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EMM

ELECTRONICS & MUSIC MAKER
THE MUSIC TECHNOLOGY MAGAZINE

ENO

The E&MM interview

Talk by Gary Numan; gigs by Stockhausen, Man Jumping; vinyl by Paul Hardcastle, Level 42, Robert Palmer

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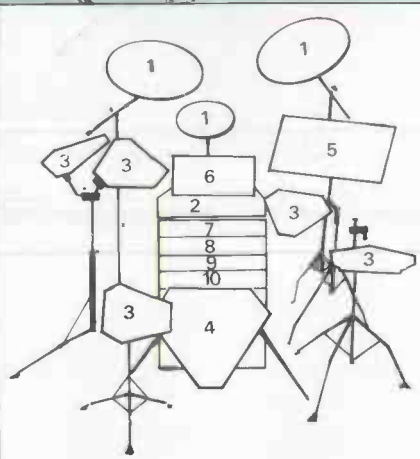

1 Paiste Color Sound 5 Cymbals
2 DDR 30 Digital Drums (MIDI)
3 PD 20 Snare Pad
4 PD 10 Bass Pad
5 PAD 8 Octapad (MIDI)
6 TR 727 Latin Percussion Rhythm Composer (MIDI)
7 SDE 3000 Digital Delay
8 SDE 2500 Digital Delay (MIDI)
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10 SRV 2000 Digital Reverb (MIDI)

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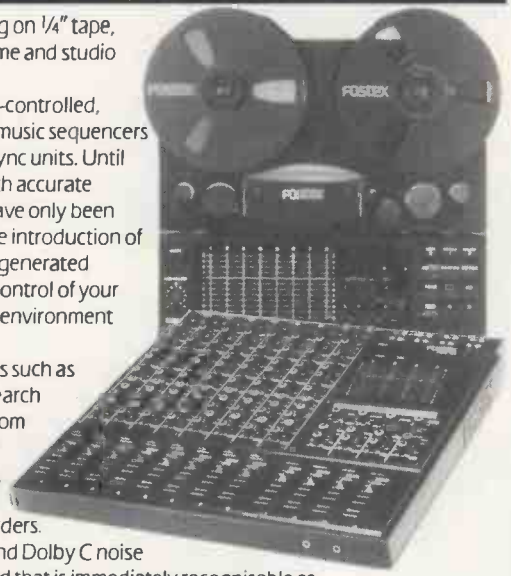

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The Music Behind The Face

For a man whose exterior is not particularly photogenic, Brian Eno has an extremely well-known face. It's a face that rarely adorns the sleeves of his records, and appears even less on the front covers of magazines. When it does, it's usually painted rather than photographed; witness Stuart Catterson's oil painting on the cover of this month's E&MM.

But the reason Eno's visage is famous has nothing to do with external appearances. It's what lies behind the exterior that's important. Because throughout his long and eventful career, Eno has been an inspiration for musicians, composers and artists of all descriptions. Every time E&MM has run a readership survey, his name has figured in the Top Five of contemporary music figures people have wanted to see featured in the magazine's pages. We've battled for what seems like years to get an audience with the man, but it's been an uphill struggle. Almost alone in modern music, Eno is a man who derives little pleasure from talking about himself, with the result that opportunities to interview him occur rarely and at short notice.

Luckily for us, a freelance music writer happened to be in the right place at the right time, and offered us first option on the story. We took it with open arms, and we're glad we did. Alan Jensen's piece is a lengthy one, more detailed than the average E&MM interview. But we feel justified in devoting a large number of pages to it because so many people have expressed a desire to see it, and because it makes easy and rewarding reading.

Considering that he dislikes the idea of doing interviews, Eno has an awful lot to say into the Walkman microphone. Clearly, he's not a man to shy away from the big topics. Art, culture, travel, music theory and The Smiths all feature in his conversation with Jensen, and his comments on all those subjects are well worth hearing. You may not agree with all of them, but they're worth taking the time to learn about.

Then again, perhaps we shouldn't be surprised that Eno is capable of taking on vast, conventional bodies of opinion and coming out on top. He's achieved the respect he has because he hasn't been afraid to take risks, to diversify when he's felt it necessary to do so.

As a musician, he left Roxy Music just at the time when the band had started to achieve significant commercial success. As a composer, he left the safety of the traditionally-structured rock song for the uncharted waters of an entirely new form of music. As a businessman, he put money behind record labels aimed at giving an outlet for fresh, inventive, but totally uncommercial music. And as a producer, he's put hand to fader for a huge variety of acts – Devo, Talking Heads, U2 – and succeeded in wringing the best from all of them.

It's in the role of composer that Eno has had the biggest influence, though in the context of his work, 'composer' is a misleadingly restricting term. When Eno makes an album under his own name, either solo or in collaboration with others, he plays a decisive role in writing and arranging the music, choosing and treating the sounds, and mixing the results into a charming musical confection that's as unexpected as it is cohesive.

That, in a nutshell, is why Eno's influence has been so much more widespread than sales figures for his albums would indicate. Like so much of his music, Eno's sphere of influence is a quiet, unobtrusive phenomenon, something few non-musicians will ever be aware of (though his name isn't far off approaching household status), but which hundreds of today's performers admit to be inspired by.

You can count the number of interviews Eno has done over the last year on the fingers of one hand. Trying to quantify how many other interviewees have named him as inspiration, is an altogether more difficult task. ■

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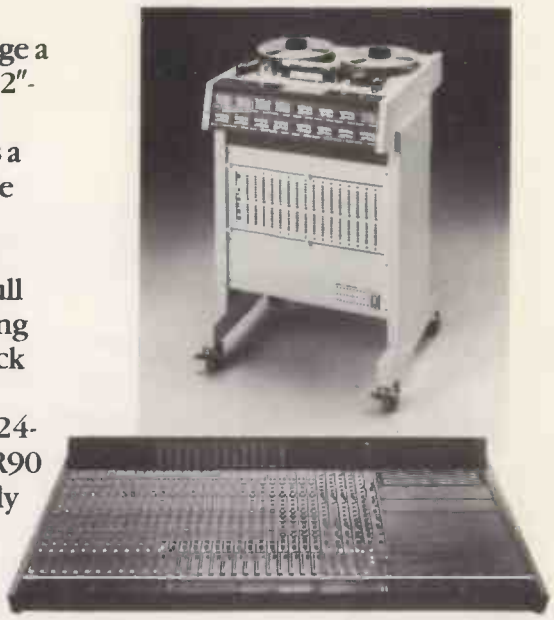

