but can you see them?' I know that might sound silly, but it's a point worth making if you're a keyboard player who's not that accustomed to getting drum events oriented in time and space (like the author, for instance). And it's as an aid to these people that said company is now producing a package called Polydrum, which provides a Commodore 64-based composing tool for just about any MIDI drum machine on the market, be it E-mu, Korg, Linn, Oberheim, Roland, Sequential, or Yamaha.

What the $135 price buys you is an interface board, with MIDI Out, Clock In/Out, and metronome, plus a disk of software written by Richard Wolton, the guy behind the highly visual Musicalc software (see *Rumblings*, E&MM September 84).

The really good thing about Polydrum is that it gets all those problematic percussive events together courtesy of a Graphics Window Draw mode, which allows either joystick or QWERTY input of drum sounds, tracks, or accents. Other features include graphic faders for programming dynamics, punch-in/punch-out recording or erasing of single drum sounds, single tracks, or everything, all manner of auto-correction facilities (from whole notes to 32nd notes, with just about everything else in between), a display window which shows the drum score scrolling by in real time (or, as they put it, 'in past, present, and future' – HG Wells, eat your heart out...), and a 6000-note capacity to cap it all.

All good stuff, no doubt about it, but it seems monumentally thick to force people to buy yet another MIDI card for the Commodore 64, when it's an odds-on favourite that musicians using that micro for non-Mickey Mouse musical activities will already have a MIDI card of some description readily to hand. Still, if you're not deterred by this unfortunate lack of foresight, and are interested in seeing how the manual shapes up, this is available separately for $15 (credited if you subsequently purchase the whole package). Note that prospective purchasers outside North America are requested to add a hefty 20% for 'shipping'! Anyway, Polysoft Unlimited may be found at *52 Longfellow Road, Mill Valley, CA 94941, USA. ☎ (415) 388-6666.*

MIDI Madness

Although the **Decillionix DX1** sound-sampling card for the Apple II has been more than a little over-shadowed by its cheaper and polyphonic brother, the Greengate DS3, designer Dan Retzinger is still beavering away at new software to enhance its features.

One of the latest releases is the bizarrely-named MIDI Madness, a $99 program that allows any MIDI keyboard to control the DX1, implementing voice-assigning, keyboard splits, and velocity-sensing. You'll also need an Apple II MIDI card, but Decillionix have one of those on offer as well. In fact, the $99 they're charging for this is good value considering the vastly inflated price ($195) Passport want for theirs. What's more, Decillionix's MIDI card is compatible with those made by Yamaha, Korg, and Passport themselves.

And so to another software product just out from the same source, namely The Interpolator (also $99). This allows you to analyse, display, or print out samples captured with the DX1, both for the sake of visual delectation (especially in the Chart Recorder mode of printing-out), and to transfer 256-byte wavetables over to a long-in-the-tooth Soundchaser or Syntauri system that's screaming for a little more Tender Loving Care. For more info, contact Dan Retzinger at *Decillionix, PO Box 70985, Sunnyvale, CA 94086, USA. ☎ (408) 732-7758.*

More from Mimetics

Finally, a quick word for **Mimetics Corporation**, who've sent us a flyer on the latest goodies to take their Syntauri legacy into something like the 21st Century. First, there's Metatrak 5.0, a $129 update of Syntauri's original software of that name. Nowadays, it also offers drum machine sync that actually stays in sync(!), a rather more musical vibrato (hard to be less, I'd have thought), and most important of all, a MIDI Out facility. The latter lets you assign each playback track to a separate MIDI channel, and also to use the Syntauri keyboard as a master controller – though I have to say that's the last thing I'd use it for. Like Decillionix, Mimetics have also got into the Apple MIDI card game, and their 'Proxima MetaMIDI' (talk about going OTT with titles) costs $95. It too is compatible with that from Yamaha, Korg (yawn), Passport, and... (correspondent dozes off).

Other software snippets of passing interest include the 'Meta Bag o' Tricks' package ($35), which aims (wishfully?) to give true velocity-sensing to the system, amongst others things. Then there's 'The Splicer' ($40) for rapid rearrangement of segments within a Metatrak piece, and last but not least, 'The LehrWare Sounds Library' ($75), a set of 100 'favorite sounds' for the alphaSyntauri, as compiled by *Studio Sound* contributor Paul D Lehrman.

It really is good to see Mimetics pulling the old digit out as far as Syntauri are concerned. After all, there was a time when the whole Syntauri thing looked as if it was doomed to vanish down an almighty great plughole, which didn't bode too well for the few thousand or so owners who'd invested their hard-earned cash in the system (that includes a fair number in the UK, incidentally). Mind you, I'm waiting to see whether the company's new and rather more upmarket 'Genesys 1' digital hardware for the Apple II really is as good as some are claiming. For more details, contact *Joy Weigel, Mimetics Corporation, PO Box 60238, Sta. A, Palo Alto, CA 94306, USA. ☎ (408) 741-0117.* ■

call in for your free APRS ticket

The case for the Fostex Tracker while stocks last, it's almost FREE

Remote control as shown is not included in this special offer.

Without doubt, the Tracker is the best value in four track.

Those very clever Fostex people have recognised songwriter's needs and have produced a whole range of accessories to compliment their palm sized studio.

Firstly, the battery pack and carrying strap come free with your purchase.

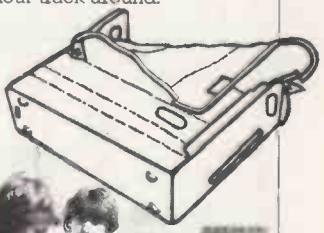
The 'Orange', seen in the photo, is a remote control that lets you punch in to record remotely. 'Juice' is their name for the mains adaptor to save on the cost of batteries.

Quite recently, the 'Squash' was introduced. This four channel mixer with a built in compressor lets you bounce down or mix in extra inputs or a mike - while at the same time tightening the sound, adding commercial punch to your recordings.

The Tracker studio system offers you the chance to make professional sounding demos, anywhere the music is.

Which brings us to the offer. Because while stocks last, we're offering the custom carrying case FREE of charge with any X15 purchase.

Call in to the Turnkey Shop, watch the X15 video, hands-on demo for yourself, and walk off with the best deal in four track around.



We are known to sell the odd mike.

If you've seen our green catalogue, then you'll be aware of the very wide range of mikes that we carry in stock.

Now, you can buy these direct from the Turnkey Shop.

As well as best prices on AKG, Shure, Sennheiser and Beyer, we feature several odd shaped, great sounding types.

For example, the budget priced PZM shown above is a consistent favourite. We also stock the C-Ducer range, plus tiny lavalier electrets that work well for close acoustic work. Call in for a demo.

A full range of stands, clips and accessories is available.

The best four track you can buy

This is a one off offer, intended only for an absolute perfectionist.

We have one only OTARI Series 5050 half inch four track recorder. Specifications are beyond impeccable. You need no noise reduction to achieve superb recordings.

XLR's, accurate metering, full alignment access, in fact every feature you would expect on professional recorders.

This is a unique oppprtunity for a very special customer, at an unrepeatable price.

Mixers. Do you have any choice?

While there are just one or two multitracks within reach, it can seem like hundreds of mixers to choose from.

We've got more than our fair share on show and on demo at the Turnkey Shop. The pick of the Soundcraft, SECK, RAM, Fostex, RSD, Soundtracs and Tascam ranges. Chosen and priced to represent the best value in multitrack.

Check out the widest range in eight and sixteen track at the Turnkey Shop at no obligation.

You are welcome to visit the Turnkey Shop any weekday, from 9:30 till 5:30, till 4:30 Saturdays.

Our expert sales staff are musicians too, and will be pleased to advise you on the creative as well as technical aspects of recording.

You will discover the widest range of the latest in recording products, and all the help and friendly advice you need.

Visit Britain's foremost showcase of Pro-Audio soon!

In the Post

You can buy the products featured on this page directly by mail. Phone or send your order with Visa or Access number, or ask for a *free copy* of our 72 page catalogue. It's an invaluable guide to products and techniques.

Delivery charges apply as follows; orders up to £9 then £1, up to £40 then £2, from £40 to £300 then £3. Larger orders, please call for price quote.

Write to;
Turnkey by Mail
Brent View Road
London NW9 7EL
Telephone; 01-202 4366
Telex; 25769 A/B TKBAN

Downtown Soundcraft

As Soundcraft's main dealer, supply and installation of their products is a major part of our business. Major consoles are to order only, but the compact range is on demo display at the Turnkey Shop.

From 4 to 24 track, call in for information or specs. Nobody knows Soundcraft better.

Instant Acoustics now on sale

Illsonics sculptured foam panels can offer remarkable sound control. They absorb troublesome reflections as well as an open window. Just a few, placed carefully by trial and error, can correct the acoustics of recording room.

Ask for a copy of the Acoustics Cookbook, and discover how easily you can correct acoustics. Now on sale at The Turnkey Shop.

the turnkey shop

The Turnkey Shop, 14 Percy Street, LONDON W1P 9FD. Nearest Underground station, Tottenham Court Road.
Instant Finance of up to £1000 is available to personal callers who hold a valid Major Credit Card.

Microsound Digital Music System

MIDI Sampling Hardware and Software for Commodore 64

Yet more British innovation, this time in the form of a MIDI-equipped sampling system for the world's most popular home micro. It's remarkable value for money. *Simon Trask*

If you're a reasonably long-standing E&MM reader, you'll probably remember a review of the Microsound CBM64 keyboard and sequencing software appearing in the July '84 issue. A postscript to that review drew attention to the fact that a sound-sampling add-on had been fully developed. Well, that unit – complete with software – *did* put in an appearance towards the end of last year, but it has since been completely upgraded (it's now MIDI compatible and offers a longer sample time, among other things) and given a stylish casing.

And it's this new improved version, now being marketed under the rather grand title of Digital Music System and scheduled for general release in June, that's the subject of this review.

Overview

The Digital Music System (henceforth referred to as DMS, you'll be glad to know) is a monophonic sampling system with a maximum 33kHz sample rate. Minimum sample time is one second, with the sample and all user-defined variables being held in 40K of the Commodore 64's memory. Looping of samples is one of the facilities supported, with the system's editing facilities being capable of eliminating just about any inherent glitches you might come across. And once it's been edited to your satisfaction, your sample is playable from Microsound's own music keyboard, any MIDI keyboard, or the 64's QWERTY keyboard – a handy range of controlling options.

The sampling unit itself is a slimline 9" x 5" cream and black affair that connects to the Commodore *via* the cartridge port, and requires either PP3 or PP6 batteries or a 9V DC power supply in order to function. Included in the unit are a programmable 24dB anti-aliasing lowpass filter to reduce distortion (and with cutoff variable between 4kHz and 15kHz), and pre/de-emphasis circuits to reduce quantisation noise. All very sensible so far.

The unit's front panel houses a quarter-inch jack socket for mic/line input and rotary knobs for adjusting input and output levels, the latter also functioning as an on/off switch. The back panel contains a jack output, 9V DC input, and MIDI In and Out sockets (standard-issue five-pin DINs), as well as sprouting the ribbon cable connector to the 64.

> 'The sampler's response time is good enough to handle the fastest runs on both MIDI and Microsound keyboards.'

And at the other end of the ribbon cable we find...an Issue One DMS Interface card, which in turn slots into the 64's cartridge port. The card on the review model was left bare to the world, a state of affairs that I hope will be rectified on the production models.

SamplingTime

Depending on which keyboard option you decide to go for, one of three control programs has to be loaded, a process that's clearly detailed in the user manual. Complete loading of the control program (whichever one you opt for) takes place in three stages, with an overall loading time of under a minute – refreshingly brief, that.

With the loading complete, the program's main menu confronts you with five options: Sample, Control Functions, Play, Edit, and Disk Options. Being a fairly logical sort of bloke, I started with the first of these.

Now, one of the biggest headaches of trying to get a decent sound sample is deciding precisely *when* to begin recording. As a rule, there are simply too many parameters to consider in too short a space of time for the human brain to cope. However, Microsound have given their Sample page two controls aimed at easing just this problem. First, there's a trigger delay facility that allows you to set a countdown of up to 255(!) seconds, then, once your countdown has reached zero, the trigger level parameter comes into the picture. What this means is that the sampling process isn't activated until the input signal reaches a predetermined level, this being implemented on a scale of 0-127.

As for the sample rate itself, this may be set at anything from 4-33kHz, giving a maximum bandwidth of 16.5kHz – certainly a reasonable figure. Anti-aliasing filter amount is selectable on a scale of 0-255, which is all very well, but what a shame you can't select the cutoff frequency itself. As things stand, selecting a suitable filter amount is a decidedly hit-and-miss affair, and you'll never derive the full benefits obtained from knowing what's *really* going on.

Anyway, once the above parameters have been set, you're given the opportunity to set a suitable master input level against your chosen trigger level, with a fluctuating 'bar graph' giving appropriate visual feedback on the monitor screen.

This done, the countdown begins onscreen, and assuming you've selected a non-zero trigger level, the system pauses at zero until a suitable signal is registered, at which point the screen goes blank to indicate that sampling is taking place.

All very straightforward. One small gripe, though. There's no Escape option provided, so if you select the Sample page by mistake, it's bye-bye to any sample already in memory.

Sample Editing

Recording a sample is only part of the story, however. The DMS offers a number of editing options based around a time-domain waveform display of the sample, and a flexible pointer system that allows sections of the ▷

digimemory

DIGITAL EPROM-PLAYER FOR ALL TYPES OF EPROMS

CHIPS/Eproms 2732/2764/27128/27256
pitch control (1 octave UP – 1 octave DOWN) 12kHz–42kHz
manual play knob
external trigger input
full dynamic (touch sensitivity) range 40dB
output 10K ohm (line level)+10dB maximum
external power supply 18:18 min/24:24 max+250mA/–25mA

the winner

MICROPROCESSOR CONTROLLED DIGITAL SOUND SAMPLER

A microprocessor-controlled digital sound sampler, Eprom programmer, Eprom blower, Eprom copier, MIDI and computer serial in-output.

FEATURES INCLUDE:

Dynamic control, pitch control 1 octave UP/1 octave DOWN; Eprom programmer works from RAM to ROM and/or ROM to RAM; Epromblower enables to load each Eprom as selected; Eprom copier enables to make a copy of each Eprom; MIDI-interface enables connection directly to each keyboard with MIDI/in; computer in/output enables connection with each home and/or personal computer; special effects – with a very high quality standard – are: digital delay, echo and reverb; triggering by means of keyboard, triggermike, triggerpulse as well as external as internal.

ted

DISTRIBUTED FROM: CAPELLE MUSIC
333 LONDON ROAD, HADLEIGH, ESSEX.
TEL: 0702-559 383

AVAILABLE FROM ALL LEADING RETAIL SHOPS

YAMAHA SPECIAL OFFERS!
PF10 DIGITAL PIANO..JUST £545
KX5 REMOTE MIDI KEYBOARD
..NOW FOR AN AMAZING £199
R1000 DIGITAL REVERB..£399

JONES & CROSSLAND

GASP!!

ROLAND..ROLAND 85
If They Make It...Then We Stock It!
JP8P Available from stock..NOW!
MKB 1000 Mother Keyboard...
..and ALL Modules!
Super 'Gaspo' Deals currently on JX3P..Only while stocks last...!

JUNE'S CRACKIN' DEALS!

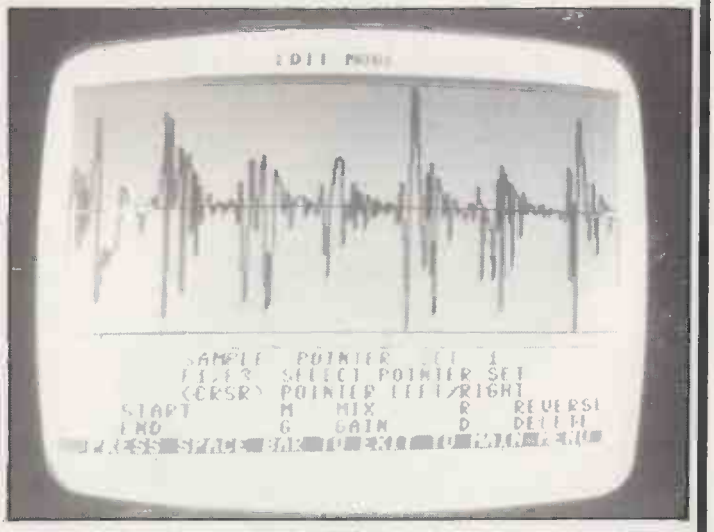
Stars & Stripes Amps at Rising Sun Prices!