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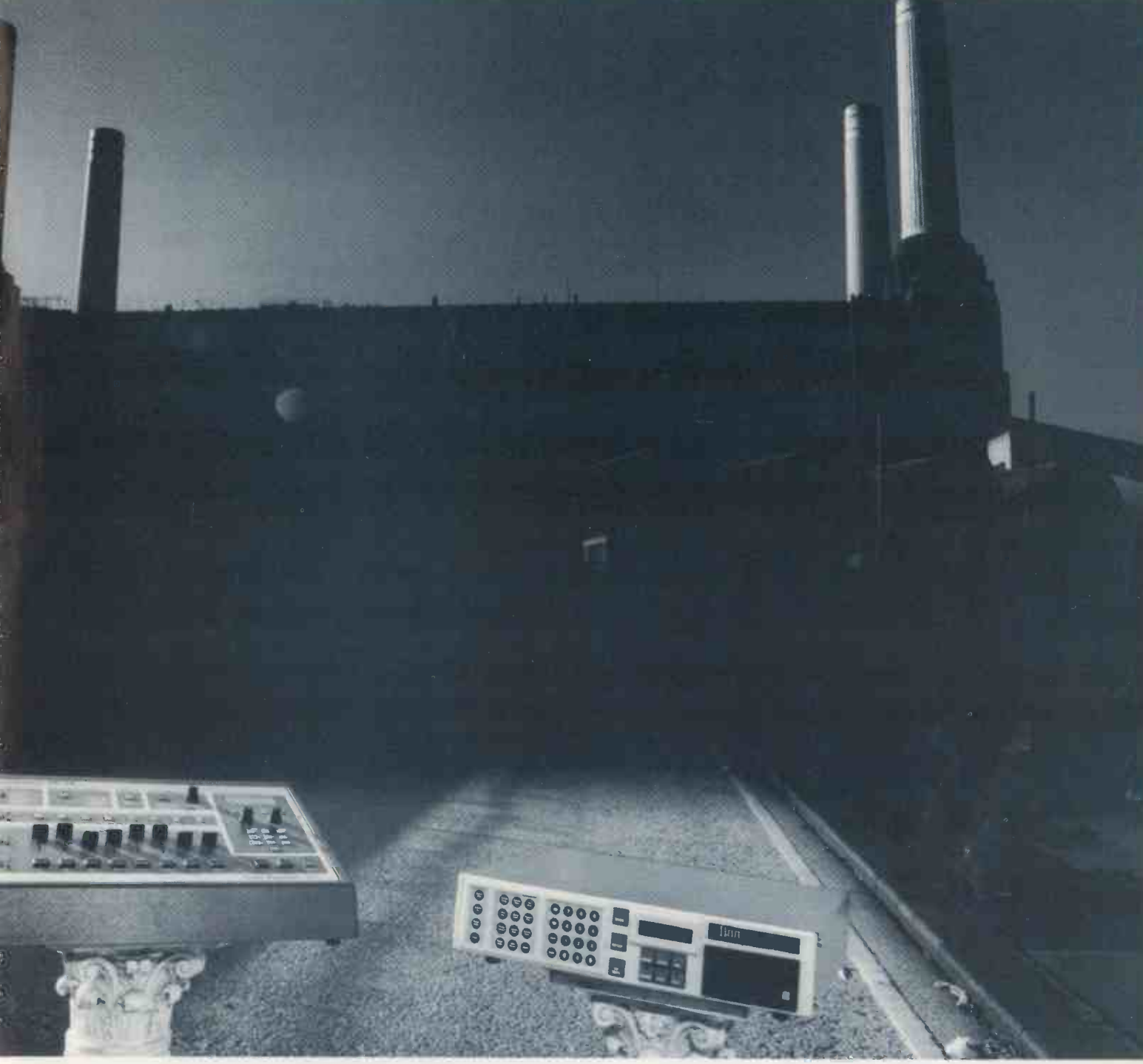

mix level, touch-sensitive buttons and a unique multiparameter mode are included amongst many other new features.

The SCR 2 from Friend Chip is the smaller brother to that industry standard the SRC (SMPTE Reading Clock). Intended for a smaller budget and a less complex application the SRC2 offers many of the features that have made the SRC so essential in the electronic music environment. Two independently selectable click outputs, MIDI and Roland clock outputs, programmable cues, tempo changes and start/stop outputs make the SRC2 invaluable in any situation where instruments from different manufacturers are to be synchronised together, and where it is necessary to drop in with rhythm machines and sequencers rather than running the track from the top.

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Newsdesk

Farm Samples

Good news. The answer to some of your dreams may have arrived. No, not free Emulator IIs in with your cornflakes, but a series of tapes specially designed for people to take samples from. The tapes in question come from ***The Music Farm*** *in compact cassette (1⅞ or 3¾ips, two- or four-track), reel-to-reel and Sony PCM F1 formats, which should cater for most of you.*

All the sounds are presented at concert E, with octaves included for multisampling in some cases. Drum sounds are already treated with EQ, reverb and so on, to help the creative process on its way.

Prices vary from £27.60 for two cassettes to £80.50 for two 15ips reels. Both prices include p&p and get you a total of 200 sounds. F1 prices and a £4 demo cassette of 15 sounds are also available on request from the people responsible. **More from** *The Music Farm, Henfield Road, Albourne, Hassocks, West Sussex. ☎ (0273) 494342/ 492468.* ■**Tg**

Conventional

This autumn's successor to last spring's Yamaha 'X' Series Convention **is scheduled to take place on Sunday, December 8 at the London Tara Hotel, Scarsdale Place, Kensington, London W8. Kick-off time is midday, kicking-out time 7pm. Joint organisers the DX Owners' Club and Yamaha-Kemble UK are hoping that the larger venue will enable more punters to get hands-on contact with as much of Yamaha's hi-tech music gear as they wish. The equipment on show will range from established instruments like the DX7 and RX drum machines, to newer products like the latest round of CX5M software and the brand-new baby DX100 polysynth. Entertainment will also be on offer in the form of a lecture on FM synthesis from comedian and part-time Yamaha demonstrator Dave Bristow, while serious comments should come from Dr Wessel, one of Bristow's colleagues at IRCAM, who Yamaha are flying in specially for the occasion. What's more, a select number of MIDI software companies will also be in attendance, and even E&MM will be there, dumping excess magazines on the unsuspecting public. The best news is that admission to the event will cost you** *nothing*, **so you've no excuse not to turn up. Get there early. More from** *Tony Wride, DX Owners' Club, PO Box 6, Ripon, N Yorks HG4 2QT.* ■ **Tg**

Come in, Alpha

Those Roland people have been rather quiet on the synth front for some while, but now they've come up with a budget polysynth, the Alpha Juno 1, in time for the festive season.

The Alpha Juno, known to its friends simply as JU1, is a six-voice, four-octave monotimbral polysynth with 64 voices in RAM and 64 in ROM. A single DCO is allocated to each voice, and the sound source is taken care of by three pulse and five sawtooth waveforms held in memory, with a facility for mixing pulse and sawtooth waves. There are also six sub-oscillator waveforms.

Other voice components are high-pass filter, VCF and VCA, with a built-in chorus that incorporates variable rate and an eight-stage envelope.

While the keyboard isn't touch-sensitive, the synth can respond to attack velocity and aftertouch over MIDI (as well as a full eight-octave pitch range). Which makes it a good bet as a slave keyboard.

Display is taken care of by a 16-character backlit (hooray!) LCD, while parameter altering is accomplished by what Roland term an 'alpha dial' – otherwise known as an infinite rotary control. Unusually for a synth in the Alpha's price range, a pedal switch and foot controller can be assigned programmable functions.

Meanwhile, no prizes for guessing that sound storage is to cassette (and over MIDI, of course). There's also a programmable one-finger-play chord facility, for all those parallel dominant thirteenth chords you've always wanted to play.

RRP is £575, and the synth will be in the shops the first week of December. And since it weighs in at a mere 12lbs, the Alpha Juno should fit into the proverbial Christmas stocking without much difficulty.

But there is life beyond Christmas, and with the Frankfurt Music Fair not too far off, the first of the Frankfurt news is starting to seep through – from Roland UK themselves, no less.

First off comes tacit acknowledgement of an 'affordable' sampler, in keyboard and rack-mounting versions – but then we might have guessed that.

More concrete information concerns the RDP10 Digital Piano, an 88-note, touch-sensitive affair with eight basic keyboard sounds including upright, grand, Rhodes and harpsichord presets – all of which can be edited. Like the sampler, it'll also be available in rack-mounting form, presumably to match Roland's range of mother keyboards. Now, the RDP10 might sound a bit unremarkable, but the interest lies in a new Roland-patented method of sound creation termed SAS. No, the Special Air Service hasn't infiltrated Japan. SAS stands for Structured Adaptive Synthesis, a computer-controlled sound-modelling process based on real acoustic sounds – though not along the lines of Kurzweil's system, Roland emphasise. At any rate, it'd better be good. RRP is currently set to be £2300. Who Dares Wins, as they say.

More from *Roland UK, Great West Trading Estate, 983 Great West Road, Brentford, Middx. ☎ 01-568 4578.* ■**SI**

Merry Christmas

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But of Course...

Following the recent interest shown by the academic contingent of E&MM's readership, we've received word of some part-time educational courses being run by the ***Hammond School of Music*** *in Watford.*

Before you wring your hands in despair at the mention of the name Watford, I have it on good authority that the establishment is only 18 minutes from Euston, and within easy walking distance from Watford Junction railway station.

Anyway, under the guidance of composer and freelance musician Walter Fabeck are two alternative courses: one a foundation course in Music Technology, the other a guide to Composing ElectroAcoustic Music. Both are run in a specially-dedicated studio equipped with all the relevant goodies like synths, samplers, computers, sequencers and so on.