YAMAHA HI-TECH
COME INSIDE & SEE ALL THESE SYSTEMS SET UP & RUNNING!
TX816 8 DX7's in a 19" Rack
TX7 Midi Expander (Must be heard)
TX216 Smaller Brother to the TX816
QX1 8 Track Digital Sequencer...
...1 Megabyte of Storage!!!
QX7 2 Track Digital Sequencer
DX5..Big Bro' to the classic DX7!
CX5M Computer & All Peripherals set up in our Computer Room...
Come in 'an hear 'em Today!...
.or Call up Ketch for details!
JUNE'S AMPLE BARGAINS!

STUDIO SALES
New BOSS Micro Rack Series
ROLAND SRV2000 Stereo Digital Reverb...
All ROLAND DDL's in stock
DYNACORD DRP 16
JBL?..We stock the lot at unbeatable prices!!
VESTA..FIRE..TASCAM..
ACCESIT..YAMAHA..
AHB..AMPEX..BEYER..
SENNHEISER..RAM..
DYNAMIX..AKG..GE
Phone Russel for a great deal!

DRUM SALES
Electronic Drums by:
SIMMONS..TAMA..
DYNACORD & UP
Drum Machines:
New ROLAND TR727
BOSS DR110..KORG
TR606 from £120!
YAMAHA RX11 & 15
Cymbals from
ZILDJIAN & PAISTE
Acoustic Drums from:
PEARL..TAMA..YAMAHA
& PREMIER..

COME & GET AN EYEFULL
At 4-8 Smallbrook Queensway Birmingham B5 4EN
OR PHONE: *021-643 4655/7*



waveform to be manipulated quickly and easily. Not quite yer actual Fairlight, you understand, but useful nonetheless.

The Edit page uses a hires/text split screen to display the sampled waveform, together with information on the various editing options available. The waveform takes between five and ten seconds to draw on the screen, depending on its complexity. What's particularly neat is the way Microsound have limited the display to a single screen (*and* kept to a workable resolution), which means you can view the waveform in one go without having to worry about scrolling screens and the like.

The basis of the DMS' editing system is the pointer set. There are two of these, each of which can be used to define any area of the sample storage memory. They have a dual function in that they also define an area to be sampled into – a clever bit of design that increases the power of the system (though inevitably at the expense of sampling resolution) by enabling several different samples to be resident in memory at once.

The two pointer sets are selected by pressing f1 or f3 on the Commodore's QWERTY. A crosshair is moved along the horizontal axis of the display by using the cursor keys, and start and finish points are selected by pressing 'S' or 'F'.

Currently-assigned start and finish points are indicated by further crosshairs, but although these are colour-coded for clarity's sake, this actually reduces visibility if you don't have the requisite colour TV or monitor, which is a bit silly.

The pointer sets are themselves part of the edit process, but once you've defined a particular area of memory/segment of waveform, there are four editing options that enable you to do ghastly things to your lovely sample (or vice versa, as the case may be). These are Mix, Gain, Reverse and Delete.

The pointer sets can of course be redefined at any time without there being any effect on the actual contents of memory. Mix, Gain and Delete, on the other hand, have an irreversible effect on the selected area of the sample, though Reverse is potentially non-destructive by virtue of the fact that anything reversed twice reverts to its original form. Or at least, that's what I *think* James Burke was saying the other night.

Space considerations prevent me from going into detail on the editing facilities, but in common with so much of the Microsound system, they're well considered and easy to use. The Gain option simply increases the amplitude of the portion of sample determined by the position of the pointer sets; Mix merges two such determinable segments together and places the result in the second of the areas; and Delete simply removes the delineated segment of sample and automatically closes the gap it occupied previously. The pointer set system, incidentally, succeeds in being both enormously flexible and splendidly successful at the same time.

Performance Stance

So, you've now got the sampled sound of your dreams locked safely away in the Commodore 64's memory. All you need now is some means of unleashing it onto the unsuspecting musical world. And as I've already hinted, Microsound have covered just about every eventuality in this department. If you don't own a MIDI keyboard and don't wish to incur the inevitable expense, you can opt for Microsound's own four-octave keyboard, which connects to the 64's two joystick ports and will set you back a modest £149. It's a perfectly usable keyboard, if a bit on the spongey side.

As an even cheaper alternative, you can 'play' the 64's QWERTY keyboard over four octaves (one octave plus switchable transposition). It's not ideal, but it's nice to know the option is there if you can only afford the sampler unit and software for the time being.

As for MIDI implementation, this covers basic note on/off reception, but importantly, the receive/transmit channels can be set to any one of the standard MIDI 16. This worked perfectly with a Casio CZ5000, and raised all sorts of sonic possibilities in the process. Only hiccup was that pitch became unpredictable when the keyboard was played outside of the Microsound's four-octave range – the CZ5000 has a five-octave span. My fault for trying to be too clever, probably.

On a brighter note, and of far greater significance, is the fact that the sampler's response time is good enough to handle even the fastest of runs on both MIDI and Microsound keyboards.

And so to the Control Functions page. This controls various performance features, most notable of which is a split-keyboard facility that splits the four-octave keyboard in half and places Pointer Set 1 on the left and Pointer Set 2 on the right. Don't get too excited – the sampler is still monophonic. But the facility does enable two sounds to be placed on the keyboard at the same time, which can't be bad, and it works equally well with either MIDI or Microsound keyboards.

But there's no point being able to do all this if you've got no means of storing your endeavours for posterity. As I've said, the sample and all user-defined variables are stored in 40K of the CBM64's memory, and this 40K can be saved to disk for later (though probably not 'instant') recall. Option 5 on the main menu controls loading and saving of samples, as well as cataloguing your sample disk from within the program, and the deletion of samples. You should find it possible to cram a maximum of four samples onto a single floppy, which is a lot better than some systems manage.

Conclusions

Any sound-sampling system ultimately stands or falls on the quality of its sampling, no matter how many additional facilities it offers. Happily, the Microsound DMS performs very well in this respect – and not just at its maximum sample rate, either.

The system succeeds in acting as an introduction to sampling, but more than that, it's good enough for use in semi-professional studio environment – so long as you're not bothered by the time it takes to save and load samples to and from disk.

And there's plenty new cooking in the Microsound kitchen, like an EPROM containing the complete DMS software for instant access on power-up, and a plug-in RAM card holding about five samples for instant access and switching. That should help quicken things up a bit.

Moving back to the present, the DMS control software is generally well conceived and easy to use, and provides enough in the way of editing and control facilities to provide a flexible system that's really *musical* in its range of application. The accompanying manual is clear and concise, too – no excessive verbiage to wade through here.

The time taken to add MIDI has been time well spent, and its inclusion opens up the possibility of the sampler being incorporated into a MIDI sequencer-based setup, something lack of time prevented me from doing during the review period, alas.

Asked whether or not I'd buy a DMS if I had the money, my initial reaction was an uncertain one. Then I tried to think of possible competition, and realised there wasn't very much. If you've already got a Commodore 64 and disk drive, you'll regret not taking the DMS for a test.

Even in these Mirage-infested times, the Microsound stands out as being a winner. ■

The DMS carries an RRP of £249, while the CBM64 music keyboard is a further £149, both including VAT. Further details from: Microsound Ltd, Orchard Dene, Lower Assendon, Henley-on-Thames, Oxon RG9 6AG. ☎ (0491) 575469.

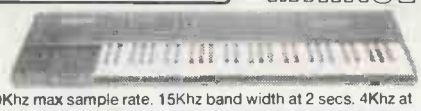
Soho SOUNDHOUSE

18a Soho Square,
London W1V 5FB,
Tel: 01-434 1365

VISA AMERICAN EXPRESS

SOHO SYNTH HOUSE

ensoniq MIRAGE



30Khz max sample rate. 15Khz band width at 2 secs. 4Khz at 8 secs. 5 octave, velocity sensitive, 16 point adjustable sound parameters. Onboard MIDI sequencer. User sampling. Built in micro floppy.

IN STOCK NOW £1695
SEND FOR FREE DEMO TAPE

SEQUENTIAL CIRCUITS INC

MULTITRACK SYNTH	£POA
TOM DIGITAL DRUMS	£POA
PROPHET V MIDI	£POA
SIXTRAK	£595
DRUMTRAX	£POA
VOICE CHIPS FOR DRUMTRAX	£POA
COM 64 SEQUENCER 64 REAL TIME SOFTWARE	£95

MATTEL ELECTRONICS

synsonics drums

AS ADVERTISED ON T.V.

● Bass, snare, 2 toms, Cymbal and HH ● Use sticks or hands ● Drum pads are touch sensitive ● Tom Tom 1 can be tuned over a 5 octave range ● 3 separate 16 beat memories allow storage of patterns. Each memory may be layered indefinately with patterns ● Accent button ● Roll button comes with leads to plug directly into your Hi-Fi/guitar amp.

Rec Retail Price £99.95
UNREPEATABLE OFFER
WHILE STOCKS LAST
FULLY GUARANTEED

£59 inc p&p

KORG KEY CENTRE

DW6000. DDM110 SUPER DRUMS
DDM220 SUPER PERCUSSION. POLY 800
POLY 61 MIDI. EX 800 EXPANDER
RK 100 REMOTE
ALL IN STOCK

Roland

COMPLETE RANGE IN STOCK

TR707 Digital Drums	JX8P Touch Sens. Synth
MXQ 100 Sequencer	Juno 106 Synth
MSQ 700 Sequencer	JX3P Synth
Mother Keyboard	TR909 Rhythm
Rack Modules	SDE 3/100 Delays
GT 700 Guitar Synth	MPU Peripherals

and much more including all accessories, pedals, cases etc. Low prices for callers.

Bond

THESE REVOLUTIONARY GUITARS ARE **IN STOCK** AT LAST.

PHANTOM. CHROME HARDWARE INC. CASE...£525

YAMAHA

HIGH TECH DEALER
CX5 MSX system, TX7+Expander, QX7 Sequencer, 816 FM modules, QX1, KX88 Mother keyboard, DX5, DX7, R1000, RX15, D1500, RX11, PF10, PE15 pianos.

IN STOCK NOW
PRICE ON APPLICATION

BOSS

BF2 Flanger	£69
PH1R Phaser	£68
HM2 Heavey Metal	£46
CE2 Chorus	£68
CE3 Stereo Chorus	£75
DS1 Distortion	£48
SD1 Super Overdrive	£41
GE7 Graphic	£68
DD2 Digital Delay	£148
DM3 Delay	£87
NF1 Noise Gate	£41
CS2 Comp/Sustain	£58
OC2 Octaver	£49
PC2 Percussion	£47
HC2 Hand clapper	£47
DF2 Distleed backer	£75
TU12 Tuner	£38
DR110 dr rythm	£109
PSM-5 power supply	£57
HA5 playbus and rh11m mic phones	£128

ALL INCLUDE P&P

SALE SALE SALE SAL

Fender EL Rio elec Acoustic	£215
Fender yale combo	£199
Fender studio lead combo 50W	£237
Fender stage lead combo 100W	£268
Fender montreux combo 100W	£332
Fender showman combo 200W	£440
Squier Bullet strat w. trem	£129
Squier humbucker w. coil tap	£111
Squier 57 precision bass	£185
Squier 62 precision bass	£189
Squier 62 jazz bass	£189
Roland cube 40 chorus	£135
Roland SDE 3000 dig delay	£525
Roland TR 909 rythm	£349
Simmons SDS 8 kit	£660
Simmons SDS 7 kit	£1850
Yamaha R1000 reverb	£398
SH101/MC202 Expander	£109

SECONDHAND ITEMS

Fender twin reverbs	£250
Fender strats from	£250
Gibson SG's from	£325
Gibson melody maker 57	£280
HH VS musician	£95
Sessionette 112	£189

CASIO

NEW
CZ101 & CZ1000
MIDI
DIGITAL
POLYSYNTHS
IN STOCK
NOW
only £345 & £495
0% Interest free
credit available

SESSION

Central London Main Agent for Britain's best selling Combos

75 112 Lead Combo	£239
75 210 Lead Combo	£272
100 112 Bass Combo	£289
100 115 Bass Combo	£324
100 410 Bass Combo	£342
85 112 Lead Cab	£115
85 112 Bass Cab	£115
100 115 Bass Cab	£164
100 410 Bass Cab	£195

all prices inc p&p

Dual footswitchable channels. Harmonic overdrive, accutronics reverb, celestion speakers, 3 band value type Eq.

2 year guarantee

W.H.S. New Multitrak Superstore

TASCAM

TEAC Production Products

244 PORTASTUDIO £695

Remotes, punch-ins, flight cases for 244 all in stock.

234 Syncaset	POA
122B Master cassette 2 speed	POA
32 Open Reel Master	POA
34 Open Reel 4 on ¼"	POA
38 Open Reel 8 on ½"	POA
M2-A 6/4 Mixing Desk	POA
M/30 8/4 Mixing Desk	POA

Enhancement Series in stock eg

PE-40 4 Band **4ch** Parametric	POA
PB-64 64 way Patch Bay	POA

plus all Teac multitrack accessories cleaners, demagnetizers, cables etc.

TASCAM MULTITRACK PRIMER
Well written, extensive book on how to get the best results from the smallest of setups.
£4.99 postage free

PORTA ONE

TASCAM
Ministudio

Four meters. Input mixing. Zero return. Electronic punch-in. Dbx noise reduction. At least ten tracks bounced down onto four.

£419 inc. power supply and P&P

FOSTEX

AUTHORISED DEALER
X15 Cassette 4 track £269
MN15 Compressor, and all effects and mixers.
PHONE FOR DETAILS

Roland MC-202
MICRO
COMPOSER

inc free spool type data cassette & leads
SYNTHESIZER. Same specification as SH - 101. Saw tooth. Square wave Sub oscillator pulse width mod. CV & gate. Full spec MOD. VCF & ENV.
SEQUENCER: 2729 note capacity. 2 channels. Assign Bar No.3 step time, real time, tap time, delete bars & wrong notes, incert new ones, add accent & portamento to both channels, tape save LCD readout for memory check. tempo and mode.
TAPE SYNC. Will put down and run from a sync code on tape, separate sync out will run drum machines e.g. TR606, 707, 808, 909 KPR77 & DDM 110, from inc clock or tape REDUCED TO ONLY

£169

£339

YAMAHA MT44 ..... £309
Other bits in stock

MIXERS (See Tascam & Fostex)

MTR 6:4:2 Unbeatable value	£199
BOSS 6:2 Pan E.Q. Effects	POA

DIGITAL DELAYS

Roland SDE 1000	POA
Roland SDE 3000	POA
Boss DE 200	£259
Boss DD 2 Pedal	POA
Ibanez DM 200	POA
Ibanez HD 1000 Harm	£319
Yamaha Midi	POA
Maxim Dual Delay	£165

ANALOG DEL

Evans EP 100	£89
Evans Mini	£69
Boss DM2	£69
Rozz R-8	£49
200 m.s.	

REVERBS

Great British Spring	£229
Accessit Spring	£132
Vestafire Spring 19"	£219
Aces Spring 19"	£89
Yamaha Digital R1000	£398

COMPRESSOR'S/NOISE GATES

FOSTEX 3070 Comp limiter 19"	POA
Vestafire 19"	£225
Accessit Compressor	£52
Accessit Noise Gate	£52
Yamaha Compressor Limiter 19"	£239

MISCELLANEOUS

MPC Sync Trac (Drum Machine-Tape) £39
Headphones ..... from £15
Mikes. Shure. Audio technica
Prices start from £25
Boom stands from £18
Many other effects and accessories in stock
Phone for prices

No Stamps Required

To: Soho Soundhouse Mail Order Freepost 38 London W1E 6QZ or Tel

Please send me Model No(s)
I enclose cheque/postal order for £
debit my Access/Visa account No

P & P inclusive in all prices
24 hour despatch
Cheques 7 days
Telephone orders welcome

Name
Address

EMM 6 85

XRI Micon System Controller

MIDI Software for Spectrum Micro

At last, Sinclair's humble budget home computer gets a MIDI software package that stretches its capabilities to their limits. Minor criticisms aside, it's damn near perfect. *Simon Trask*

Despite its twin attractions of being both widely used and modestly priced, Sinclair's Spectrum home computer hasn't exactly been a massive hit with the MIDI software writers. But XRI Systems' Micon package, a step- and real-time sequencing affair for the 48K Spectrum that retails at a fairly modest £108, has been flying the Sinclair flag for some while now. It comes complete with a custom-designed MIDI interface, an unexciting-looking black box which connects directly to the Spectrum's user port and has one MIDI In, two MIDI Outs (useful if your synth has no MIDI Thru and you want to include a MIDI drum machine in your setup) and Sync In and Out. Actually, Sync Out isn't used by this particular package, finding use instead (so I'm told) in another XRI product. Both MIDI and non-MIDI drum machines (the latter at 6, 12, 24, 48 or 96 pulses per quarter note) can be used to control either sequencer.

Star attraction of this particular show, with its musical notation score display and extensive editing facilities, is undoubtedly the step-time sequencer, its real-time counterpart enjoying, in truth, the status of bonus feature.

Quick Step

The Micon step-time system allows you to input eight monophonic tracks, each of which may contain up to 2950 events or steps, giving a total capacity somewhere in the region of 24,000 events – these are all dedicated to the single sequence that can be resident in memory at any given time. Each track can be independently assigned to one of the 16 available MIDI channels, too, and that should be adequate for just about anybody's MIDI setup.

Just in case you're wondering, an 'event' is *not* synonymous with a note in this context. It simply defines the shortest note length to be used on all the tracks, and is selectable from demisemiquaver through to crotchet. Thus, with a quaver-length event selected, you get upwards

of 360 4/4 bars per track – a pretty fair number to be going on with, I'd say.

Pitch input is taken from a MIDI keyboard, while duration and gate settings (more on these later) are taken from the Spectrum's QWERTY keyboard. You can enter rests by keying the zero key on the Spectrum once for each event, and you can also select individual tracks for monophonic input, or any number of tracks (up to the full eight) for working in glorious, technicolor polyphony.

> 'Star of the show is undoubtedly the step-time sequencer, with its musical notation score display and extensive editing facilities.'

Once you've input a pitch from the MIDI keyboard, you enter duration by tapping either the space key or 'q' once for each event duration. Why a choice of two keys for input? Well, the system gives you a choice of two gate settings, ie. the length of time per duration that a note actually sounds. Broadly speaking, this enables you to choose between legato and staccato notes, with the space key selecting the former and 'q' the latter. Each setting can be selected from a wide percentage range, the only restriction being that the 'legato' setting has to be a higher value than the 'staccato' one. Fair enough.

Finally on the features front, velocity information can be accepted from any synth capable of sending it, or it can be input manually from the Spectrum keyboard on a scale of one to eight.

The program's command level is handled on the bottom line of the screen, where lurks the unfortunately 'computerese' prompt: `file id buff inp code`. However, XRI do a nice line in concise commands – very few of Micon's are more than two characters in length. In fact, moving between Record and Edit modes is so easy that the distinction between the two becomes blurred, itself a reflection of the fact that the editing facilities are so comprehensive that they rapidly become an important part of the compositional process. And a nice feature of the 'bottom-line processing' approach is that the music score remains on screen almost constantly – just one of the features that makes the system easy and fun to use within only minutes of your getting it out of its box.

Visual Appeal

One of the step-time sequencer's most appealing features is its music notation display. This takes the form of the standard treble and bass clef pairing, with two bars displayed on the screen at any one time if you select a quaver event duration (I'll leave you to work out what you get with other event settings).

But what I ought to point out straight away is that this system *doesn't* pretend to be a 'scorewriter' program. The score display is intended simply as a clarification of the music you've entered, a rôle it fulfils admirably. Featurewise, you're able to scroll backwards and forwards through the entire length of the music you've entered, or position yourself at any bar, the current position being indicated on screen at all times. Any selection of the eight available monophonic tracks can be displayed during Record, Playback or 'non-active' modes, and you can start recording from any bar (providing you first position yourself at that bar), with the display being updated after the input of each note (or chord) and its duration.

Like I say, though, the music display hasn't the thoroughness of a custom-written piece of scorewriting software, because a number of transcription details simply can't be accommodated. Thus, you have to do without such niceties as leger lines, beamed notes, contextual designation of sharp/flat notes, key signatures, rest designations, or upward *and* downward stemmed notes. And to be fair to XRI, you can't really expect that sort of detail *and* MIDI processing *and* a decent amount of note storage from an eight-bit machine like the Spectrum. The designers are also first to admit that real-time scrolling of the score impairs the timing of the music in Playback mode, which is why they've included a facility that lets you turn the scrolling off.

> 'A thoughtful inclusion – not so thoughtfully implemented – is the facility to decide precisely *what* MIDI information you want the system to receive.'

Step Editing

Not surprisingly, the score display also makes step-time editing a lot easier than it otherwise would have been, with the editing commands interacting with the display using the same vertical shaded bar that indicates the current position in the music.

Top line of the display indicates the current command, the current base track together with the number of tracks in use, the number of the current bar, and the tracks currently being played/displayed. And since many of the editing operations are carried out on a single track, it's nice to have the option of being able to focus in on that track, visually as well as aurally.

Gripe time. If you reselect an already recorded portion of a track, it's recorded over automatically without any kind of warning. I can't help feeling some sort of Track Protect function would have been a good idea, but there you go. Some way of recording on *any* track, rather than the present system of allocating adjacent tracks upwards from a basic track, would also have been handy.

But the system's biggest failing lies in the looping department. You can set a loop point anywhere within the music for playback purposes, but the loop can only return to the start of the piece. This is plainly silly, when a little extra effort could have conjured up a definable start point for the loop (or wrap, as XRI call it) as well.

Enough of what Micon hasn't got. What *do* its editing facilities offer? Well, notes and rests can be inserted or deleted from any part, and any single note or rest can be altered by keying 'a' and inputting the new pitch from the MIDI keyboard. Either of the two available gate settings may be assigned to any note individually, as may velocity-sensitivity. Whole bars may be erased in one go, while the 'KILL' facility is as dramatic as its name suggests: it completely erases the entire sequence. Individual tracks may also be transposed up or down in semitones, the only limitation being that the resulting pitches must be within the displayable range (this facility works on a minimum of one bar).

In total, up to 80 patch-change assignments can be distributed across the eight tracks, and once inserted, they can be altered or deleted easily, should you be of fickle disposition. What's more any bar or number of bars can be copied from one place to another, and you can also specify which individual tracks a repeat will operate over. Very useful.

Finally, when you have a piece just the way you want it, the Micon package allows you to save complete step-time sequences or individual tracks to a choice of cassette or Sinclair microdrive. Incidentally, XRI provide keen microdrive users with the means to make a backup copy of the program onto a drive, and to catalogue the contents of a drive from within the program.

MIDI Manipulations

Determined to allow for every eventuality, XRI have made provision for a track-specific MIDI Mode message to be sent during Playback in the step-time system – though make sure you know your MIDI codes (in decimal), as this is how you have to select each message.

On step-time power-up, an Omni/Poly On MIDI message is sent out on Channel 1 – this message is also sent every time you key 'x' followed by ‹ENTER›. As 'x' is used to exit from Record and Playback modes, it would appear that Mode settings (which also act as All Notes Off commands) are used to ensure that sequences are terminated cleanly. This worked fine with a DX7 and a Casio CZ5000, but keying ‹SYMBOL SHIFT› and 'x' in the Real Time sequencer (to cut ▷

MICROSOUND DIGITAL MUSIC SYSTEM

THE FIRST PROFESSIONAL DIGITAL SAMPLING SYSTEM FOR THE COMMODORE 64

SYSTEM SPECIFICATION

Sample recording
User definable trigger level, trigger delay, input filter level (bandwidth 4–15KHz), and sample rate (4–33KHz).
Real time bar graph display of input level with clipping indicator.

Sample editing
Mix, reverse, loop or delete any part of the sampled sounds.
The full 40K sample memory displayed on one screen, complete with two sets of start/finish pointers and the edit cursor.
Select any section of memory for the storage/playback of samples.

Sample playback
Via Microsound 64 keyboard. Envelope/LFO control of amplitude, LFO rate controlled in real time by the keyboards slider control.
Programmable output filter level and looping on/off function.
Samples played back over the full 4 octave range with no distortion.
Split keyboard facility allows all the aformentioned functions to be programmed for EACH half of the split.
Via QWERTY keyboard. All the above except LFO modulation.
Via MIDI. As QWERTY but with programmable MIDI channel allocation.

Sample storage
The 40k sample area can be saved directly onto disk along with all the user defined variables set up in the program (eg. envelope levels, filter levels etc.) This allows the sounds to be loaded and played back exactly as they were set up originally. Files may be deleted if necessary.
A catalogue of the sound files on the current data disk is also displayed.

Hardware
A robust, compact unit measuring just 230 × 120 × 35mm.
Built in MIDI interface for the reception/transmission of MIDI data.
Pre/de-emphasis circuits to eliminate quantitisation noise.
Programmable 24dB anti-aliasing (distortion) low-pass filter, bandwidth variable between 4 and 15KHz.
Digitally controlled output amplifier for real time envelope/LFO modulation.
Input amplifier with adjustable input level, suitable for mic or line signals.
Output volume control and power on/off switch.
Power supplied either by battery or optional AC adaptor.
Connection via COMMODORE 64 cartridge port.

System described above (excluding keyboard) ONLY £299 inc. VAT and P & P

7 days money-back guarantee
Dealer enquiries welcome

Microsound 64 keyboard and SiD-based polysynth software (still the best available) NOW ONLY £149 inc. VAT and P & P

Microsound Ltd., Orchard Dene, Lower Assendon, Henley-on-Thames, Oxon Telephone: Henley (0491) 575469

Musical Exchanges

(BIRMINGHAM)

THE LARGEST MUSIC STORE IN THE UK PROUDLY ANNOUNCE THE FINAL PIECE TO THE JIGSAW

ROLAND MAIN DEALERSHIP

WE HAVE ALL ROLAND & BOSS PRODUCTS IN STOCK AND ON DISPLAY IN OUR 6000 SQ. FT. MEGA STORE! PART EXCHANGES WELCOME. HP FACILITIES AVAILABLE PLEASE CALL OR PHONE:

MUSICAL EXCHANGES

MUSICIANS CORNER, 89 OLD SNOW HILL, BIRMINGHAM B4 6HX.

TEL: 021 236 7544

short playback of a sequence) caused an Oberheim Matrix 12 to take umbrage, shutting off all its voices and blinking its display windows. No, I can't explain it, either.

As an added operational bonus, you can tailor XRI's program to your own requirements by changing the data governing Mode selection and then saving your own version of the program. This means that if, for instance, you're the proud owner of one of Sequential's multi-timbral wondersynths or a synth with split-keyboard capability and separate MIDI channel assignment (a Jupiter 6, say), you can tailor the Micon system in accordance with your particular MIDI setup. Definitely worthwhile, that.

> 'You can tailor XRI's program to your own requirements by changing data and then saving your own version of the program.'

Real Time

Away from the Micon's showpiece program and on to more mundane fields of play. XRI's real-time sequencer program gives you a one-track polyphonic recorder that allows you to hold a maximum of 10 sequences in memory at any one time; the good news is that memory allocation is dynamically controlled. And as well as the usual note on/off commands, the program can store patch change, pitch-bend and mod wheel information.

The real-time system's menu page presents a far from stunning range of Record, Play, Load Sequence and Save Sequence options, along with a 'Change info' option which enables selection and adjustment of various control options governing sync and timing. The page also displays sequence numbers currently used, together with the amount of buffer space used (expressed as a percentage), with the buffer space figure being updated at the end of each sequence input.

Particularly neat is the way the system lets you derive a metronome pulse from your synth at any pitch within the MIDI range. Not ideal, maybe, but infinitely preferable to the Spectrum's tinny beep. Alternatively, you can choose between either MIDI or non-MIDI sync options. In the case of MIDI sync, Micon controls the MIDI drum machine in Record mode, but can be controlled *by* the drum machine on playback (beware, you'll have to do a bit of lead-swapping to achieve this).

If you doubt your performing dexterity, you can preset an auto-correction facility to crotchet, crotchet triplet, quaver, quaver triplet, or semiquaver levels, though as none of these is compulsory, mistakes are still a realistic possibility if you want them.

A thoughtful inclusion – not quite so thoughtfully implemented – is the facility to decide precisely *what* MIDI information you want the program to receive. So if, for instance, you decide you want Micon to recognise MIDI System Exclusive data, it's possible to use a sequence for storing patch dump data, which can be stored on tape and subsequently reloaded into your synth simply by playing the sequence in question. I tried dumping and reloading all the internal voice data of a DX7 and encountered no problems, though you've got to time your button-pushing with some precision to get things the way you want them. One 32-voice dump used up around 15% of sequencer memory, which isn't bad.

However, the implementation hiccup lies in the fact that you have to key in one of three MIDI status byte values (listed in the manual) in response to the system's `ignore` prompt; the program will then ignore all status bytes with a value higher than this figure. This is something of a programmer's approach to things, caused by over-exposure to (a) the workings of the program and (b) the data manipulated by that program. The poor old musician, meanwhile, has to do without a higher level prompt that could have related to a more generalised understanding of MIDI. Still, that aside, the system gets full marks for clarity and ease of use, so you can't really complain.

What's *really* inflexible is the way you can only delete the last sequence you recorded. If you're about to embark on your tenth sequence and you want to make some more room in memory by deleting the first, you're going to have a problem or eight.

It would also have been nice to have an Append function along the lines of that introduced by Sequential on their Multi-Trak synth (see review, E&MM May), whereby one or more sequences can be incorporated onto the end of another sequence.

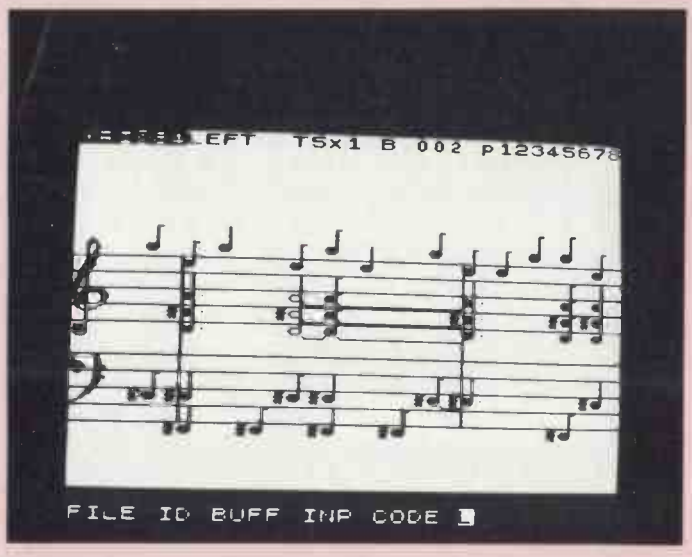
Conclusion

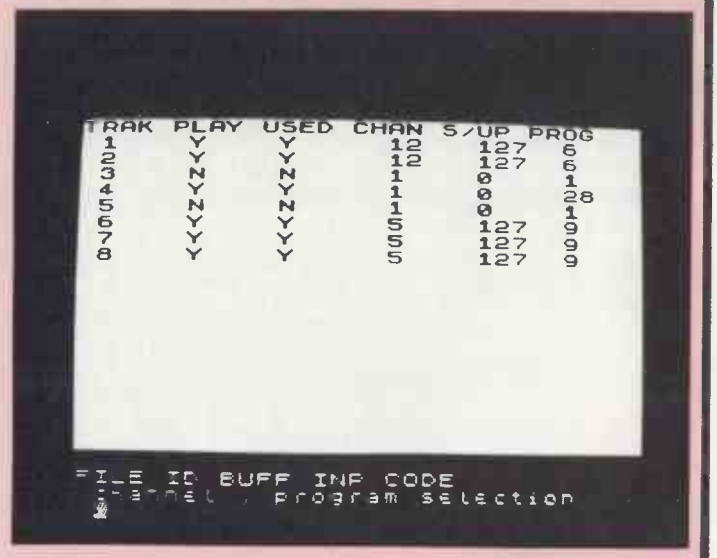
The step-time sequencer is one of the most carefully thought out and easy-to-use systems currently available, no doubt about it. And the fact that XRI have managed to cram it all onto a Spectrum only makes it a more praiseworthy achievement.

Its appeal lies partly in its clear, effective use of graphics and partly in an overall design format that prevents the software from ever imposing itself on the musician using it. The editing facilities are thorough and sensibly implemented, to the extent that even if you've never used a piece of MIDI sequencing software before, you find yourself building up complex pieces very quickly.

In some ways, XRI have accomplished a lot of difficult programming tasks without attending to some of the simpler ones, with the result that the real-time side of the system lacks a number of facilities that would be a piece of cake to incorporate. That's also true of the step-time system (though to a much lesser degree), but then again, the great thing about software is its inherent open-endedness. XRI have already done an admirable job on the Micon, and they deserve every encouragement to continue the good work. ■

Further information: XRI Systems, 10 Sunnybank Road, Sutton Coldfield, West Midlands. ☎ (021) 382 6048.