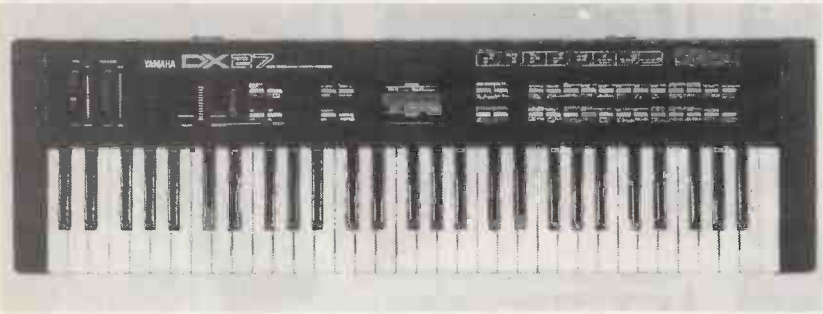
The courses run for 10 weeks at two hours per week, and fees are £45 and £55 respectively. **More from** *Walter Fabeck on ☎ (0923) 39733/22473.* ■**Tg**

FM for £350

Christmas is coming, the geese are getting fat, and **Yamaha**'s range of FM synths is getting fatter still.

The company are due to release two new polys based on John Chowning's wonder-process within the next few months, both of them low-cost machines, and both of them taking Yamaha into previously-unexplored market territory.

The DX27 is a stripped-down version of the 21, itself the subject of the CX5M Voice Editing package reviewed elsewhere this issue. In terms of specification, the two are almost



identical. But by comparison with its elder brother, the 27, loses performance memories, the split/dual keyboard, and a few programmable parameters. But it actually gains in the number of memory locations onboard in ROM: 192 instead of 128. Still, people who like creating their own sounds (instead of listening to Yamaha's) won't be too pleased to know that the DX27 reduces the 21's compliment of 32 RAM voices to 24. RRP, subject to confirmation, is in the £449-£499 range.

Cheaper still, though, is the DX100, Yamaha's swipe at the Casio CZ101 end of the market. Unlike the DX27 – which won't be in UK shops until the New Year – first shipments

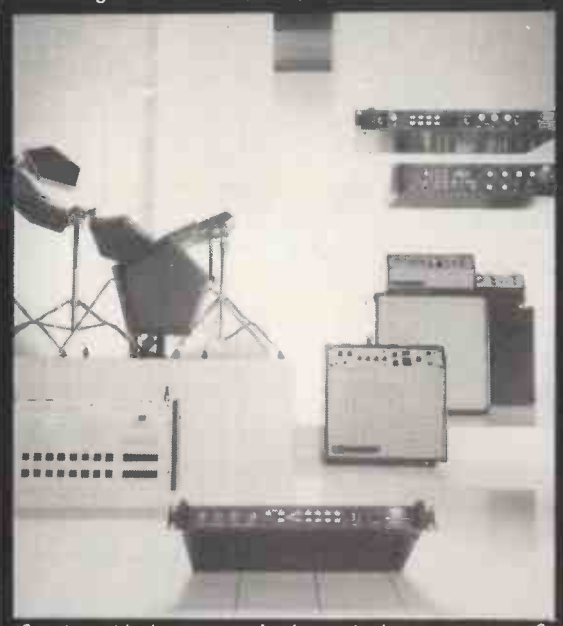
of the 100 could have arrived by the time you read this, such is Yamaha's enthusiasm to capture a slice of the Christmas cake.

Technically the DX100 is almost identical to the 27, but has a miniature four-octave keyboard as opposed to the 27's full-size one, and a couple of ergonomic add-ons to make it suitable for round-the-neck synth playing. RRP – and this is where the crunch really comes – is a measly £349.

More from *Yamaha-Kemble, Mount Avenue, Bletchley, Milton Keynes, Bucks. ☎ (0908) 71771.* ■**Dg**

Dynacord on Display

In the heart of Bavaria, work has started on a new ***Dynacord*** *factory. Meanwhile, the company is busily developing its range of pro music gear in the old factory.*



Starting with the company's electronic drum system, we find that the nerve centre, the Percuter S, is now in series production, to be closely followed by the Big Brain 16-track digital sequencer and, with luck, the Boomer digital sound-sampler, though this may not surface until some time into 1986.

Dynacord have also developed the novel DuoPad, which has separate pickups for pad and rim and lets you assign any of the Percuter S sounds to either of the two. Neat.

The Germans are also going into MIDI in a big way. Their existing outboard effects units, the DRP16 digital reverb and PDD14 programmable DDL, now have an optional MIDI Extension Unit being sold alongside them. More excitingly, Dynacord have also begun marketing a 'MIDI Computer' called the MCC1. An innocent-looking, 19"-racking device, the MCC1 is actually a sophisticated MIDI routing and channel-assignment controller. It provides a total of 99 memory locations in which you can store MIDI routing configurations, and naturally enough, these programs are selectable remotely via MIDI.

But more than this, Dynacord have beaten the rest of the world in fitting MIDI to an amplification system. The company's new range of Reference amps incorporates a couple of models with programmable EQ and reverb parameters, and it's these, not surprisingly, that are the subject of data transfer over MIDI. Moving from one patch memory to another is simply a matter of stamping on a switch on the accompanying MIDI selector footpedal unit, and if you happen to have a MIDI-compatible FX unit in tow, that'll change its program, too.

Yet more inventively, Dynacord are about to unveil a sensational new MIDI-controlled instrument that could force a lot of musicians to rethink their roles. But they won't let us talk about that yet.

More from *Washburn UK, 130 High Street, Abbotsley, Cambs PE19 4UE ☎ (07677) 648.* ■**Dg**

Hard Sell

Living in Stockport isn't easy at the best of times, I know. But if you do happen to be resident in that vicinity, and you're desperate to spend your hard-earned ackers on musical gimmickry, **A1 Music** have opened a new branch to help you. The shop in question is at *3-7 Mealhouse Brow, Stockport, Cheshire. ☎ 061-429 8777.* ■**Tg**

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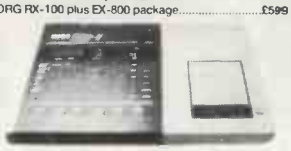

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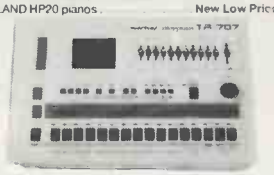

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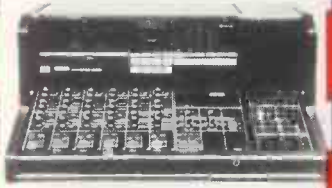

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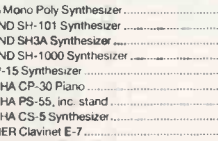

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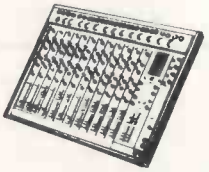

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Don't Fight!

Dear E&MM,

I am not normally given to becoming involved in arguments about extremes. But I've finally been moved to write, in despair, about the main source of needle in your letters' pages over the last few months.

I refer, of course, to the continuing wrangle between FM and analogue synthesists. I've read each and every letter, and found myself agreeing with many points, disagreeing with many more. More often than not, I can't help but feel personally hurt by some of the comments made about analogue synths, and wonder why such emotional comments are thrown at any instrument and its owner.

I personally like analogue synths. They're what I was brought up with, and I find it difficult to summon the enthusiasm to lock myself away with a DX7 for hours. This has nothing to do with any preference for one machine over another; it's simply a lack of understanding concerning the marvel of FM.

But although I don't wish to be dragged into the argument for or against, I do consider that some of your readers have missed the point. Surely if a particular instrument suits an artist, then that one is the best for him or her? It's not the instrument that's important in the first instance, it's the music! Maybe I'm old-fashioned, but I'd have thought that when artists write a piece, they consider the sound usage of their instruments to a certain extent, regardless of the instrument involved. Even the most inexperienced musician will know if one instrument is more suited to a task than another.

I sometimes look back in grief at the sale of my System 100 and RS09, because however much people might disagree, I can't reproduce some of the feeling they had with the machines I have now. I think of them as lost friends.

But time passes and technology moves ruthlessly forward. Let's not forget that the onward march of technology not only gave us electronic music in the first place, it also put it within reach of our pockets. It's here to stay, and there's nothing anyone can do about it. No piece of music technology ever dies. If it did, we'd no longer have the piano, the drum or the guitar. Analogue synthesis may have passed its peak, but it won't disappear. It can't.

In E&MM October '85, Peter Howell of the BBC Radiophonic Workshop said: 'We're not in the habit of throwing things away'. Mr Howell would probably join me in saying that the best way of building up a musical 'paintbox' is collection, rather than replacement. I realise not everyone can afford to keep an old instrument for the sake of one sound, especially when part-exchange deals are getting more and more tempting. I'm a case in point. All I'm saying is: don't criticise others for their choice. We all have a common aim, whether it is to be Depeche Mode or Debussy. Why not respect that?

The same arguments apply to sampling. Whether or not you use it is up to the individual artist and the desired end product. I can't say I'm in favour of the 'patch piracy' that seems to be going on, but again, it depends on how it's being used. I can't help but laugh at the 'it'll never catch on' or 'it's nothing to do with real synthesis' attitudes expressed in some of the letters. Maybe my memory misleads me, but weren't pieces of cut-up tape an important part of the origins of electronic synthesis?

So stop bickering, and channel your energy into the task of creating music.

Mark Keen
West Midlands

French Connection

Dear E&MM,

I have designed a MIDI interface for use with the Atmos and Oric 1 microcomputers that some of your readers may find useful.

To accompany this I have written two programs: a DX7 Dump and a polyphonic one-track sequencer. The latter has single track, real-time recording, and is capable of storing patch, aftertouch, and mod wheel information.

I hope this is helpful to you.

Jean-Paul Verpeau
France

Nobody here at E&MM has yet seen this package in operation, but if any readers are interested, we can supply photocopies of the circuit and parts list for £1. Please send a large SAE with an 18p stamp for return.

Sheffield Sequel 1

Dear E&MM,

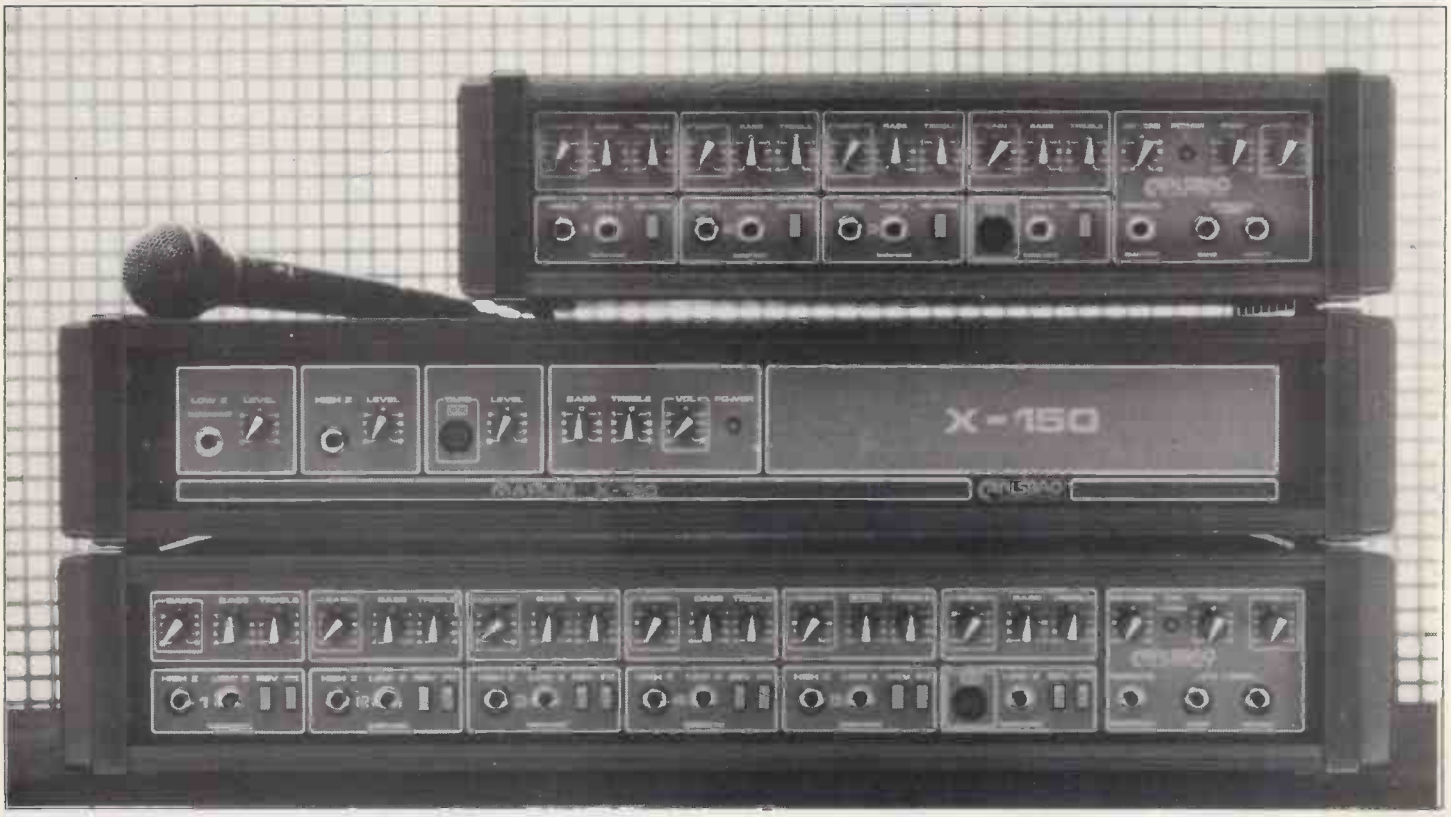
I have just read your report on UK Electronica '85, and would like to offer my own comments.

After spending 16 hours (thank you, National Express) on coaches of one description or another, my companion and I finally arrived in sunny Sheffield for our first visit to a UK Electronica – drawn by the re-formed Ashra.

During our minglings whilst the daytime bands were performing, we discovered that there seemed to be a rather arbitrary method of choosing who actually played. Mark Jenkins was asked because he writes for Melody Maker (where was their review of the fair?) but played well, though a Roland demo would have been more interesting. The abysmal Land of YRX and Ashok Prema were asked because they were old chums of Mark Jenkins. Surely a bit more discretion on the organisers' part would have helped here?

I also note that you forgot to mention one

Watt Options!



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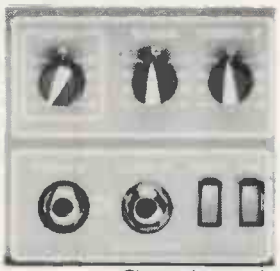

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or two bands, three to be precise: 1) the odd chap with the BR hat, 2) Altres, and 3) Big Amongst Sheep.

Personally speaking, I found Altres to be the most inventive band of the day, apart from the unannounced Big Amongst Sheep: a nicer bunch of people you couldn't hope to meet (hello Ian, Neb, Jude & Jill), and they certainly made our day.

As for the night-time event, Steve Jolliffe was stunning. Somebody should give him a national tour support slot so he can gain some real exposure.

Then there was Ashra. Would they be legendary? Well, not quite, but Manuel Göttsching's guitar playing was worth every minute of the bus haul. Not the best set, but there's magic in them there fingers.

My advice for next year after attending just one UK Electronica is this. Hold it in London, vary the musical styles more, choose people of recognisable talent, have more day-time demos (Yamaha and Roland please), an all-day licence for the bar (a must), forget Mark Jenkins and his gang, and make sure the Tangs headline.

As long as Dennis and the boys don't give up, I'll be there. See you next year.

Alec Black
Ayr

Sheffield Sequel 2

Dear E&MM,

Having attended all three UK Electronicas, I'd like to add my feelings to those expressed in E&MM October.

I agree that the acts were too much of a muchness. Everybody seemed to be stuck in a drum machine/sequencer format, seduced by technology. Even your leader comment in the same issue referred to 'live hi-tech' music, which is surely missing the point.

What the punters want first and foremost is electronics used creatively: it needn't be hi-tech. Ron Berry proved it in '83 with his home-built gear; last year Steve Jolliffe was backed by a humble open-reel tape; and this year, Mike Brooks was one of the better acts despite having some decidedly low-tech synths – it was how he used his gear that counted.