KEYBOARDS

Roland main dealer – all the latest Roland equipment in stock.
Piano Plus Series – MIDI modular System – Sequencers
New JX8P Synth+PG800 programmer £1430
SPECIAL OFFER SH101 MONO SYNTH/SEQUENCER £199
Yamaha PF10 – PF15 – DX7 – DX9 – CS01. Always in stock.
Korg, all models in stock, best prices.
Home Keyboards – Full range of Casio & Yamaha
★New Casio CZ101 Amazing ..... only **£345.00**★
★New Casio CZ1000 ..... **Delivery imminent**
★Yamaha PS61000 ..... only **£989.99**

DRUM MACHINES

Roland TR707	£525	Boss DR110	£135
Korg Super Drums	£239	Korg Super Percussion	£239
Yamaha MR10	£89		

AMDEK Percussion Synth Kit
£29.00
Reduced from £70.00. Post Free

★All Drum Machines Mail Order – Post Free★

AMPLIFICATION

Large choice of PA, Guitar, Keyboard & Bass Amps from Roland, Marshall, Peavey & Carlsbro – including:

CARLSBRO GUITAR COMBOS		**PEAVEY GUITAR COMBOS**	
Scorpion	£109	Audition	£83
Hornet 45	£162	Backstage Plus	£129
New Cobra 90 Twin	£238	Studio Pro	£175
Stingray 150	£353	Bandit	£229
CARLSBRO BASS COMBOS		Special	£290
Hornet 45	£151	Renoun	£344
Cobra 90	£216	Encore 65	£288
Stingray 150	£339	**PEAVEY BASS COMBOS**	
CARLSBRO KEYBOARD COMBOS		Basic 40	£153
Hornet 45	£182	TKO	£206
Cobra 90	£275	TNT	£283
Keyboard 150	£418	Combo 300	£429
CARLSBRO PA AMPS		**PEAVEY KEYBOARD COMBOS**	
Cobra 90	£186	KB100	£229
Marlin 6 150	£268	KB300	£344
Marlin 6 300	£358	Also Peavey Stacks×PA in Stock	
S600 Power Amp	£486	**MARSHALL**	
CARLSBRO PA SPEAKERS		New 100w Mosfet Compact	
1×10 1 horn	Pair £192	Stack	£540
1×12 1 horn	Pair £221	**MARSHALL TRANSISTOR**	
2×12 2 horns	Pair £328	**COMBOS**	
1×15 1 horn	Pair £248	12W Guitar	£80
2×10 1 horn Procab	Pair £358	12w Keyboard or Bass	£87
ROLAND		20w Guitar Bass or Keyboard	£115
Cube 20 Cube 40 Chorus		30w Guitar or Bass	£155
Cube 60 Chorus Cube 60 Bass		50w Guitar or Keyboard	£258
Spirits – all models in stock		60w Bass	£244
JC50 JC120		150w Split Channel Guitar	£258
New JC Head Now in		75w 1×12+rev Guitar	£276
HH		**MARSHALL VALVE**	
Available – all enquiries –		**LEAD COMBOS**	
Chatham Store		50w	from £258
		100w	from £276

HIRE

Wide range of PA, Backline, Drums, Drum Machines, Simmons, Home Recording Equipment, Phone for details.

GUITARS

Fender Squiers – lots in stock ..... from £199
Tokai Strats & Teles ..... from £199
Tokai Les Pauls ..... from £250
Aria Knight Warrior £299
★New Aria Wildcats – only £199 including hard case★
Washburn – Black & Red series £295
Washburn – White & Black Series £295
Washburn Electro Acoustics complete range in stock from £299
Ibanez – solids & basses all the latest models in stock £299
Westone Guitars & basses in stock lots to choose from starting at £99
Yamaha SG1000+SG2000+SG3000 Great deals always available

BOSS PEDALS		**WASHBURN PEDALS**	
Chorus	£74	Delay	£99
Delay	£99	Phaser	£45
Compressor	£62	Stack-in-a-box	£49
7 band Eq	£74	Chorus	£51
Heavy Metal	£45	Flanger	£55
Flanger	£79	Compressor	£45

All other Boss+Washburn Pedals in stock – always

★MAIL ORDER ALL PEDALS POST FREE★

CUSTOMIZING AND ACCESSORIES

All the top names in Guitar parts: Kahler, Fender, ESP, Seymour Duncan, Schecter, EMG etc
We also re-spray & refret, Pot Pick-ups etc etc
We fit Kahler Trem systems, B Benders, Necks & Roland Guitar synth conversions

DRUMS

Everything in stock and available for demonstration in our special Simmons Studio
SDSI ..... £217 SDS7 ..... £2156 EPB £340

SDS8 SPECIAL OFFER £560

Wide range of Drums, Latin Percussion & Cymbals. We stock: Ludwig, Mirage, Trak, Natal, Pearl, LP, Premier, Zildjan, Paiste & Rogers

Mirage 5pc	£249	Natal Congas	£299
Mirage Student 3pc	£175	Natal Bongoes	£89
Mirage Powerdrive 5	£375	**MIRAGE PERCUSSION**	
Mirage Chrome 5pc	£425	Roto Toms 6+,8+,10+, std	£99
Ludwig Standard 5pc	£599	Timbales std	£79 pro £125
Ludwig Modular 5pc	£1225	Bongoes std	£26 pro £49
Premier Kits	from £349	Congas std	£179 pro £199
Trak kits	from £395	Skulls set of 5 on std	£95
Pearl kits	from £425	Concert toms 8"+10"	£54
		Power toms 8"+10"	£77

MICS, MIXERS & OUTBOARDS

Full range of Shure, Sennheiser & Audio Technica mics always in stock
★Mail Order Post Free★
Mixers by Boss, Tscam & the amazing value for money range from Dynamix. Rack effects by Roland, Boss, Peavey, Ibanez, Yamaha & Carlsbro – all at great prices.

NEW TASCAM PORTA ONE – NOW IN STOCK ONLY £429

We also stock an enormous selection of spares including cabinet fittings, handles,converters, DI Boxes, Mic Transformers, Cables & Connectors

TASCAM 244 Portastudio £695
Dynamix 6>2 **172** ★ 12>2 **£258** ★ 16>2 **£368** ★
New SHURE Prologue series mics ..... **NOW IN STOCK**

MAIL ORDER

We provide an efficient mail order service for our customers on all the items we sell.
Please phone for any equipment you don't see listed, or for Postal charges
All pedals, Microphones & Drum Machines Post Free
Visa/Access Holders Phone

01-624 3900

for immediate despatch or send a cheque or postal order & allow 14 days for delivery

213–215 Kilburn High Road, London NW6. Tel: 01-6243900
48 High Street, Chatham, Kent. Tel: Medway 44068

THE FAIRLIGHT EXPLAINED

We leave the realms of sound-generation and turn our attention to the CMI's other great compositional asset: its versatility as a music production tool. *Jim Grant*

This month sees us moving onto a different aspect of the Fairlight's abilities: that of music production. These days, there are all manner of instruments employing digital techniques for the creation of sound, but few if any offer the comprehensive music-making facilities, both real and non real time, that the CMI has as standard.

The most obvious means of music input is of course *via* the music keyboard; Page 9, the keyboard sequencer, is shown in Figure 1. At first sight, this seems a little complicated, especially since all you expect it to do is to remember the notes played and their duration. But this is where the genius of the Fairlight really shines through. It is, after all, a powerful microcomputer with large secondary storage in the form of disks. (Or is it a musical instrument masquerading as a computer? I guess the answer to that depends on whether you're repairing it or playing it.)

```
INDEX                  ***  PAGE 9 READY  ***
COMMAND:

                    KEYBOARD SEQUENCER

REPLAY FILE: MEGAHIT  .SQ                          DISK ID: DEMO
RECORD FILE: MEGAHIT  .SQ                       FREE SPACE:   156

   SPEED:  10000     CLICK:  OFF              KEYBOARD SELECTION
    SYNC:  INT        RATE:   100                  MASTER:  1
                                                   SLAVE:   2

      INPUT STREAM TO     1  2  3  4  5  6  7  8
      KEYBOARD NUMBER:    1  2  3  4  5  6  7  8

        REPLAY TRIM                      CONTROLS & SWITCHES
        HEAD:     0                         RECORD:    ON
        TAIL:     0                         REPLAY:    ON


           RECORD      STOP      REPLAY      MERGE
```

Figure 1.

Recording

To record a music sequence, the CMI opens a file on the user disk with the name specified in the Record File area. It automatically suffixes the letters SQ after the name, to distinguish it between voice (.VC), control (.CO) and instrument (.IN) files.

Once the Record command is given, the CMI begins building a file in RAM with the information received from the music keyboard. Remember that the Fairlight is a distributed processor system and that both the music and alphanumeric keyboards contain micros of the 6800 family doing all the work. Normally, the music keyboard acts as a host for the alphanumeric data, and passes both it and the music information at 9600baud to the CPU. But just in case of confusion, differences between ASCII text and keyboard notes and velocities are highlighted by a flag contained in the data. On receipt of the serial data stream, the CMI sorts out the source and stores the music information in RAM.

All of this takes place unseen by the musician, and quite rightly so, but here's the clever bit. Most digital instruments have a limited amount of RAM that can be released for sequence information, something that's soon consumed whenever the user attempts layering complex polyphonic music. The CMI not only has double-sided disks to store information, it also uses Page 9 software to dedicate Processor 2 in the CPU to detect when the note buffer (built by Processor 1) is half-full and then write the sequence data to disk, emptying the buffer as it does. The upshot of all this is that you can play away to your heart's content, in the certain knowledge that the memory represented by the disks amounts to a total of more than 50,000 notes. It's for this reason that the size of a Page 9 sequence is unknown when they're first opened. And while recording is in progress, the file is dynamic and grabs as much space as it needs until the Stop command is given.

Replaying

In Replay mode, Processor 2 reopens the sequence file and reads a chunk of it into RAM. Processor 1 acts upon the data and generates the notes and timing information, subsequently passing them to the channel cards. Again, when the buffer is half-empty, Processor 2 gets a signal and reads in the next block of data while Processor 1 carries on with the business of playing music. It's all terribly clever, and, in fact, fascinating to watch

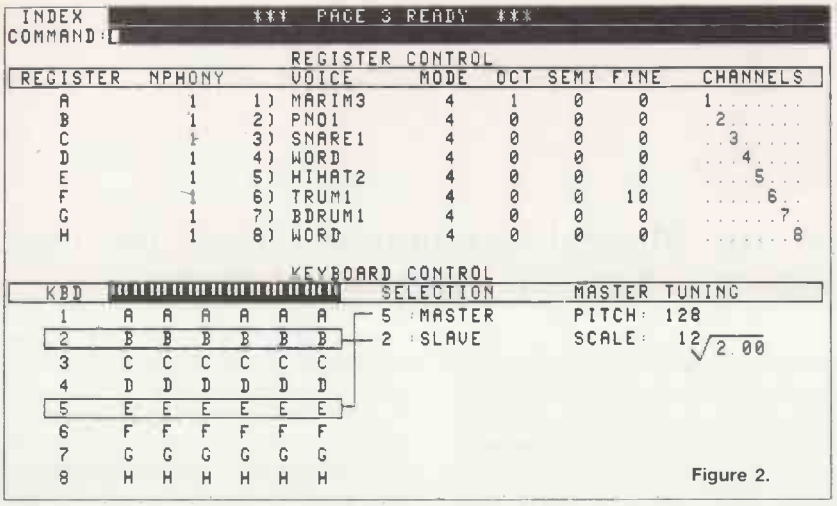


Figure 2.

the different processes come into play (no pun intended) as the music progresses.

Well, that's how it all works. How do you actually work *with* it? Recording and Replaying a file is simply a matter of specifying the name in the designated areas and hitting the displayed command with the lightpen. When the Stop command is given, the CMI closes the sequence file; if recording was in progress, it also updates the Free Space number shown in Figure 1.

The Replay Trim component is very much like the start and end leader on a reel of tape; Head Time is the time from the beginning of the sequence to the first event; and Tail Time is the time from the last event to the end of the sequence. These can be adjusted after the sequence was recorded, and saved with the file on disk.

A variation on the Replay command is the Repeat function. In this case, the head and tail times can be adjusted as the sequence is playing to obtain a smooth repeat.

Of course, it's often desirable to layer or multitrack sequences, and this can be done with the Merge command. Here, two named files must be specified with the Replay file (including the Repeat option) while a new Record file is built on disk containing information as played on the keyboard and the data from the Replay file.

Controlling

But in addition to holding music information, the Record file can also act as a memory for control data generated by the three sliders, three footpedals and five switches that are associated with the Fairlight's music keyboard. This allows performance information such as swell, vibrato and so on to be sent to the disk along with the notes and their durations.

It's possible to mask the effects of these controls on both Record and Replay. This is particularly useful, as it allows you to Merge several pieces of music with the controls and switches off, and then create a final Merge file with the controls and/or switches adjusted to alter the sound. The movements are recorded on disk along with the previously-recorded music.

Time in the sequencer is measured in microbeats, and the Speed control defines the duration of a microbeat as a number of system clock cycles.

As you'll no doubt be aware, a good many digital musical instruments – especially drum machines and their ilk – have some means of synchronising their tempo with an external signal generated by another instrument. This is commonly a click or a sync tone, with the clicks being short voltage pulses which occur on every beat.

However, that sort of syncing system is now falling out of vogue, as it was originally conceived to replace the gate signal on voltage-controlled machines such as sequencers. Perhaps the method's single biggest disadvantage is that due to its low repetition rate, it can't be recorded directly onto audio tape.

The cure to all this is the sync tone, a pulse train whose frequency is related to the number of beats per minute being output by the machine(s) in question. This makes it suitable for recording directly, as the number of pulses per beat is usually between 12 and 96.

After all that, what do you know? The CMI doesn't even give a Sync Out pulse, since a sinusodal voice can be pressed into service whenever required. It does, however, accept a Sync In signal. Figure 1 shows that internal microbeat drive is elected, but this can be changed to external (or EXT), enabling the CMI to count external sync pulses to drive the sequencer. A Click Out facility is also present, and this can be useful for providing a metronome beat if you're attempting to record a particularly difficult passage, for example.

Selecting

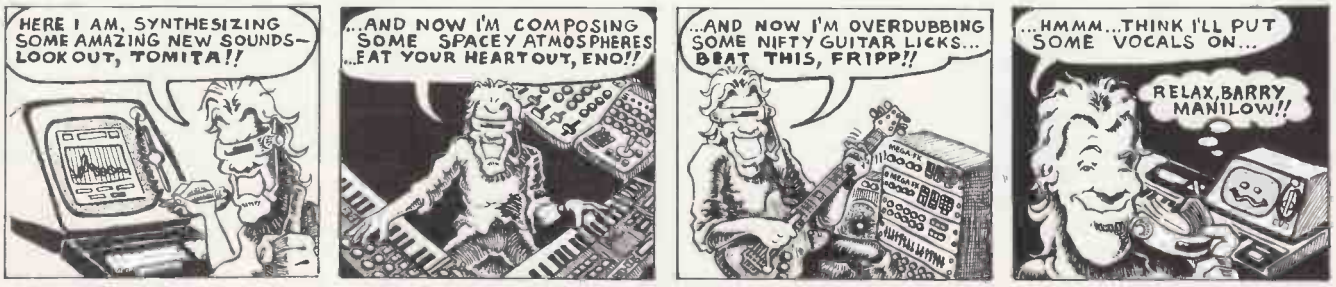
The Keyboard Selection facility is related to Page 3, and Figure 2 shows an example of this just to jog your memory. If you remember, there are eight keyboard maps on the Fairlight, all of which the master and slave keyboards can be set to control.

Changing the numbers on Page 9 causes the selected keyboard to leap onto the chosen map displayed by Page 3. This is quite important, since if you think of Page 9 as an eight-track recorder, the keyboard number becomes the number of the track on which you're about to record.

The Fairlight calls its recording tracks Input Streams, and the table shown on Page 9 (Figure 1) allows you to govern which stream will play which keyboard in Replay mode. Remember, Page 9 records key events, not sounds, so you can dynamically swap the mapping of music to sounds during a piece by changing the stream-to-keyboard allocation.

But imagine an eight-track tape recorder with an individual instrument recorded onto each separate track. Naturally, the sound of each instrument is bound in separately to the music laid down on its particular track. Not so with the Fairlight. By changing the input stream-to-keyboard number, you can use the music recorded on Track 1, say, to play the sound associated with Track 5. During a Merge, this dynamic allocation of streams can be turned off simply by assigning it to a ficticious Keyboard 0. It sounds like cheating, but it's helpful nonetheless...