But so far, no one has mentioned what seems to me to be the main reason for UK Electronica's failure – that of poor publicity. Electronic music as we know it gets little or no publicity from the mass media. The only advert I saw outside E&MM and related magazines was a one-sentence mention the weekend before in The Sunday Times – hardly likely to bring the crowds flocking in, I'd have said.

We shouldn't be surprised by a low turnout given this lack of publicity and the fact that the headline act was a band that peaked a decade ago. And yes, Ashra were pretty dire, weren't they?

So, what would be the chances of a half-hour preview on Tommy Vance's Radio 1 prog? He plays Tangerine Dream often enough, so I reckon he'd be sympathetic.

Anyway, I was glad to see Jeanette's and Dennis' comments that UK Electronica will not fold, as it is unique.

Something will always be better than nothing, and three years ago, nothing was exactly what we had.

B J Dawson
Wood Green

Le Strop

Dear E&MM,

This must be said. What the blue blazes has happened to Tangerine Dream?

I refer, of course, to their previous six albums, all released in the last year, two on import. And what have the Tangs' fans got for their money? A heap of self-satisfied monotonous dross with about as much originality as a kitchen table, that's what.

Listen to 'Le Parc'. Can you believe your ears? Surely it must have been recorded for a bet, or perhaps it's an example of zany German humour. Is this really the same band that recorded 'Rubycon', 'Ricochet', 'Sratosfear' and the like?

Their latest soundtrack albums are no better – a collection of twee, unfeeling, factory-produced garbage that would only sound out of place on a Klaus Wünderlich album by virtue of the fact that he records better melodies.

What's become of the atmosphere, improvisation, experimentation and guts, things that were once synonymous with the name Tangerine Dream? It's not as if they can't do better. 'Sorcerer' is the best electro soundtrack ever recorded. Compare this with 'Flashpoint'. Enough said?

Edgar Froese is on record as stating how the Tangs used to fight against Peter Baumann's tendency to make the band's music more depressing. Well I got news for you, Edgar – the present-day uplifted Tangs music depresses me no end, and I doubt I'm alone.

So why do I still buy their albums? Why will I, in all probability, continue to buy them? Partly out of acknowledgement of what they've done in the past, and partly in the hope that they'll redeem themselves as they've done before when all has seemed lost.

But hope is fading fast after the latest soundtracks and the catastrophe that is 'Le Parc'. I have a feeling it puts the lid on them as far as being a major electronic music force is concerned.

If you can't do better than this, Lads, chuck it in and let us get on with mourning the loss of what was once the greatest electronic music band in the world.

If you are going to die, at least do it with a little dignity.

Graham High
Birmingham

Touchy Subject

Dear E&MM,

Like many keyboard players, the first keyboard instrument I learned to play was an acoustic piano. And in spite of competition from different models of synthesiser, I still find myself playing piano. Why? Because there are certain qualities it possesses that I've yet to encounter on a synthesiser.

By comparison with most synthesisers, there's no doubt the piano is very limited: only one sound, no pitchbend, no modulation and so forth. But it's possible to play the piano with a great deal more sensitivity than any synth I've ever played.

This is entirely due to the key response. The JX8P, for example, has a key response similar to an acoustic piano's only in so far as the note sounds louder according to how hard the key is struck. The response does not appear to be linear. If the key is struck slightly harder, a disproportionate increase in volume results. For piano players switching to synthesisers, this is very disconcerting. Obviously, key response varies from synth to synth, as it does from piano to piano, but the feel of the two keyboards is always entirely different.

I realise that electronic instruments with keyboard response closer to that of acoustic pianos are available; they include the DX1 and the Kurzweil 250, instruments that are far too expensive for most people to afford.

Is there any way manufacturers could make this parameter variable, so that players could tailor their synth's response to match their personal playing style?

R Neville
Cambridge

■

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In fact, the AX80 is so easy to operate that others find it hard to follow.

The price is hard to follow too. At under £800 the AX80 is a great buy.

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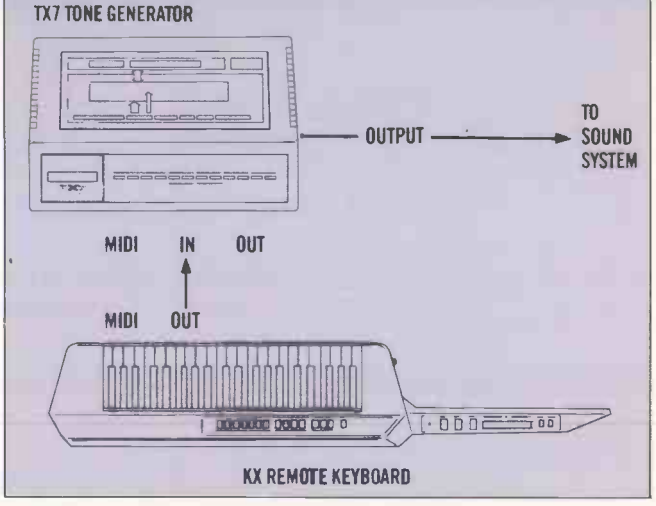
The amazing musical fidelity of Yamaha's DX range of FM Digital synthesizers needs no introduction – there can hardly be a recording studio or professional keyboard player in the country without a DX7. Now Yamaha have produced the **TX7** FM Digital MIDI Expander, designed specifically to enhance and enlarge the already awesome capabilities of the DX7.

If you are a DX7 owner, the **TX7** should undoubtedly be your next step. For less than half the price of a second DX7 it more than doubles your existing creative potential – in real musical terms. Via MIDI the **TX7** combines with your DX not only to extend its existing facilties but to introduce you to a whole new dimension of FM programming.

Composite Programming. The first level of FM is the kind of detailed sounds we are used to hearing from the DX7 and DX9. The second level opens the door to a whole new set of FM programming techniques which involve the complex inter-reaction of different harmonic patterns between DX and **TX**.

Original sounds are synthesized by breaking them down into their component parts. A note from an acoustic guitar, for instance, consists of various elements – the fundamental frequency, its harmonics, the percussive sound of the nail plucking the string, the string striking off the fingerboard, the damping of the string at the end of the note etc. The combination of DX7 and **TX7** vastly increases the wealth of detail your sounds can capture. This can be described thus.

This is the ideal performance system if you want to use a Yamaha KX1 or KX5 type performance keyboard exclusively. The TX7 provides a top-quality FM tone generator, without the need for another complete keyboard.



Think of each operator as a digit in a six-digit combination lock, then increase the number of digits to 12 to represent the addition of **TX7**. You have not merely doubled the number of combinations but have increased it factorially. Sort of like a DX7^2

The **TX7**, like the DX7, has a 32-voice internal memory filled with an exciting new set of factory voices. It also has a tape storage facility making it possible to create inexpensively a large library of sounds on normal cassette tapes. In addition to storing all the standard voice parameters, you can also store all the performance control settings such as voice attenuation and

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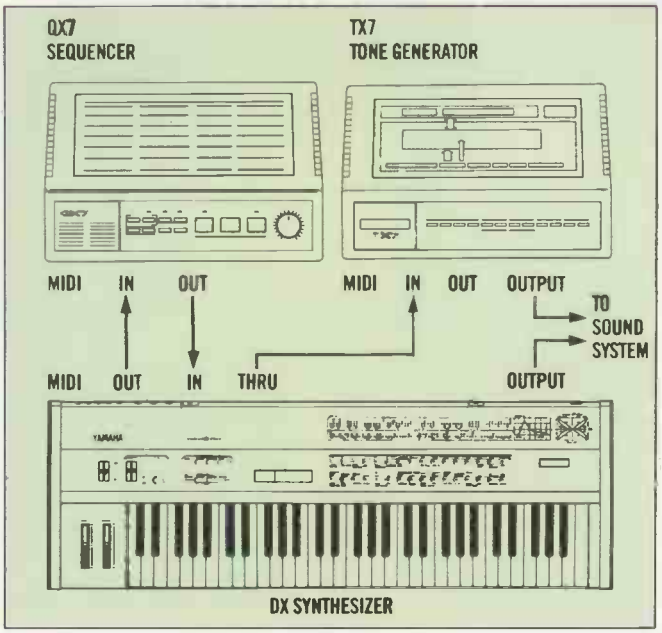

note limit (a sophisticated keyboard split).

Pitch bend, modulation wheel, after-pressure and breath control parameters can all be stored as an integral part of each preset. On top of this the **TX7** has on-board a second set of 32 memories to allow such performance parameters to be stored with respect to the DX7's presets.

All this means avoiding the horrifying discovery in the middle of a solo that the pitch bend range is not what it should be! It's all there in memory for you. And for total performance control even the volume balance of the **TX7** can be assigned to the data entry slider of your DX7.

To further aid your performance or recording sessions Yamaha also offer the **QX7**, an inexpensive MIDI sequencer which can be used like a multitrack tape machine to build up synth and drum machine arrangements, line by line. It will faithfully reproduce your performance or allow you remarkably simple step-time programming which will still remember all your dynamics. The **QX7** has a wide range of editing facilities and can even correct your timing for you. It can control as many as 16 different MIDI instruments or can simply be used as a MIDI drum sequencer with full velocity sensitivity.

Without the assistance of such sequencers, many professional musicians would be incapable of producing the polished performances that we all take for granted. In fact you'll be surprised how easy it is to make your tracks sound tight and professional with a little help from the **QX7**.

The **TX7** and **QX7** have both been designed specifically to work as a unique system with the DX7 although they will also work with any other MIDI instruments. But, then again, there's nothing like the real thing.

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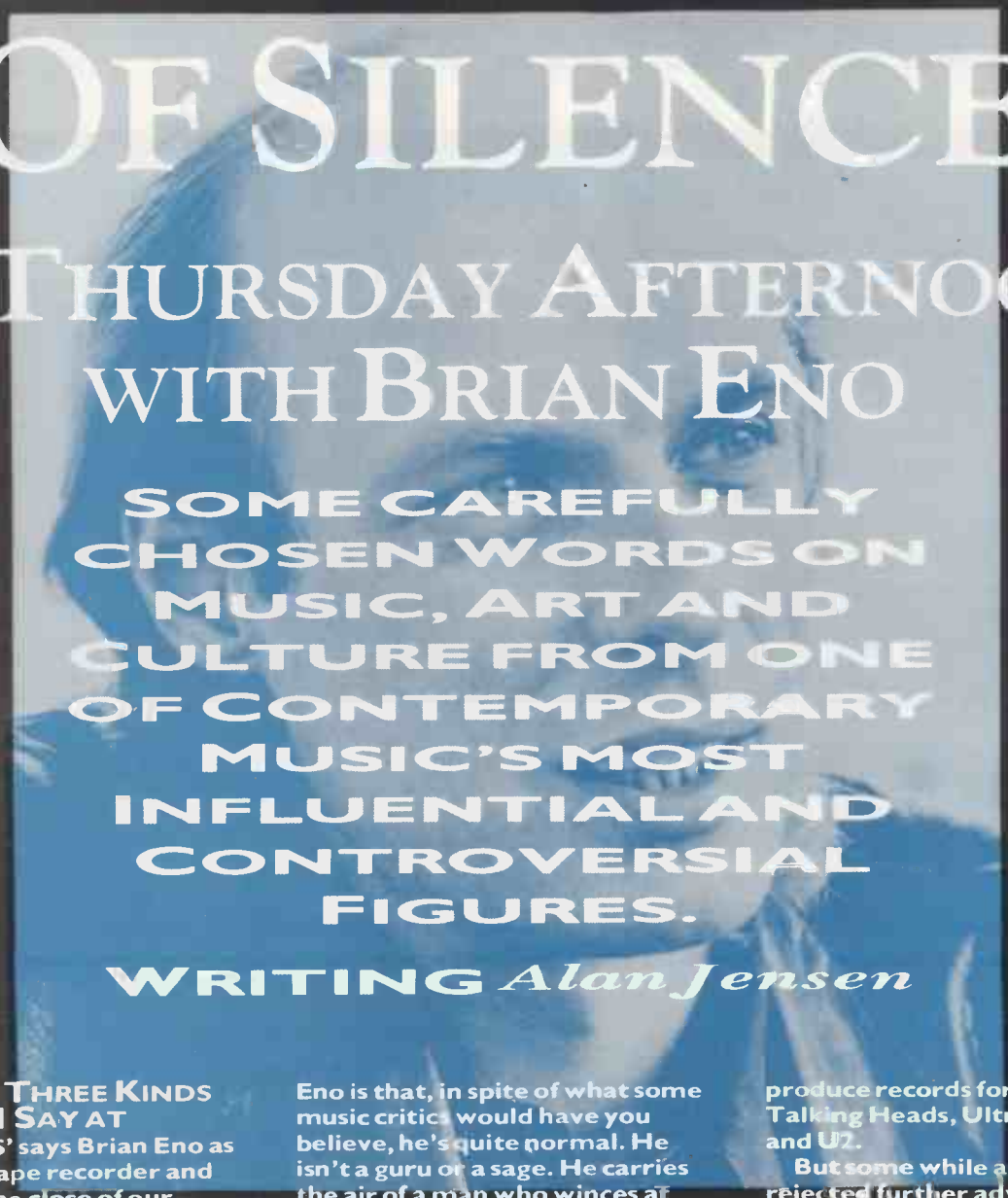

SOME CAREFULLY CHOSEN WORDS ON MUSIC, ART AND CULTURE FROM ONE OF CONTEMPORARY MUSIC'S MOST INFLUENTIAL AND CONTROVERSIAL FIGURES.

WRITING *Alan Jensen*

'THERE ARE THREE KINDS OF THINGS I SAY AT INTERVIEWS' says Brian Eno as I pack up my tape recorder and notebook at the close of our meeting.

'The class one things are really interesting, the class two things are fairly interesting, and the class three things are *boring as Hell*. People always publish none of the class one things, a few of the class two things, but *all* of the class three things.'

That, I suppose, is one of the reasons Eno has never given many interviews. I only got mine by sticking my foot in a lot of doors, being a nuisance on the phone, and being in the right place at the right time. The right place turned out to be the Polydor offices in London, the right time a quiet Thursday afternoon in mid-autumn. Coincidentally (I think), 'Thursday Afternoon' is also the title of Eno's latest album. But more of that later.

The surprising thing about Eno is that, in spite of what some music critics would have you believe, he's quite normal. He isn't a guru or a sage. He carries the air of a man who winces at praise, who shies away from the limelight.

Yet in spite of all that, he's become one of the most influential figures in contemporary music. His records sell in small quantities, and he hasn't had a hit single in his life. But ask many of those who have where they got their inspiration from, and a lot of them whisper reverently: 'Well, it all comes down to Eno, doesn't it?'

Eno was more popular when he played synth (one of the first rock players to do so) in Roxy Music. He was even more popular (in the mid-70s) when he made albums of quirky, eccentric songs with the help of other musicians.

He has achieved popularity indirectly through staying behind the mixing desk to produce records for the likes of Talking Heads, Ultravox, Devo and U2.

But some while ago, he rejected further adventures into the Land of Pop, in favour of a style of music that's come to be known as 'ambient', after a series of records Eno released under that title. It's music which assumes a place in the environment of a room, creating an atmosphere rather than demanding constant attention.

Some of his music has been written and produced solo, some of it has been created with the assistance of others, like fabled Canadian producer Daniel Lanois. Some of his work has been written in response to commissions for film and video soundtracks. Much more of it has been used as incidental music by the makers of television documentaries years after its release on vinyl.

And visitors to this year's Frankfurt Musikmesse trod the endless galleries of moving

walkways to the accompaniment of Eno's ambient doodling, replayed over elaborate but discreet sound systems, in precisely the fashion its creator intended.

Like everybody else who has an ambition to meet the man fulfilled unexpectedly, I had a lot of questions to fire at him. I had decided on my tactics. I hoped to draw Eno out of himself, forcing him to answer those questions on a broad, all-embracing scale. I got more than I anticipated.

He grasped the thread of what I was getting at, often before I did, and phrased his answers in a very precise, thoughtful way, as though he was speaking in print.