That about wraps it up for Page 9. It's a powerful and flexible recording tool that was an awful long way ahead of its time when it first appeared a few years back. It has only one problem. It's easy to use if, and only if, you have a reasonable amount of keyboard-playing skill. If you haven't...well, maybe you'd better wait for next month's *Fairlight Explained* instalment. ■



FAIRLIGHT GOES MIDI

Two years after its inception, the Musical Instrument Digital Interface finally finds its way onto the Fairlight CMI. *Paul Wiffen*

Aside from the odd brief chat with a passing Minimoog or Prophet courtesy of its built-in analogue interface, the Fairlight has done very little in the way of communicating with the rest of the synthesiser world during its eight-year history. Which is a shame, because the CMI's Page R sequencer was one of the few such packages to give some display of rhythmic value in musical terms, and in the past, its versatility could only be applied to sounds that had been synthesised or sampled on the Fairlight itself.

Well, now all that has changed, thanks to Fairlight's engineers taking the decision to implement MIDI. This is a pretty shrewd move, as the interface is now a good bit more widely used in pro studio applications than its opponents would prefer to believe. And the system hasn't just found favour with the major polysynth manufacturers; some of the bigger league machines such as the Kurzweil and Emulator II already have MIDI fitted as standard, and that's something Fairlight simply couldn't afford to ignore any longer.

Packaging

What I really ought to make clear from the outset is that the Fairlight's version of MIDI isn't just something that's being fitted to the latest production models, because the hardware and software necessary to make the CMI MIDI-compatible is available as a retrofit for existing Fairlight owners as well. One such owner is Fairlight afficionado and occasional Helden member Hans Zimmer, whose studio – Lillie Yard – is currently home of the first MIDI-equipped CMI in Britain.

So, off go Wiffen and battered Cortina in the direction of Zimmer's abode, hoping to find true interfacing love and happiness. And by and large, that was precisely what we found.

The hardware consists of a large metal box that's affixed to the rear of the Fairlight's main unit, and houses no fewer than four MIDI Ins and a similar number of Outs – one for each separate port. There's SMPTE In and Out, too. As for the extra software, this is accessed through a new option on Page I, and comprises four separate display pages (or Sheets, in this instance). Cunningly, these are got at by typing a number between 1 and 4 on the Fairlight's QWERTY keyboard.

In fact, the first of these Sheets isn't actually concerned with MIDI at all. Instead, it deals with the generation of and synchronisation to the SMPTE code. As anybody who read the final instalment of *Everything but the Kitchen* (E&MM February) should know, SMPTE has now become the industry standard for synchronising film, video and audio tape signals, so it's a natural for an instrument like the Fairlight that finds itself being used in an awful lot of audio-video applications.

Anyway, the top half of this sheet shows the clock rate generated in hours, minutes, seconds and frames (which can be at a rate of 24, 25 or 30 per second according to film, European video and American video standards respectively), and is also capable of displaying the date of the session you're currently working on, should you choose to enter this information into the machine before you set the ball rolling.

Immediately above is a further readout that displays the user-selectable SMPTE offset. For those not in the know, this parameter comes into play when you need a code that doesn't start at zero hours, minutes and seconds, so it obviously comes in useful when, for instance, you want to dub a section halfway through a film or video.

The lower half of the sheet shows the incoming SMPTE clock, and this is decoded in the same format as the outgoing data, so you can see exactly how far through synchronised playback you've progressed. And with a thoroughness that's now become one of the company's trademarks, Fairlight have ensured that their version of SMPTE can be used to drive any of the CMI's sequencing pages, which is good news.

MIDI Routings

It's on Sheet 2 that we find MIDI routing details of the four ports and the 16 serial channels that each one can independently assign. The first of the four is intended to be used exclusively for Fairlight's new Master Keyboard, which'll use MIDI to send velocity- and pressure-sensing data (amongst other things) to the connected sound-generating hardware. Don't worry – the keyboard hasn't arrived on these shores yet, and as soon as it does, you'll read about it here.

Sheet 2 also allows different MIDI protocols (or dialects, as some people seem to have taken to calling them) to be assigned to the remaining three ports. Currently supplied are protocols for Fairlight, Yamaha and SynthAxe, so that for instance, you can perform previously impossible feats like playing a Yamaha TX816 MIDI Rack from one of Bill Aitken's hi-tech guitar wonders.

This separate protocol arrangement starts to really come into its own on Sheet 3. Basically, this page lets you assign any of the MIDI controllers to the Fairlight's system of switches, sliders and pedals. And what that gives you in practice is an extensive and versatile controlling network (similar to that provided by Yamaha's KX88 Master Keyboard) in which any synth parameter given MIDI access by its designers can be altered using the Fairlight's controllers.

Finally, Sheet 4 endows the CMI with the ability to delve a little deeper into MIDI's internal workings, and to show the results of those delvings on-screen for the benefit of the end user. Thus, you can fill the Fairlight's screen display with incoming MIDI signals, listed in hexadecimal code and separated according to which port they're entering the Fairlight through. You can also freeze an incoming signal if you're interested in analysing the precise MIDI message it contains.

Of course, you're going to need to be pretty well clued-up on the way MIDI information is exchanged to extract much usefulness from this facility. Personally, I reckon the people who'll use it most are probably Fairlight's engineers, as it'll allow them to take a peek into just about every MIDI protocol currently being implemented. Hence Sheet 4's vaguely apposite sub-title 'DeBug'.

Summary

The first thing to get across is that this update package provides a neat and convenient implementation of two very different industry standards – SMPTE and MIDI. That alone will no doubt earn it 'must buy' status for many First Division recording studios, especially as more and more of them become attuned to the sort of compositional versatility today's hi-tech musical instruments can provide.

More important for Fairlight's musician ownership are the dual benefits of increased Page R sequencing versatility and the implementation of different MIDI dialects. Now you can hook up *any* MIDI sound source (analogue, digital, FM, you name it) to one of the world's most flexible sequencers, without fear of MIDI incompatibility casting its all-too-familiar shadow over the proceedings. Overdue, but well worth waiting for. ■

Further information: Syco Systems, 20 Conduit Place, London W2. ☎ 01-724 2451.

THE ART OF GOING SOFT

Part Two of the series that takes the mystery out of writing music software for home computers. *Jay Chapman*

We said last month that we don't intend *The Art of Going Soft* to be a programming course for beginners as such. For one thing, we haven't anything like enough space, and for another, the exercise would be fairly pointless anyway, as the individual micro user guides and magazines make a much better job of introducing newcomers to programming than we're ever likely to.

What we can do is provide basic algorithms (ie. descriptions of how to perform tasks) that relate specifically to musical programming. As your experience grows, you should be able to start putting some of these routines together with your own code to produce useful music-related utilities. Or at least, that's the idea.

Our first example routines deal with the common requirement to convert a note name (something like 'C#6'), which we might use outside a computer program, into an internal key number that can be more easily manipulated within the program. The key numbers you allocate to note names could be quite arbitrary, but we'll use the MIDI standard as our particular guide, mainly because it'll prove useful in later pieces of software.

Briefly, what the following two procedures do is enable ordinary musicians to input note information to a computer in an easily accessible and friendly way. All you do is key in the normal note name, and the procedure `read_note` (program lines 30 to 157) reads it and converts it into a key number. Similarly, if you want to view the results of your internal manipulations of musical notes, the last thing you want is the answer in the form of a key number; that would just confuse the issue by forcing you to convert 97, say, into its note name in your head. So, we have a second requirement, satisfied by procedure `write_note`, of converting key numbers back into note names. Simple, really.

Clive Goodyer

MIDI Key Numbers

First, a limitation. Because MIDI data bytes must have the sign bit set to zero to distinguish them from MIDI status bytes, we only have seven bits available to represent the key number. This gives us the range of numbers from 0 (binary 0000 0000) to 127 (binary 0111 1111). Now, MIDI specifies Middle C – which we would write as 'C3' – as Key Number 60, so we can represent note names from 'C-2' (0) to 'G8' (127). The correlation between note name and key number is shown in lines 51 and 52 of the program listing.

How can we make use of these key numbers in our program? Well, key numbers are going to be useful if you want to create a chord based on a particular note, for example. It doesn't take too much thought to work out that a major triad based on the note with key number 'n' as its root would be the notes with key numbers 'n', 'n+4' and 'n+7'. So, if the root note was 'C0', the chord would be 'C0' (24), 'E0' (28) and 'G0' (31). Not of earth-shattering importance, perhaps, but suddenly the idea of your computer program dealing with transposition, intervals, keyboard splits and random note generation should all start to seem a little less mystical. It might even teeter on the edge of the realms of possibility...

Let's try to work out how to program a computer to transpose up a perfect fifth from 'Bbb-2'. Given just those four characters stored in a string or an array, how do you progress? Well, life gets much easier if you only have to deal with the key numbers in programs. Numerically, the interval of a perfect fifth is always seven semitones. Exactly how the upper note of the interval is displayed as a note name for human consumption depends on the key signature, but all you have to do internally is add 7 to the original key number. So, if you have the key number for 'Bbb-2', which is 9, you just add 7 to give 16 (which `write_note` could convert to 'E-1' if you so wished). Simple, huh?

The Listing

Before we look at the two procedures in detail, let's deal with some general points about the listing. The program is written in Pascal rather than BASIC, for reasons I went into in last month's *Going Soft* introduction. And whilst specific features of Pascal will need some explanation, the general run of the code is sufficiently English-like to make some sort of sense at first reading.

Effectively, the program is a description of the algorithms that solve the programming problems we've set ourselves. Given this description you should, with perseverance, be able to implement your own version of the routines in whatever programming language you have available. The more comprehensive and 'high-level' the language, the easier it will be, of course.

The first line – `dcomp p.namekey o.namekey` – is a command to the Acorn ISO-Pascal system to compile the source code it finds in the file `p.namekey` and store the compiled program in the file `o.name_key`. Unlike BASIC, which lets you execute the program you've just typed in directly, Pascal requires that the source code be translated *before* execution rather than during it. If you have a Pascal system on your computer, the user manual should tell you how to organise the compilation.

The ISO-Pascal compiler announces itself on the second line of the listing, and what follows is the listing produced by the compiler as it translates the source code. The program is error-free and actually works(!) so there are no errors reported in the listing. The left-hand column of numbers is simply a list of line numbers that the compiler has added to the listing so that error messages can refer to lines

by this number. Unlike their BASIC brethren, Pascal source programs *don't* have line numbers when the program is edited into its source file.

The next column of numbers tells us whether the line of source we're looking at is at the main program level (0) or in a procedure (1). If a procedure had its own local procedures declared within it, they would be at Level 2, and so on. The third column, consisting of the characters '-' or 'C', tells us if the line is the second or subsequent line of a comment (C).

Program line 1 specifies that the name of the program is `read_n_write_notes` and that we'll be using the standard `input` and `output` files – in my case, that means the BBC Micro's keyboard and screen. Note the use of the underscore character ('_') to make identifiers (such as the program name and variable names) more readable where they are made up of two or more words. This facility is a very welcome extension added to ISO-Pascal by Acorn. Program lines 3 to 5 define the `constant` identifier `space` as a synonym for the space character; we'll see this used later in the program.

Lines 7 to 9 specify a `type` called `MIDI_key_number_T`. You should already be used to the idea that all variables and expressions in BASIC have a type (real and string are two examples), which defines what sort of data item the variables can hold or the expressions evaluate to. In fact, BBC BASIC has three different types, and variables are shown to be of a particular type by the addition of an extra character to the variable's identifier. So, the variables 'A', 'A%' and 'A$' are three different variables of type, namely real, integer and string respectively.

In Pascal, you can also define your own types, which you can use later in specifying the type of some variable you wish to declare. When a variable is declared to be of `MIDI_key_number_T`, as is the variable `internal_note` in line 13, it's only able to hold one of the values between 0 and 127 inclusive. Since there are no legal MIDI key numbers other than those in the range 0 to 127, the program stops with an error message if you try to assign a silly value to `internal_note`. Usually, it'll indicate where in the program the illegal assignment was attempted, too. You can then check the program out and find out why it's going wrong.

In BASIC it's often the case that the program will blunder on even if you do make some silly/illegal assignment, and end up producing an (incorrect) answer of some description. If the answer looks ridiculous ("your age is -3562564798 years"), you'll have good cause to check the program out for errors, but if the answer looks reasonable, you may well try to make use of it – with, ahem, disastrous results.

Anyway, back to the real world. Lines 11 to 14 declare two `variables`: `internal_note`, which we've just talked about, and `error`, which is of boolean type. The boolean type has only two values (*true* and *false*) which are often represented in BASIC by the numeric values -1 and 0 respectively. You'll see the variable used later in the program.

The Main Program

Having defined the global `constants`, `types` and `variables` that are to be visible – and therefore usable – from any point in the program code, we can go on to look at the main program body (lines 219 to 245). The main program is a fairly simple example of how the two procedures in question can be used, once they've made their way into your library of useful software routines. Lines 221 and 243 are the enclosing start and end of a `repeat_until` loop that never stops, so all the ▷

```
                    dcomp p.namekey o.namekey
                    ISO-Pascal compiler V. DO.GO

  1 0 - program read_n_write_notes( input, output ) ;
  2 0 -
  3 0 - const
  4 0 -
  5 0 -   space = ' ' ;
  6 0 -
  7 0 - type
  8 0 -
  9 0 -   MIDI_key_number_T = 0 .. 127 ; {MIDI data is 7 bits}
 10 0 -
 11 0 - var
 12 0 -
 13 0 -   internal_note : MIDI_key_number_T ;
 14 0 -   error         : boolean ;
 15 0 -
 16 0 - procedure read_iws( var ch : char ) ;
 17 1 -
 18 1 - {Reads, and returns via the parameter 'ch', the next 'useful' (i.e.
 19 1 C  non-space, non-newline) character. The suffix '_iws' stands
 20 1 C  for 'ignoring white space'.}
 21 1 -
 22 1 - begin {read_iws}
 23 1 -
 24 1 - repeat       {Eat any leading white space - }
 25 1 -   read( ch ) {the newline character reads in as a space in Pascal.}
 26 1 - until ch <> space
 27 1 -
 28 1 - end ; {read_iws}
 29 0 -
 30 0 - procedure read_note( var key_number : MIDI_key_number_T ;
 31 1 -                     var error      : boolean             ) ;
 32 1 -
 33 1 - {This procedure reads in one 'note name' from the standard input file
 34 1 C  (usually the micro's keyboard), converts it into the corresponding MIDI
 35 1 C  key number which is returned via the parameter key_number. The format
 36 1 C  expected is:
 37 1 C
 38 1 C                  1 [ # ] x | b[b] | = ] [+|-] n
 39 1 C
 40 1 C  where '1' is in 'A' .. 'G' or 'a' .. 'g' and
 41 1 C        'n' is in '0' .. '8'.
 42 1 C
 43 1 C  examples: 'C0', 'f#5', 'Ebb-2', 'Dx6', 'e=-2', 'Bb0', 'bb0', 'bbb0'.
 44 1 C
 45 1 C  If a 'name' is incomplete (e.g. 'C-') or illegal (e.g. 'F###+2', 'cb-2')
 46 1 C  then the caller is notified via the parameter error which is set true
 47 1 C  - error is set false otherwise.
 48 1 C
 49 1 C  The correspondence between note names and MIDI key numbers is:
 50 1 C
 51 1 C  note name : C-2 C#-2 D-2 ... B-2 C-1 ... C0 ..... C8  ... F8  F#8 G8
 52 1 C  key number: 0   1    2       11  12      24        120     125 126 127
 53 1 C
 54 1 C  Spaces and newlines (which read in as spaces) are skipped as necessary.
 55 1 C
 56 1 C  It is assumed that end-of-file cannot occur.}
 57 1 -
 58 1 - var
 59 1 -
 60 1 -   ch               : char ;
 61 1 -   read_next,
 62 1 -   octave_negative  : boolean ;
 63 1 -   octave_number    : -2 .. 8 ;
 64 1 -   check_key_number : -2 ('Cbb-2') .. 133 ('Bx8') ;
 65 1 -
 66 1 - begin {read_note}
 67 1 -
 68 1 - error := false ; {assumed - until we find out otherwise!}
 69 1 -
 70 1 - {Deal with the key letter.}
 71 1 -
 72 1 - read_iws( ch ) ;
 73 1 -
 74 1 - if ch in [ 'A' .. 'G', 'a' .. 'g' ] then
 75 1 -   begin
 76 1 -   case ch of
 77 1 -     'C', 'c' : key_number :=  0 ;
 78 1 -     'D', 'd' : key_number :=  2 ;
 79 1 -     'E', 'e' : key_number :=  4 ;
 80 1 -     'F', 'f' : key_number :=  5 ;
 81 1 -     'G', 'g' : key_number :=  7 ;
 82 1 -     'A', 'a' : key_number :=  9 ;
 83 1 -     'B', 'b' : key_number := 11 ;
 84 1 -   end ;
 85 1 -   key_number := key_number + 24 {octave calculations are relative to C0}
 86 1 -   end
 87 1 - else
 88 1 -   error := true ;
 89 1 -
 90 1 - if not error then {only do more work if not already messed up}
 91 1 -   begin
 92 1 -
 93 1 -   {Deal with '#', 'b', 'x', 'bb' and '=' (natural).}
 94 1 -
 95 1 -   read_iws( ch ) ;
 96 1 -   read_next := true ; {flag: 'read next ch - current ch already used'}
 97 1 -
 98 1 -   if ch = '=' then {natural}
 99 1 -     {Natural has no effect in this context so we ignore it. If you were
100 1 C      reading in notes in the context of a key signature you would need to
101 1 C      take the '=' (or even '=b' and '=#' into account.}
102 1 -   else
```

Pascal statements between these two lines are executed in a never-ending loop (*sounds like* Dynasty – ***Ed***).