Now and again he'd doodle aimlessly on a notepad with a propelling pencil, drawing straight lines and shading enclosed areas as he paused for thought. A few years ago, all sorts of things would have been read into this by hordes of faithful followers. But now, he's just doodling, occasionally using a drawing or two to illustrate a technical point or indicate a particular method of working.

When I got home, I tried manfully to trim down what had been said to short, meaningful paragraphs, the way you're supposed to, concentrating on the class one bits.

Out of context, that sort of editing doesn't really work. And anyway, any less than what I ended up with doesn't really convey the experience of a meeting with Eno, the flavour of the man. So here, with a little chronological juggling, is an impression of a quiet Thursday Afternoon with Brian Eno.

So why is the album called 'Thursday Afternoon'?

Because the music was written to go with a video called 'Thursday Afternoon'. The video was called 'Thursday Afternoon' because that was when it was filmed.

OK, so why has the album been released initially on Compact Disc only?

The quality of reproduction you get with Compact Discs eliminates all extraneous noise. My music is very quiet; silence is very *important* in my music. But then, having no silence in music is like having no black or white in painting.

But the music wasn't recorded digitally. It was recorded on a 24-track analogue machine, and then digitally mastered. The drawback with digital recording is that it only gives you about 15% range, as far as changing speeds is concerned. As I work at a lot of different speeds, this isn't enough. But they'll change that.

I expect I'll be using digital quite soon, though. I'll cut my suit to fit the cloth, make a piece of music that doesn't require speed changes. The only reason I like to change speeds is because it does something to the timbre of sound that I like, by bringing upper harmonics into hearing range, by halving the frequency of them.

I'm starting to understand more about the harmonic structure of sound. I can make sounds, in the first place, that have a harmonic structure like the one I like. In the past, I didn't understand why slowing things down made things sound so much nicer to me. Now I understand...well, I'm beginning to understand. So now I can make them like that without slowing them down.

You've been involved with a good many exhibitions of audio-visual 'installations' recently. In view of that, do you consider yourself a musician, or an artist?

I'd say that any good musician is an artist. I think that in the archetypal sense of the words I'm both, really. I seem to spend about equal time on both...and I mix them together as well. For me there's not a big distinction, because I think about everything in the same way. I'm after the same thing...*things*.

If people ask me, if I'm on a bus or something, I say I'm an artist. That way they don't ask any further questions. If you say you're a musician they say 'Oooh, do you play with a group?', and I can't stand those conversations. I often invent occupations. If I don't feel like

Stills from 'Thursday Afternoon' video ***are reflection of how images are used as visual equivalent of Eno's ambient style of music, which takes its place in the listening environment without dominating it***

Video was commissioned by Sony Japan *who co-operated with Eno in the interests of creating a soundtrack written and recorded specifically for Compact Disc*

▷ talking, I'll just say something like "import and export", and that stops people dead. They don't question you further about what you do, because it sounds so unbelievably boring. "Artist" is like that. It's the truth, but it sounds boring.

What, precisely, are the 'things' you're after in your music and your art?

That's a difficult question, not because I don't *have* an answer, but because I have *too many* answers. What I'm after is creating works of art that are as awesome as the first works of art I ever saw. I'm trying to create an experience that I think of as the artistic experience.

Obviously I can't simply duplicate the things that have affected me that way, because the familiarity of them prevents them from having that effect. The same way, I can't duplicate my own successes, because part of the creation of that effect is making something happen that you didn't expect; using materials you *think* you understand, to create a result you know you *don't* understand. The result is not predicted by the sum of the materials.

I want to make things that put me in the position of innocence, that recreate the feeling of innocence in you.

So you're often as surprised at the results of your work as someone who views it for the first time?

Oh, I always am. I think often I'm more surprised, because I know how it was made. It always seems unlikely that what I end up with has come from the process it has. I use a lot of very cold processes. They seem rather passionless if you describe them, but I think of them as... It's the same as when you're growing a garden. There's a routine part of that. You've just got to water it every day, or whatever you have to do, and it's not particularly glamourous or amazing or cosmic, you just do it. Gardening is an accretion of several processes like that.

And then suddenly, these flowers come out, and they are surprisingly beautiful and complex. What you've done is partake in a process, you haven't really *controlled* the process...you didn't *make* the flower. To see that happen always fascinates me.

When I finally make a piece that is better than, or different from, what I expected, I think: What a lovely feeling! But they don't last for long, those thoughts. I soon go

back to worrying again about the next piece.

How do you go about producing a piece of music? You say you worry about it, so that's obviously the first step, but what follows?

There are many possible first steps, but they usually take one of three forms. One is worrying about it, because I've accepted a commission or something like that. The second is arriving at it from an intellectual position of considering what I've done, sifting through and rearranging it, and trying to include more. That's designing a piece of work and saying *this* is the kind of method I'm going to use. And the third technique is to toy with something, a new piece of equipment, a mode on the piano or something like that. Those things can start developing, of their own accord, into a feasible piece of music.

The third method is actually the way people *think* composers work – though it's not often true.

I don't know if you've ever heard something Samuel Beckett wrote. In that book, *Westward Ho!*, he says: "Try again, fail again, fail better". That's about the state of it I think. It's not a case of expecting to make a perfect piece of work, it's expecting to make a better failure than you did last time.

I really begin by allowing myself to make a mess, and then seeing if I can get out of it. There's nothing worse than a 'blank canvas'. Picasso said there's nothing worse than a brilliant beginning, and that's true. If your first move is brilliant, you're in trouble. You don't really know how to follow it; you're frightened of ruining it. So to make a mess is a good beginning – and I'm quite good at doing that.

What mechanical processes do you go through, working on a piece of ambient music?

I pick a note on the piano. I play it, or get someone else to play it, for several minutes. Sometimes it's more like several hours, piddling around with the sound until I make it sound like a drop of water falling into a pool, for example. Having done that, I then record myself, or an accomplice, playing that note every...23 seconds, or thereabouts. Then I do the same for another note, repeat the process, only this time playing it every 21½ seconds, perhaps. Then I'll get another note played every 17 seconds, until I begin to build up a tracery of notes which cluster together in interesting ways.

So that's a typical mechanical process – quite unexciting, really. Nothing much happens for the first eight or ten hours, doing something like that. You have to suspend your need for gratification for a while and just trust that it's going to work out.

You seem to be quite content working in this fashion, and producing ambient music. Do you have any traditional songs up your sleeve? It's still what a lot of people remember you for, after all...

People are always talking about that. They piss me off, quite honestly, because I know the very moment I decide to do an album of songs, everyone will have finally cottoned on to what I've been doing in the meantime, and they'll say "Oh, why don't you do some more Music for Airports – that was great!" That's what people will be saying in 1989. It's the story of my life!

You know, when I was doing albums of songs, nobody had the slightest bit of interest in them – except people who are now in bands.

Everyone I meet from a band says "Oh God, your albums? Great! Really liked 'em. We based our whole *band* on your idea."

I get this feeling that everyone who ever bought one of my records is now in a band. The mathematics of the situation would work out, I can tell you.

So you aren't going to do an album of songs in the forseeable future?

I just don't think about it, you know? If it happens, it happens. It doesn't preoccupy me much as a subject. I just do what I like doing. I always have done, and I always will...and...the proof of my pudding is that I'm still eating!

I have a wonderful life actually. Everybody I know in the business has got some kind of problem or other. They're tied into something they don't want to do.

Everybody says they don't *want* to write songs, but they've got to! They can't write, they don't have any ideas...all kinds of problems. They all say it. Well, I'm not short of ideas, but I don't have many for songs, so I don't write songs. I do the things I've got ideas for.

Let's talk about something you are interested in. You've been credited with playing a lot of different instruments on your various albums. What's your favourite instrument of all?

I really like pianos. Grand pianos I like a lot. And the tambura, that's a lovely instrument, a kind of four-stringed Indian drone instrument that's always used behind ragas. They pluck over the four strings so it just plays a continuous drone. I guess they're my two favourite instruments.

I like the bass guitar, too. It's the only instrument I have the remotest hope of learning to play before the end of my life – though I don't know what I'll do with it once I've learned. I have a lovely bass. It's an old 1962 Ampeg fretless, an absolutely beautiful instrument, with 'f' holes cut through it. A unique thing, really.