Line 223 asks you to `Enter a note name` (such as 'Cbb3') at the keyboard, after which the procedure `read_note` is called in line 224 to do all the hard work. Once this procedure has read the note name and performed the conversion, the resulting key number (58) is returned to the caller in the variable `internal_note` supplied as the first parameter. If the reading and conversion process can't be successfully completed, the procedure sets the boolean value *true* into the boolean variable `error` supplied as the second parameter.

Now, most BASICs can't actually handle the return of values *via* parameters. If that's the case with your own system, you might have to return values using global variables which the procedure code and the caller's code can agree to access.

The `if` statement commencing in line 227 tells you if there was an `error` in line 229, but if no error occurred, the code following `else` (line 232) is executed.

The key number is displayed by the `writeln` statement in line 234, after which the second of the procedures under scrutiny, `write_note`, is called in lines 236, 237 and 238. Its job? To convert the key number stored in `internal_note` back to a note name and then display it. Three calls are made to show the effect of different second parameter values ('#', 'b' and ' ') on the call – more on this in a moment.

Procedure 'Read_Note'

The definition of this procedure starts at line 30 and finishes at line 159. Line 30 defines the name of the procedure and the details of the parameters that can be passed into and out of the procedure when it's called. Suffice it to say that the `var` in front of both `key_number` and `error` means that you can pass values in or out.

Lines 33 to 56 form a comment that describes what the procedure actually does. The symbols '{' and '}' bracket the comment, and the compiler simply ignores any enclosed text that exists purely for the benefit of human readers. The *format* definition in line 38 will probably become a little more readable if I explain that the '[' and ']' characters bracket *optional* items. So, we must have at least a letter and a single digit for the octave number (eg. 'C0') because the 'l' and 'n' aren't bracketed and are therefore not optional. The '|' character separates alternatives, so you can opt to have a '#', an 'x', a 'b' or a 'bb'. Note that the second 'b' in a 'bb' *must* follow a 'b' (*oh yes, obviously* – ***Ed***). It cannot follow a '#', which forms a different alternative choice. You should be able to work out that '[+|-]' means that you can have either a '+' or a '-' before the octave digit 'n'. This sort of shorthand definition becomes useful with experience, but that doesn't mean to say you shouldn't apply a bit of commonsense as well: without further complicating the format, it unfortunately allows 'C-8', which MIDI does not!

The procedure's local `var`iables are defined in lines 58 to 64. Note that `octave_number` can only hold legal octave numbers, so even if you program something silly in the way of calculations, you'll soon know if you've inputted an octave value of, say, -325. The range of values allowed for the contents of the variable `check_key_number` requires a little more explanation – this will come later when we see it in use.

Now, at last, we've reached the code of the

```
103 1 -      if ch = 'x' then {double sharp}
104 1 -        key_number := key_number + 2   {i.e. 'x' is +2 semitones}
105 1 -      else
106 1 -        if ch = '#' then {single sharp}
107 1 -          key_number := key_number + 1 {i.e. '#' is +1 semitone}
108 1 -        else
109 1 -          if ch = 'b' then {flat or double flat}
110 1 -            begin
111 1 -            read_iws( ch ) ; {pick up the next char to check for it being}
112 1 -                             {the second 'b' of a double flat}
113 1 -            if ch = 'b' then {double flat}
114 1 -              key_number := key_number - 2   {i.e. 'bb' is -2 semitones}
115 1 -            else
116 1 -              begin
117 1 -              key_number := key_number - 1 ; {i.e. 'b'  is -1 semitone}
118 1 -              read_next := false {ch is not the second 'b' of a 'bb' so it}
119 1 -                                 {should be needed as the first part of the}
120 1 -                                 {octave number - don't read another ch now}
121 1 -              end
122 1 -            end
123 1 -
124 1 -          else {we haven't 'used up' ch - so don't read now}
125 1 -            read_next := false ;
126 1 -
127 1 -    if read_next then {we have 'used up' the character in ch so get another}
128 1 -      read_iws( ch ) ;
129 1 -
130 1 -    {At this point we have read in the note letter and any sharps, flats
131 1 C     or natural signs that affect it. We have also read in the first
132 1 C     character after any of the latter which should be the first character
133 1 C     of those forming the octave number.}
134 1 -
135 1 -    octave_negative := ch = '-' ; {i.e. sign of octave number is negative}
136 1 -
137 1 -    if octave_negative or ( ch = '+' ) then {have 'used up' ch, so ...}
138 1 -      read_iws( ch ) ;
139 1 -
140 1 -    {we have the sign - only the digit remains}
141 1 -
142 1 -    error := (     octave_negative and not ( ch in [ {-}'2', {-}'1' ] ) ) or
143 1 -             ( not octave_negative and not ( ch in [ '0' .. '8' ] ) ) ;
144 1 -
145 1 -    if not error then {we have a full legal looking note name}
146 1 -      begin
147 1 -      octave_number := ord( ch ) - ord( '0' ) ; {convert character => value}
148 1 -      if octave_negative then
149 1 -        octave_number := -octave_number ;
150 1 -
151 1 -      check_key_number := key_number + octave_number * 12 ;
152 1 -      error := ( check_key_number < 0 ) or ( check_key_number > 127 ) ;
153 1 -      if not error then
154 1 -        key_number := check_key_number
155 1 -      end
156 1 -
157 1 -    end {of 'only do more work if ...'}
158 1 -
159 1 - end ; {read_note}
160 0 -
161 0 - procedure write_note( MIDI_key_number : MIDI_key_number_T ;
162 1 -                       sharp_or_flat   : char                 ) ;
163 1 -
164 1 - {This procedure, given a MIDI key number (passed in via the parameter
165 1 C  key_number), will print it out on the standard output file (usually the
166 1 C  micro's screen). If the note to be printed is a black note then the
167 1 C  parameter sharp_or_flat is checked for a '#' or 'b' to specify which note
168 1 C  name should be used e.g. MIDI key number 25 would be printed as C#0 or
169 1 C  Db0 when sharp_or_flat contained a '#' or 'b' respectively. If a space
170 1 C  is used to specify that the caller has no preference then a '#' will be
171 1 C  output when required. This idea could be extended to cope with key
172 1 C  signatures, 'x's, 'bb's and '='s.}
173 1 -
174 1 - var
175 1 -
176 1 -   black_note    : boolean ;
177 1 -   key_number    : 0 .. 11 ; {'C' through to 'B'}
178 1 -   octave_number : -2 .. 8 ;
179 1 -
180 1 - begin {write_note}
181 1 -
182 1 - key_number    := MIDI_key_number mod 12 ;
183 1 - octave_number := MIDI_key_number div 12 {giving range 0 .. 10}
184 1 -                 - 2 {forcing into range -2 .. 8} ;
185 1 -
186 1 - if sharp_or_flat = space then {substitute '#' - the default}
187 1 -   sharp_or_flat := '#' ;
188 1 -
189 1 - {Check for a black note - convert to a sharpened or flattened white note.}
190 1 -
191 1 - black_note := key_number in [ {C#}1, {D#}3, {F#}6, {G#}8, {A#}10 ] ;
192 1 -                                {Db}   {Eb}   {Gb}   {Ab}   {Bb}
193 1 - if black_note then
194 1 -   if sharp_or_flat = 'b' then
195 1 -     key_number := key_number + 1 {i.e. print white note above, flattened}
196 1 -   else
197 1 -     {sharp_or_flat must be '#' - so print as note below, sharpened}
198 1 -     key_number := key_number - 1 ;
199 1 -
200 1 - {Print each component of the 'note name'.}
201 1 -
202 1 - case key_number of
203 1 -     0 : write( 'C' ) ;
204 1 -     2 : write( 'D' ) ;
205 1 -     4 : write( 'E' ) ;
206 1 -     5 : write( 'F' ) ;
```

```
  207 1 -     7 : write( 'G' ) ;
  208 1 -     9 : write( 'A' ) ;
  209 1 -    11 : write( 'B' )
  210 1 - end ;
  211 1 -
  212 1 - if black_note then
  213 1 -   write( sharp_or_flat ) ;
  214 1 -
  215 1 - write( octave_number : 1 )
  216 1 -
  217 1 - end ; {write_note}
  218 0 -
  219 0 - begin {MAIN}
  220 0 -
  221 0 - repeat
  222 0 -
  223 0 -   write( 'Enter note name: ' ) ;
  224 0 -   read_note( internal_note, error ) ;
  225 0 -   writeln ;
  226 0 -
  227 0 -   if error then
  228 0 -     begin
  229 0 -     writeln( 'ERROR: note name illegal.' ) ;
  230 0 -     writeln
  231 0 -     end
  232 0 -   else
  233 0 -     begin
  234 0 -     writeln( 'Key number: ', internal_note : 1 ) ;
  235 0 -     writeln ;
  236 0 -     write_note( internal_note, '#' ) ; writeln ;
  237 0 -     write_note( internal_note, 'b' ) ; writeln ;
  238 0 -     write_note( internal_note, ' ' ) ; writeln
  239 0 -     end ;
  240 0 -
  241 0 -   writeln( '-----------------------------' )
  242 0 -
  243 0 - until false
  244 0 -
  245 0 - end. {MAIN}
0 Compilation error(s)
Code size = 1265 bytes
%
```

procedure itself. In line 68, we effectively take the view that whoever's typing in the note name is innocent until proven guilty, ie. that he or she is typing in a legal note name until we discover otherwise. In line 72, we read in the first character of the note name using the procedure `read_iws` to ensure that we ignore leading spaces and new lines. The `if` statement (comprising lines 74 to 88) tests that the character read in is a legal note letter by checking whether it's `in` the set of upper and lower case letters 'A' through 'G'. This range is defined by the Pascal syntax `['A'..'G', 'a'..'g']`. If the test fails, this can't be a legal note name and the `else` part of the `if` statement is executed (line 88); this sets the variable `error` to *true*. German readers who use 'H' as a legal note letter would no doubt want to modify the set definition...

Assuming the letter is OK, the `case` statement (lines 76 to 84) assigns a key number offset corresponding to the letter's position in relation to the white notes starting from 'C'. If our character is an upper or lower case 'D', for example, only line 78 of those within the `case` statement is executed, and the variable `key_number` is assigned the value 2. Thus, the white note D is two semitones, and therefore two key numbers, above C. In line 85, a further offset of 24 is added so that our note is assumed to be in the octave commencing with 'C0', key numbers 24 ('C0') to 35 ('B0') 11 semitones higher. The octave number tells us how many octaves (or 12 key numbers) to add or subtract. For instance, if the full note name turned out to be 'D3', the key number would start off as an offset of 2 (within the octave), change to 26 thanks to line 85 while we assume it is 'D0', and then have 2 (its actual octave number) multiplied by 12 added, to give its actual key number of 50.

If we've already had an error somewhere along the line, we avoid executing the rest of the code thanks to the `if` statement commencing in line 90. If a good letter name has been dealt with, the next non-space, non-new-line character is obtained courtesy of procedure `read_iws`. The idea in code lines 98 to 128 is to deal with the character just read if it is a '#', an 'x', a 'b', or the first character of a 'bb'. Since it may actually be none of these things but part of the octave number instead, we may not actually use the character, in which case we must remember to use this rather than reading in another character. The variable `read_next` is used to record whether or not (*true* or *false*) we're forced to perform the next read.

If you apply some concentration to the careful reading of the nested `if` statements in lines 98 to 121, you'll see that the various possibilities for sharps, flats and naturals are checked for and appropriate modifications made to the `key_number` variables contents.

For example, if the note name has one sharp applied to it, the key number is incremented by 1. If we had 'Dbb3' rather than 'D3', the key number would be decremented by 2 to become 48. The comment in lines 130 to 133 sums up our situation at this point – we have only the octave number to deal with.

If the character we have is a sign for the octave number, we remember if it was negative in the variable `octave_negative` in line 135, and read in the octave digit in line 138. If there is no sign, the character we have *is* the octave digit value, held as an ASCII character code.

Lines 142 and 143 check that the octave number will, when eventually calculated as a numeric value, be in the range -2 to +8. Line 147 performs the conversion from the ASCII character code version of the digit to a numeric value stored in the variable `octave_number`, and lines 148 and 149 are responsible for negating this value if we'd remembered a '-' sign. We can now complete our calculation by shifting the key number up or down into the correct octave (line 151).

As for the key number, this is temporarily stored in the variable `check_key_number` in case it lies outside the MIDI key number range of 0 to 127. Yet although we've already checked we have a legal note letter and octave number there's still the possibility of error. Consider the note name 'Cbb-2', for example. 'C' is a legal letter and -2 is a legal octave number, but the 'bb', whilst seeming to be a legal modifier, actually reduces the key number from 0 (for 'C-2') to -2, which is illegal. Similarly, notes which would be above G8 (up to Bx8, in fact) look legal in terms of note letter and octave, but all give a key number greater than 127. Anyway, the range of values the `check_key_number` variable can hold (defined in its declaration in line 64) should now make more sense.

Finally, if there's been no error of any kind, the checked key number is returned to the caller thanks to the `key_number` parameter (line 154), and the procedure call ends.

Procedure 'Write_Note'

This procedure's parameters are defined in lines 161 and 162. You can see that both parameters allow data to be passed in but not out (since `var` was not specified). In fact, the use of these parameters is explained in the comment that begins in line 164: the local `var`iables have been declared in lines 174 to 178.

As soon as it's called, the procedure starts off by calculating the key number's position within the octave in line 182, and its octave number in lines 183 and 184. If the caller has shown no preference for printing the names of black notes as '#'s or 'b's by the time things get to lines 186 and 187, the default of '#' replaces the space character that the caller specified (see line 238). Line 191 checks if the key number within the octave we have is one of the black notes (ie. `in` the set [1, 3, 6, 8, 10]). If it is a black note, the nested `if` statement (lines 194 to 198) changes the key number to be the white note above or below, depending on whether we wish to print the black note's name as the white note above flattened or the one below sharpened. This is where the logic of high technology stands to one side and personal taste comes to the fore.

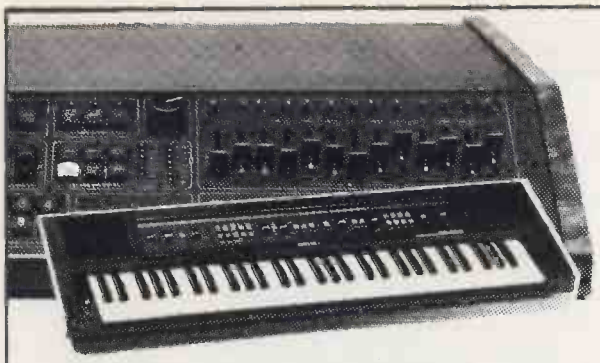
We now know everything about the note name, so we can print out each portion in turn. The correct note letter is printed out by selecting the relevant arm of the case statement (lines 202 to 210) and is followed by a '#' or 'b' as required (lines 212 to 213). Finally, the octave number is written out in line 215; the `: 1` indicates the field width that the value should be printed in, and in this case, is an instruction to print with no leading spaces, so that there's no separation between the octave number and the rest of the note name.

What Next?

If you've managed to digest the content of this month's instalment without going completely insane (congratulations!), you will at worst have a couple of routines to slot into your catalogue of useful software bits and pieces. At best, you should be itching to put them to some incredibly exciting and wonderful purpose. You may have some of your own already-written software that you can now make a little more user-friendly by taking advantage of the two procedures.

In fact, examples of the sort of software that might benefit from the use of such routines come to mind fairly easily: a sequencer package's step-time editing section, for instance, or a music theory 'intervals test' program for the less musically-literate.

You might even consider these routines as the first step down the road towards our own Music Composition Language. Well, there's no harm in being ambitious, after all. ■



SELL IT FOR NOTHING

With a Free Classified Ad in Electronics & Music Maker

Now sales and wants ads from private individuals can be placed free of charge in E&MM's classified section. Which means if you've got some gear you need to sell, or a particular item you want to track down, all you need is fill in the coupon below, send it to us on or before the specified date, and your ad will appear in the following issue. Simplicity itself. So for the price of a postage stamp, you'll reach a bigger audience of electronic music players than any competing publication. If you'd like your ad to appear for a second month, simply send in the order form again – and we'll oblige. (Please, no phone calls or cryptic messages!) Note though that this service is available only to private individuals: companies must use the standard classified order form.

WERSI HELIOS transportable organ, full synthesizor, 64 presets, 64 rhythms, digital reverb, Wersi harp, custom cabinet, £2650 ono. Plymouth (0752) 42786.

TAPE DECK – Philips N7150 quarter track, home use only, £170 ono. Soundmaster SR-88 drum machine, £40 ono. Telephone Sheffield 557063.

WANTED old synth, working or not, I will pay £10 to £40. P. W. Rizzo, 9 Harton Road, Edmonton, London N9 0SG.

ROLAND GUITAR SYNTH GR300, as new £200 0268 691180.

ROLAND MPU401 with IBM interface and software, as new £175. 0268 691180

FOR SALE Roland Juno 6 **£345,** with flight case £395. Also Hohner accordion 120 bass, £195. Tel. 0234 328642.

NATIONAL SX-3500R console electronic organ, two manual with pedals and auto rhythm, very good condition, £350. Phone Shottisham (0394) 411518 (Suffolk).

BIT ONE only five months old, home use, hardcase, bargain at £650. Tel. 079 14 6527 (E. Sussex) ask for Patrick.

POWERTRAN T2000 synth £95, programmable drum machine £55, 51X channel stereo mixer, £50. Freedomphone £30. Wanted Stereo reverb (09323) 46232.

WANTED: Drawmer noise gate, E&MM drum soft, Simmons drum pads, MIDI sequencer or software. Telephone Nottingham (0602) 414892.

BOSS KM60 6 channel mixer, effects send, stereo return. Very good condition, £150. Telephone: 01-506 0366.

YAMAHA CS60 £670 ono. CS10 £145 ono. Roland TR77 rhythm machine £100. Mike Wickford (03744) 4416.

KORG MS-10 mono synth with built-in patch bay for wierd sounds, v.g.c., £130 ono. Phone David 0206 43547 evenings, Colchester.

CASIO CT403 electronic keyboard, auto play and rhythm, built in as new, £180. Tel. 0206 44834, evenings.

EINSTEIN COMPUTER, twin disc drives, software books etc. Colour monitor with extended warranty as new, £650 ono. Shrewsbury 67133 (work).

ROLAND SH2000 mono preset synth, custom case, excellent, £200 ono. HHIC100 instrument amplifier, mint £95. Lincoln (0522) 752458.

YAMAHA MK100 Portasound, new, boxed guaranteed, £190 ono. Can deliver. 0889 591115.

CASIOTONE 1000P, mint condition with case, micro link circuitry allows sequencer synchronisation with TR606 Drumatix, £120. Phone Gloucester (0452) 22559.

WANTED – ARP Quadra. For sale, Drumatix, bassline, JX3P, the Clap – offers all excellent condition. Phone Rok, Huddersfield (0484) 46062.

HAMMOND L122 tonewheel organ, two manuals and pedals, home use only, very good condition, £350. West Yorkshire (0977) 82408.

WANTED Jean Michel J video of China Concerts, Phone Portsmouth 739144 evenings, will pay well.

ROLAND TR606 plus power supply and carrier, mint condition, £110. Phone Marc 092 5762147 (Ches).

PATCHBAYS, high quality GPO type, 20-way, normalized £12 each, non-norm £8 each. For details phone 0242 571469 ask for Tim.

YAMAHA DX9 synth as new **£595** ono. Digisound modular synth 16 modules cased £250 ono. Tel. 0977 518267 day 0532 892253 evenings.

YAMAHA SK20 organ/strings synth, split keyboard operation, home use only, v.g.c., £325. Phone Plymouth 700814.

ASTERAL PLAIN'S C46 cassette of emotive electronic music £3.50 P&P inclusive. Gencychist, c/o 46 Bracken Bank Avenue, Keighley, W. Yorks BD22 7AD.

YAMAHA DX9 £625 ono, boxed tapes, manuals, bought December, v.g.c., SH101, MGS1 PSU, Synsonics, drumsticks. £165. Phone Jeremy (023 57) 65056.

ZX SPECTRUM 48K, on its own, any offers what so ever, Fareham 281137.

KIMBER ALLEN two and a half octave keyboard and contacts. Perfect condition, unused. Ring 052 95 373 evenings. £25 ono.

CASIOTONE 501 £200. Wanted Casiotone 1000P, Mattel drum machine £40. Telephone 0562 850407.

ROLAND SH101 and power supply only £150. Roland TR606 Drumatix £105. 01-359 6776.

ROLAND JX3P home use only £550. Accessit compressor £35, Sinclair 48K Spectrum + 9 games, £65. Telephone Paul, Glossop 2156.

SELMER 4×12" cab 120w, great sound, good condition, £70 ono. or swap for Marshall lead guitar cab. Phone Neil (0273) 411460.

HIWATT CUSTOM 100 watt amplifier £75. Vox Flanger £25. Electro Harmonix, small stone phaser £20. Oxted (08833) 2979 evenings.

WANTED Roland Cube 60 or similar. Simon Dodsworth, 31 Ripstone Gardens, Southampton SO2 3RF

£800 OF COMPUTER HARDWARE and software including 48K Spectrum, microdrive, speech and joysticks, swap for Sixtraks. Tel 01-809 2841 after 4.00 pm.

ROLAND JX-3P £525. Korg SQ-10 sequ, £120. Ibanez HD1000 harmonic/delay £200. Write T. Winder 2 Alban Road, Liverpool L16 1JJ.

HAMMOND ORGAN portable tonewheel with pedalboard and Sharma 5000 £495 ono. Waltham Cross 38419.

SWAP tape of your music for tape of mine. Steve Hartwell, 37 Pontout Road, Southampton SD1 7DL.

SOUND SYSTEM ZX Spectrum 48, interface 1, microdrive, cartridges, Alphacom 32, printer, Kempston interface, joystick, books, tapes, sound sampler, synthesizer, all mint, £350. 0970 8170.

WANTED Yamaha **DX9,** in good condition, can you deliver to Newbury, Berks? Ring Mark Tel. 0635 33574 evenings.

CLEF 5 octave digital programmable synthesizer, for use with BBC micro, unused in original packaging, £275. Telephone evenings 0782 314053.

WANTED Just can't get enough and New Life sheet music by Depeche Mode. Phone Gary Westhoughton (0942) 816531.

YAMAHA CP30 electric piano, touch sensitive, weighted keys, self contained flight case and legs. £280. Phone 021 354 7765.

THE KIT £50. Will swap PRO DNE for any small 1V10CT synth or module. Akai recorders £90. Paul (077478) 3811.

ROLAND SH5 synth and CSQ100 sequencer £235 ono. Woking 61765.

KORG POLY 61 absolutely mint condition, boxed, home use only, £499. Phone Chester (0244) 674802 after 4pm.

ROLAND TR606 Drumatix, as new, £115. Phone 04023 42997 evenings.

YAMAHA YC45D combo organ, £625. Yamaha RA100 rotary speaker £375. Wanted Yamaha electric CP30 piano or simlar. Birmingham 021-352 0240.

KORG POLYSIX good condition, 32 memories, arpeggiator, chorus, phase ensemble. Great Synth £475. Contact Roy 01-882 0517 £475.

CASIO CT202 keyboard, 49 sounds with stand £135. Roland TB303 bassline £120. Tel. Slough 76406 after 5.30pm.

MOOG PRODIGY very good mono synth, excellent condition, £125 ono. Steve Tel. 01-445 4240.

YAMAHA CX5M, full size keyboard, two cartridges, £550. Korg MS20 and DR110 rythm £200. All perfect condition. Tel. 0782 502586.

SWAP ROLAND JX3P for Yamaha DX7 and or PRO1 for Oscar. Home use only. Both in excellent condition. Phone 0533 531919.

DRUMULATOR £550. Swap for Roland TR707 or similar. Hard, aggressive musicians with gumption needed also! tony or Al 01-452 1916 evenings.

NEW X50 Elka Hammond sound drawbars, presets, completely portable £325. Ideal keyboard base, 33 Kimbolton Green, Borehamwood, Herts.

POWERTRAN VOCODER £200, Powertran MPA200, 100w amplifier with 2×12" 200w cabinet £100, Clef string ensemble £200. Phone York (0904) 24724.

ROLAND TR606 £125, TB303 £125, boxed, mint, superb Maplin 5600's synthesizer, alphadac with case keyboard and power supplies. 0487 813961.

JUNO 60 Boss DR110, home use only, good working pair manuals, leads, £600 ono. Tel. Blackpool (0253) 31990. Quick Sale.

EMS Synthi, AKS or VCS3 wanted. Phone St Austell (0726) 883265.

MOOG PRODIGY synth, two oscillators, fat sound, good condition, £120 ono. Phone 0206 867863 (Colchester).

KORG POLYSIX excellent condition, home use only, £390. 0703 738980.

CLEF MASTER rhythm, programmable drum machine, plus instruction manual £60, Casio MT40 plus power supply, £70. Phone Simon 0203 683834.

THE MIDI MICRO! Commodore 64, disk drive, cassette, £400. Casio CT405 £180. Powertran MPA200 amp £50. All ono. Tel. 0532 675240.

POWERTRAN MCS.1 excellent condition £700. Yamaha RX15, home use only, £350. Telephone Andy Worcester (0905) 426582 after 6.30pm.

FIRSTMAN SQ-01 sequencer 1024 note memory, built in synth, will control other synths £60 ono. Tel. Romsley 710680 (Rob).

OCTAVE Kitten 2 synth, good condition, £120 ono. Phone (0257) 452303.

YAMAHA SK20 ensemble keyboard, poly-synth, strings, organ, beautiful sounds, with carrying case. Studio use £350 ono. Tel. Steve (0782) 262286.

YAMAHA PS2 £50. Casio PT30 and mains adaptor £50. both vgc. Phone Grimsby (0472) 48098 after 4pm.

BAY OF SOLITUDE C50 chrome cassette of emotive electronic music £2.50 from Mike Brooks, 21 Riddy Lane, Luton Beds. LU3 2AD.

DX9 £600. Revox A77 £200. ETI vocoder £150. 6:2 mixer £50. All home use only. Alan 0536 725885.

CASIO CT301 14 presets, 8 rhythms, excellent condition, £140. Phone 05827, 60553 (Herts).

FOR SALE Roland CSQ600 digital sequencer, perfect condition, boxed with manual £85. Also Akai 4000DS R-R £50. Tel. 01-265 1899.

ROLAND JUNO 6 for sale £340. (Including hard case). v.g.c., Phone Sedgley (09073) 4588 evenings. Ask for Neb.

H/H STUDIO FIFTY guitary amplifier, reverb, hardly used, excellent condition, complete with effects pedal and cover. £75. Ring Orpington 70396.

TEAC 144 Portastudio little used, immaculate condition £450. Telephone Lowestoft 741238.

HOME STUDIO GEAR DX9, Poly 800, RX15, MT44 system, Pro-One DE200 etc. All immac. boxed. Phone Newcastle 4102105, Paul.

MIDI INTERFACE Roland MPU 401 with software & IBM card, £175. Tel. 0268 691180.

EAVESTAFF 'Minipiano' 7 octave upright piano + stool, v.g.c., £320. Tel. 0223 69344.

PRO ONE Monosynth, never used outside home, £310 ono. Excellent condition. Telephone John on Barnoldswick (0282) 815074.

COMMODORE VIC-20 colour computer with cassette unit, programming books, lots of software, good condition, £90. Phone Diederick on 01-727 4510 evenings.

STUDIOMASTER 14 mixer with parametric EQ and two effects loops, £900. Phone Steve evenings 0256 882357.

COMPLETE synth system, Roland RS09, SH09, MC202, TR606, Yamaha CS5, 100w PA, triple stand. Offers? Jason (0706) 217260.

CRUMAR TRILOGY Layered polysynth, strings, organ, home use only, immaculate condition, including stand. £699 new, bargain £299 ono. Telephone Keith (0442) 68375.

ROLAND TB303 baseline, s new, boxed, £95. 01-868 0331.

E&MM FREE CLASSIFIED ORDER FORM

Fill in the form below to a maximum of 20 words (one in each box), and send it to: E&MM Free Ads, Alexander House, 1 Milton Road, Cambridge CB4 1UY. Please print clearly in BLOCK CAPITALS. The ad must reach us on or before **Friday, June 7,** for inclusion in the July issue of E&MM.

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	

H&H digital effects – ADT/echo, chorus/flanger, to fit MA mixer amps, cost £220, accept £150. Tel. Tyneside (091) 2623933.

ROLAND JUNO 106 5 months old, home use only, mint condition £599. Phone Dave 0722 26018. Salisbury, after 6pm.

CASIO PT-80 mint condition, 12 rhythms, 8 voices, memory play ROM, pack, £45. Tel. Chapel 814383.

ROLAND RS-505 Polysynth, strings, bass, excellent condition, never gigged, £250. No time wasters. Southampton 771833.

YAMAHA CS30 oval voice synth with built-in sequencer, home use only, £250 ono. Phone Edinburgh 443227 between 6pm–8pm.

TECHNICS SK250 for sale PCM digital drums and solo voices, new condition, home use only. £375. Phone 0472 78616 (Grimsby).

ROLAND GR700 guitar synth + PG200 programmer, half price!!! £1200. Club bandbox £200. Fender Rhodes £200. Phone Fareham 662533 after 6pm.

CASIO PT30 keyboard v.c.g., two years old, £40. Boss MA5 micro monitor v.g.c., £50. Phone Pete on Oswestry 653482 today!!

POWERTRAN FOUR voice polysynth fully working £250. 2×15" bass cab, 2×10" top cab £250 complete. Phone Caterham 49181 evenings.

TEAC 144 Portastudio immaculate condition, little used, £450. Telephone Lowestoft 741238.

PIANO WANTED £50 in good condition, we will collect around London. 01-274 0966.

FOR SALE, Poly 800 and SH-101 + MGS1 both in perfect condition. Both for £565. Chandlers Ford (04215) 68523.

FOR SALE, Drumtracks, £700. Sixtraks £500. Commodore 64+cass, £150. The Lot £1150. Phone Reading (0734) 343819 anytime ask for Glyn

BARGAIN 8-channel mixer EMM 842 with power supply £195 forboth 16" roto-tom with stand £25. Tel. Paul 0342 23094 (Sussex)

ACORN ELECTRON for sale, mint condition, (unswanted gift), not used since new. £99. Phone 0223 241906 (6–7pm).

PROPHET 600, home use only, mint, £850, Phone 0782 513072.

ROLAND JUNO 60, home use only, serious offers, after 5pm. Northampton 0604 27644.

CRUMAR ROADRACER tough sensitive piano assignable 2 octave bass, chorus, never gigged, v.g.c. Phone Graeme 01-960 3607 (evenings).

CSQ600 £100, 5-piece Pearl powertom kit, + stands, mint, offers? 01-254 3631 eves.

KORG KPR 77 drum machine real/step prog., dumping, stereo plus snare/handclap outputs, tom7lams, £155 ovno. 01-359 6723.

DIGISOUND MODULAR 80 synthesizer, £450. Roland TR808 rhythm machine, £350. Jen 2000 synthesizer, £80 all home use only. (0249) 75300.

CASIO VL-1 29 keys, 5 sounds plus ADSR, built in calculator, lus mains adaptor, good condition. Tel: 699 5354. £15.

YAMAHA PS6100 FM sounds, digital programmable drums, 4 track built In recorder, touch sensitive sounds £725. Southend (0702) 511339.

WURLITZER 4037 with orbit 3 synth, good condition, used only in home. Matching stool. After 5. Tel. Esher 67946.

PRO ONE, only eighteen months old, immculate condition, superb sounding lead and bass mono-synth £250. Phone Wantage (02357) 68873 evenings.

ROLAND TR606 drum machine £110. Casio MT65 £75. eac A3340 £75. Teac A3340 4-track slmul-sync £350. Marshall top MV50 watt £125. Tonbridge 366223.

ROLAND SH2 £170 ono orswap for good drum machine or delay echo unit. Sheffield (0909) 567151 day time prefered.

YAMAHA CS15D synth, presets, with variable section, plays two sounds at once, v.g.c., £150 ono. Will swap for Roland MC202 (0268) 411890.

SIEL OPERA-6 polyphonic programmable MIDI synth. Touch sensitive, omni-poly MIDI W/floatlng MIDI split. Mint condition, £475. Phone 01-883 1335 anytime.

BOSS DR110 drum machine boxed as new and Korg MS-10 mono £180 the pair. Phone Ross (06285) 20751 (near Maidenhead).

PORTABLE ORGAN Cavendish 30 combo 8 rhythms, 9 volces including piano. With stand, home use only. £195. Weston Super Mare 22315.

KORG SIGMA monosynth v.g.c., £199. Boss CE3 stereo chorus pedal £45. Tama Swingstar 5-piece drums HiHat (back) £260. Phone 01-398 3933.

FOUR TIER keyboard stand £50 mixer/amp in flightcase and matching speaker system £250. Phone Paul on Keevil 870406 evenings

YAMAHA DX9 for sale never gigged, six months old, immaculte condltion, plus over 300 volces £585. Phone Dominic Beeton 01-202 4624.

SYNTHESIST/PROGRAMMER seeks residency/partnership with studio/production company. Own electronic music/sound sampling sequencing composers facillty. Ring 01-555 0672 eves. Tom.

TANNOYS 15" HPD 385/8s crftsman built tannoy spec cabs 46"×26"×16" £450 ono. also Wurlitzer piano £250 ono. 09824 212. Could delivery (at cost).

EMR MIDI interface and software for BBC micro £75. Bath (0225) 319662.

MOOG SOURCE synthesizer like a uprogrammable minimoog sequencer, arpeglator, perfect, flightcase, pedal £250. Bob Hatfield 68601 evenings.

ELECTRO HARMONIX super replay sampler, plus SH101 and drum pad, £575. Yamaha RX15 digital drums, £390 ono. Phone 0602 626745 afternoons.

LOWERY ORGAN symphonic holiday TGS1 big heavy instrument with many superb features £750 ono. Telephone Ashtead (03722) 75293.

CLEF BANDBOX with programmable bass, excellent condition, any offers? Phone Stuart on Sheffield 664942.

ZX SPECTRUM 16K, boxed with lots software and cassette recorder £65 ono. Phone Façade on Wendover 623416 after 5.30pm.

YAMAHA YC45D organ (portable) twin manuals bass pedals stand + case, v.g.c., £400. Phone Maidstone 685866 (evenings).

BOSS DR110 rhythm swop keyboard Casio/Roland/Yamaha or accordion. 0856 74206 after 6pm.

CASIO CT201 preset polyphonic full size keys £140. Octave kitten mono synth £100 or both £220. St Albans (0727) 57251.

YAMAHA CS15 powerful synth + Firstman sequencer synthesizer both £300 or sold separately. Call Eddie on Chandlers Ford (04215) 2347 at any time.

LAWRENCE AUDIO piano stringed mini piano with magentic pick-ups, bashed but mostly working £50. Tel. Bristol 513046.

YAMAHA CS01 synthesiser monophonic breath controlled mains adaptor included, headphone socket hardly used, £100 ono. Tel. Mike Halifax 844333.

YAMAHA CS15 2VCO's 2VCF's 2 EG's external Input for gultar/vocals etc. good sound, v.g.c., £210 ono. Phone 097084 411.

WANTED PEOPLE to collaborate on various experimental projects any style. Matthew McCormick house 5, 2 St Peters Path, Woodside, Glasgow, G4 9YH.

KORG MS10 T reg one owner complete with manual and extra patch leads, nice little runner. Bargain £95. Tel. 0443 407713 (Pontypridd).

BBC MICRO ATPC ROM/RAM expansion board, new, and the best £30. Phone Bath (0225) 319662.

KORG MONO/ploy 4VCO and arpeggiator 4 months old, little used £290. Hammond Cadette organ £150. Southampton 583696.

ROLAND MC202 microcomposer power supply £115 ono. Music-Man 212HD combo electro-voice speakers. Stunning sound. £245 ono. Ring 01-981 7827.

ROLAND TR808 rhythm composer, mint, £295. Phone Southend (0702 614719.

FOSTEX 350 mixer 8:4:2, mint £295. Phone Southend (0702) 614719.

BOSS DR110, graphic rhythm machine, v.g.c., £80. Phone Huddersfield (0484) 514346.

YAMAHA MK100 six months old, as new, boxed £250 ono. Slmon Dodsworth, 31 Ripstone Gardens, Highfield, Southampton SO2 3RF.

JUNO 6 £375 ono, Fostex X15 Multitracker £220 ono, boxed. DR55 £30, 3 10" tapes £25. Tel.01-421 1513.

WANTED Dynacord DPR16, eight presets £550. Sixteen presets £590. Cashpaid, will collect. Burnham (06286) 4576 (Berkshire) selling SH101 £130.

SH SEQUENCER Roland MC202 £170 still boxed. TR606 Drumatix £150. Eros electric guitar £50. Upright piano Mornington & Wuston £100. Tel. Dinnington 566695.

MUSIC 500 **BBC** synthesiser, absolutely mint, bargain £160 ono. Crediton (03632) 4627.

KORG MS-50 wanted, around £170 paid for this expansion unit. Please phone (0222) 567850.

CASIO 22 voice portable keyboard rhythms, automatic bass, fill in £75. Daventry (0327) 704230 evenings (Northants).

ROLAND HP-70 electronic piano, perfect condition, only six months old, still under manufacturers guarantee. Stand, bargain £420. Jane, Hatfield 67644.

YAMAHA CX5M with large YK10 keyboard Commodore monitor and software all boxed and as brand new. Blackburn (0254) 47199.

Index to Advertisers

CLASSIFIED

Rates for 1985: Lineage 35p per word (min 12 words); Box No. 80p extra. Semi-Display: £1.00 extra. Display: £12.00 per single cm. column

All lineage advertisements must be pre-paid. Closing date: 6 weeks preceding cover date.

Advertisements are accepted subject to the terms and conditions printed on the advertisement rate card (available on request).

FOR SALE

FOR PROMOTIONS VIDEOS COME TO JON-JON VIDEO PRODUCTIONS we are friendly, reliable, creative and we enjoy our work. Each project budgeted to clients requirements. U-matic or VHS productions at highly competitive prices. Don't hesitate to ring us now for more information. 061-486 1260.

POWERTRAN 1.6 SEC DDL's Turned into Samplers. 2 Oct.1V/OCt Synth Pitch Control, Extensive Trig/Retrig system with output VCA. Synth independent pitch control facility. Send SAE for details. £95 charged for conversions. Manual for £35 DIY £12. Free assembly of DDL Kits for conversion. Foxland Electronics, 39 Bates Street, Sheffield S10 1NP.

THE CITY UNIVERSITY

DIPLOMA IN MUSIC INFORMATION TECHNOLOGY

The Music Department at the City University, London will be the first to launch a Diploma in Music Information Technology.

The Diploma covers all aspects, both practical and theoretical, of the application of computers and micro-processors to music; for example the principles behind compact disc players and digital recording and the new electronic synthesisers and computer (MIDI) interfaces. Students will be taught programming skills and be given courses in essential background subjects such as acoustics, psycho-acoustics and artificial intelligence.

The course is available in 1 year full-time and 2 year part-time forms and is designed to fulfill the needs of recent graduates wishing to join the music industry, of composers and engineers, of members of the teaching profession seeking retraining and of those who already work in music and who need to keep up with these recent developments.

For further information contact: The Administrator, The Music Department, The City University, Northampton Square, London EC1V 0HB. Tel. 01-253 4399 x 3265.

GATEWAY STUDIO

The Gateway School of Recording and Music Technology

Consultants in Studio Synthesiser and Computer Music applications

RECORDING & SYNTHESISER COURSES

Call us at Gateway for details of our Primary and Advanced recording courses, Synthesiser courses and Specialist courses in Computer/Synthesiser interfacing. We are at present planning short orientation courses for the Synclavier and other advanced keyboards, and we would like to hear from you about courses you would like to be involved in.

Write to Gateway School of Recording and Music Technology, 1a Salcott Road, London SW11 5QD or call 01-350 0340.

Our courses are arranged in co-operation with Bandive, The Fostex Corporation, Soundcraft, Teac and Roland UK.

These courses should not be confused with any others

HI-TECH MUSIC CENTRES

YES, we've got the latest gear you want from **YAMAHA, ROLAND, SCI, KORG etc. like DX-7's, PF-15's, JUNO 106, Six-trac, Drumtraks,** Poly-800 all on demonstration and available at the right prices! Plus **INTERFACES for BBC B and CBM 64** Computers, all MIDIed up and ready for you to try. Call 01-863 1841 for Catalogues, Prices, and Advice.

City Music

Phone 01-863 1841 for an invitation to our next Midi Synth Show

NORTH HARROW: Pinner Rd. 01-863 1841
TORQUAY: 65 Market St. 0803 25488
EXETER: Queen St. 0392 51846
PLYMOUTH: Drake Circus 0752 23011
TRURO: 16 Pydar St. 0872 71359
JERSEY: 8 Esplanade 0534 78901

MUSIC LAB SERVICE

Officially appointed

REVOX TEAC/TASCAM

Service Agents

A fast, efficient repair service with collection and delivery available

Contact Nikki Antoniou on

01-388 5392

72 Eversholt Street, London NW1 1BY

CLEF ELECTRONIC MUSIC

The NEW CLEF DIGITAL C.M.S.

WHEN WE SAY 'PROGRAMMABLE' WE MEAN IT!

The new Clef Computer Music System is a FULLY programmable Digital Synthesizer. It's so programmable that you need a BBC Microcomputer to run it.

Programmable waveforms on 32 independent oscillators. Programmable shape and keyboard touch response on 32 envelopes. Programmable stereo on each Osc/Env. Up to four different Osc/Env's per note. 5 Octave touch sensitive keyboard, real time polyphonic sequencing and massive potential for future software. In short, the Musical control you've always wanted at an affordable price.

BAND-BOX

Programmable backing trio

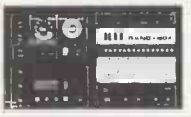
THREE PIECE BACKING BAND

Generates the sounds of three Instrumentalists to back Soloists & Cabaret Acts

DRUMS+BASS+KEYBOADS

Over 3,000 chord changes (60 scores) on 132 different chords – 16 chord sounds

RRP £499.00



Phone or write for full details **EXPERIMENTERS! PDSG, P.S.U.** & Keyboard available separately as promised in E&MM. Demonstrations by appointment at:

CLEF PRODUCTS (ELECTRONICS) LIMITED
(Dept E&MM/3/85) 44a Bramhall Lane South, Bramhall, Stockport, Cheshire SK7 1AH. 061-439 3297

Loudspeaker Cabinet Fittings

From Adam Hall Supplies:
Coverings & frets • flight case parts • Celestion power speakers • Rean jacks & fittings • P&N stands

Send 30p PO/cheque for Illustrated catalogue

ADAM HALL SUPPLIES LTD
Unit M,
Carlton Court,
Grainger Road,
Southend-on-Sea
Essex

Celestion Cabinet Handbook Available NOW Extra £1

Opportunity Nox

for enthusiastic yet practical

HI-TEC EXPERT

Fully versed in computer technology and musical electronics, to help develop and expand this side of our business. Salary negotiable according to experience – and the potential is enormous!

If you think this post is just up your street, apply for an early interview to:

Mr Kim Joseph
ABC Music Company
85 High Street
Esher, Surrey KT10 9QA
Tel: Esher 66195

MAKING TRAKS

HIRE — PROGRAMMING

Helps you get your ideas onto tape

PHONE
to rent a MIDI synth, drum machine or portastudio. Special package prices and free London deliveries.

PHONE
for free, impartial advice on setting up or upgrading your studio

PHONE
for help with production and arrangements or if your demos don't sound the way you want

01-727 7758

PRACTICAL COURSES IN PROFESSIONAL SOUND PRODUCTION TECHNIQUES

inc. Multi-track Sound Production and Computer-assisted Mixing Consoles, Digital Sound, Analogue/Digital Sound Synthesisers & Drum Computers etc. Sound Post-production of TV/Video Programmes, Pop-music Video Production, Production Jingles, Commercials, Film Music and Song Arrangements.

Instruction by professionals working in the industry and practical experience on state-of-the-art equipment throughout the course.

Three-month and short-term courses in modern studio.

For further information contact:

Media Production Services

238–246 King Street, London W.6 Tel. 01-274 4000 Ex. 409

Off the record

DOWN IN THE STUDIO WITH NICK RHODES AND THE NEW KORG DW6000

THEY'VE SOLD MILLIONS OF RECORDS IN HUNDREDS OF COUNTRIES. THEY'VE SOLD OUT ON WORLD TOUR AFTER WORLD TOUR. THEY'RE PIN-UPS, PROVERBIAL SUPER STARS.

SO WHAT KEEPS DURAN DURAN ON TOP OF THE GAME, HUNGRY FOR EVEN GREATER SUCCESS?

NICK RHODES GAVE US A FEW CLUES WHEN WE MET FOR A BRIEF WORD RECENTLY. "SUCCESS DEPENDS ON HARD WORK", HE TOLD US. "IT DEPENDS ON ENERGY, DRIVE AND ORIGINALITY.

I THINK THE MINUTE WE START PRODUCING THE SAME SOUND, WE'D SPLIT UP. ORIGINALITY'S VERY IMPORTANT TO US. AFTER ALL, WE SPEND 99% OF OUR TIME WRITING, RECORDING, PERFORMING AND MAKING VIDEOS.

WE HAVE TO BE SATISFIED WITH WHAT WE'RE DOING.

WHAT ELSE? WELL, WE RECORD THE NEXT DURAN ALBUM IN MARCH, THEN WE'RE OFF ON ANOTHER WORLD TOUR. RIGHT NOW THOUGH, ANDY AND JOHN ARE WORKING TOGETHER, AND SIMON AND I ARE HERE IN PARIS RECORDING AN ALBUM. IT'LL BE VERY DIFFERENT TO DURAN DURAN. WE'RE USING LOTS OF INTERESTING MUSICIANS AND I PERSONALLY AM EXPERIMENTING WITH LOTS OF DIFFERENT SOUNDS.

THAT'S WHY I REALLY LIKE THIS NEW KORG DW6000. IT'S A FULL SIZE KEYBOARD WITH BOTH DIGITAL AND CONVENTIONAL SOUNDS. AND APART FROM THE QUALITY OF SOUND WHAT I THINK'S GREAT IS THE FACT THAT YOU CAN SO EASILY CHANGE THE FACTORY DIGITAL PROGRAMMES. YOU CAN MAKE THEM SOUND HOW YOU WANT THEM TO. ALL 64 OF THEM.

AND IT'S VERY USEFUL HOW IT CAN BE LINKED THROUGH MIDI TO THE POLY 800 TOO."

PLEASE PROGRAMME ME ON THE DW6000.

NAME

ADDRESS

EMM 6-85 K

KORG

KORG (UK), 32-34 GORDON HOUSE ROAD, LONDON NW5 1NE. 01-267 5151

AS GOES THE MUSIC...

IBANEZ MASTER SERIES

Music is constantly moving, constantly changing. And so are the needs of today's musicians. They are looking for new avenues of expression, and they're not finding them in yesterday's effects. New music requires new sounds - enter Ibanez Master Series

Ibanez proudly presents nine all new pedal processors guaranteed to make you think twice about your present effects system. Each Master Series processor expands the horizons of its predecessor with new features, new circuitry and a new chassis design. Each has been meticulously designed and built to deliver the most musically effective sounds available anywhere.

But to appreciate all of the Master Series innovations, we invite you to get on down to your Ibanez dealer and audition the Master Series for yourself. Your new sound is waiting for you!

SOUND INNOVATION

Ibanez

For latest full colour catalogue of Ibanez effects send 30p to Summerfield (Dept EMM), Saltmeadows Road, Gateshead NE8 3AJ.