What is it you especially like about the grand piano?

I like it because of the complexity of its sound. If you hold the sustain pedal down, strike a note and just *listen*...that's one of my favourite musical experiences. I often sit at the piano for an hour or two, and just go "bung!" and listen to the note dying. Each piano does it in a different way. You find all these exotic harmonics drifting in and drifting out again, and one that will appear and disappear many times. There'll be fast-moving ones and slow-moving ones. That's spellbinding, for me.

The interesting thing about the piano is that it's kind of a compromised instrument, because of Equal Temperament. You know, no piano you've ever heard is in tune. Pianos are not tuned to be perfectly in tune. You can't do it. If ▷

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▷ you did, you could only play in one key.

That's the interesting thing about chordal music. If you were only going to play in C major, you could tune a piano perfectly in C major. That is to say that the fifth would be *exactly* 1½ times the frequency of the fundamental, the fourth would be *exactly* 1¼ times that frequency, and so on. Each interval would be a perfect ratio, the way Pythagoras planned it to be. But if you do that, you run into a problem if you want to play in any other key. This problem is called the Pythagorean comma or Syntonic comma. If you play in any other key, your fifth, for example, will be several per cent flat. This can't be avoided.

So naturally, most music is written not in C major, or any *one* key; it's written in several keys. Many systems have been evolved to make the compromise. What you do is say that you don't mind some notes being slightly out of tune. People usually decide it's easier to tolerate an out-of-tune third than an out-of-tune fifth, so they make their compromise on the third. There are lots of books about this. It's an interesting subject.

So you find the way people can't tune pianos interesting?

Yeah. I used to think the opposite. I used to think: Piano? Compromise! Pathetic instrument, can't be tuned.

But now I think what makes a piano so interesting is that it's generating so much complex information. Like...if you play an A at 440Hz, it generates harmonics at 880Hz, 1320Hz, 1660Hz, 2220Hz...and so on. These harmonics are *very* important to your appreciation of the feeling of a piano note. If you subtract these and just leave the fundamental, it won't sound like a piano.

To give you an idea of how important they are, take the example of a violin. There are about 27 audible harmonics, and they go up to *really* high frequencies. If you analyse a typical violin playing, for instance, a low D, you'll find that the fundamental note, which is the note everyone will say is being played, has a percentage of energy compared to its harmonics of 0.01%! So a *minute* fraction of the energy of the sound is in the fundamental. Most of the energy comes from the harmonics – and the fifth, for instance, is a C, so they're not even strictly *related* notes.

The nature of acoustic instruments – not synthesisers, I might add – is that they have these complex harmonics. Now, if you hit two notes together, even two notes that are related in a simple way like an A and an E, you get really extraordinary groups of harmonics. Not only do these notes generate *their* whole harmonic series, but the harmonics interact. You get both the product *and* the difference of them.

So the ear already hears very complex sound from a simple instrument. But, *further than this*, because of the problem of Equal Temperament and Just Intonation, because you can't tune a piano perfectly, you never have such a simple interval. There are much more complex numbers than these involved with a piano, and that means you get some much more exotic harmonics, which really are very transitory. It's the most extraordinary instrument for that.

Finding out about harmonics is actually a good way of understanding a lot about music, I think. And finding out about the piano, and about the history of the piano, is like studying a history of music.

So much for traditional acoustic instruments. What about electronic ones?

At the moment my favourite synthesiser is a Yamaha DX7. It's funny; it's the single most popular contemporary synthesiser. Everybody has one. But *nobody* knows how to program them. They arrive with these factory-set sounds and that's all most people use. They *never* change those sounds.

I've become very interested in programming it because it allows you to create different harmonic series quite precisely. In fact, it's really via the DX7 that I got interested in harmonics, not the other way round. I would be doing things on the DX7 and I would notice that certain number relationships were interesting. So then I started getting books about acoustics to find out what I was doing, and how that related to ordinary instruments.

It's a very good synthesiser, I think. In fact, I'm very surprised that Yamaha haven't given me one free. I didn't own one for a long time, but I bought one. I finally gave in. I can't wait for Yamaha. I'll put in a good word for you, Yamaha, even though you wouldn't give me a synthesiser! I know I'm not a big seller...

You've been quoted as saying some pretty controversial things about the purpose of music. Can you put the record straight?

That's a *big* question!

It doesn't have one purpose, that's the thing. It has all sorts of purposes. All of those might be subsumed into one basic pursuit...which is the pursuit of 'culture'.

OK, so what *is* culture? It's the way human beings transmit certain types of information to one another. There are two ways of transmitting information. One, which is often genetic, is what we all do, quite accidentally, by having children. All creatures transmit information about their environment genetically. A species is the sum total of genetic information. So, that's one way of transmitting information and it's...slow. And it is not accessible, the information is not available instantly. It's available only to the next generation.

Humans have developed another way of transmitting information, and that is 'culture'. Culture subsumes all kinds of things, like mathematics, language, art, science, all those things. These are all ways not only of understanding things about the world, but of finding ways of telling other people. Some of them are very definite, like mathematics. Latin was quite a definite form of transmission, which is why it was the universal language of the middle ages.

Others aren't so definite, but that doesn't mean they're of a lower quality of information. It just means that it's a different type of information that isn't susceptible to definite terms, definite language. Part of the nature of the information is that it has to be re-experienced and rediscovered by everybody.

I can't *tell* you about a musical experience. You might be able to understand my words, but it's not the same as having that musical experience. If I go and hear a new Steve Reich piece, write a report, and give it to you, you're not going to go "Oh God! It's beautiful! Oooh!" Some experiences are not susceptible to the same kind of language. So people keep *making* these experiences.

Culture is all human behaviour, outside of pure instinct. Everything we do is cultural: gardening, cooking, different fashions, architecture.

What artists do a lot, in music in particular, is look at culture in the world. Music doesn't depict something, it's about other music. So quite a lot of the business of 'culture merchants' like myself is studying how culture works – how it changes and how it changes us.

People who write about culture, critics and writers don't *think* about culture. It's not something they understand as a whole field. They think: Culture? What's that? Name of a reggae group, isn't it? And if you do say 'culture' they think it's some snobby word for some kind of arty shit; nothing to do with passion and 'on-the-strings'. But ghetto-talk is culture, as well. Breakdancing is culture. The Smiths are culture...

...What do you think of modern pop music?

I rather like them. The Smiths. I think they're a good band. I think Morrissey is an extraordinarily arrogant person, especially considering that he's probably *the* most successful tone-deaf singer the world has ever known. But that being said, I like his singing quite a lot, and I like their records. I could live without some of his studied miserableness, I suppose.

But I don't listen to records much.

Is that a deliberate thing, or do you find you just don't want to?

I don't think about it. I don't have a record player, funnily enough. I think life's too short to listen to records, at the moment. Well, I do listen to *some* things, but I usually like to listen to the same thing over and over for months.

I'm quite happy to accept that I don't know most of what's going on in the world of music. I never have done. You have a choice when you get interested in culture. You have a choice of trying to absorb it all, the American style of 'doing the sights' in two days, or else you can just decide: "I'll stay in this one place, because I like it here anyway, and I'll really understand this. I'll really find out about it". That's what I do.

I was in Venice a while ago. I had an exhibition there. Venice is a beautiful city. I'd see wolfpacks of Americans, running around with Nikons flying off their backs, bursting into quiet squares with a great crunch, going: "Ahh, where's Saaaan Marrrco?"

So I spent most of *my* time sitting in the back garden of a friend of mine. She has a back garden with high walls all around it, and all you can see is the tops of some other Venetian buildings. You can hear the gondolas going by.

I have the arrogance to believe that you can find out a lot more about a place that way, than you can by seeing the sights. I've seen San Marco a million times on postcards, and the real experience isn't dramatically different. But I've *never* had the feeling of sitting in a Venetian garden and hearing that sound of the gondolas splashing by.

Just to sit in one place and to soak up the atmosphere of that place...I mean, all spots have the same atmosphere at a given location, and somehow I think tourist sights have been robbed of their atmosphere by being tourist sights. It's as if taking too many photographs of something eventually makes it become unreal, become an image of itself. So I like, with music and with everything else, to stay in the same place for a long time...until I feel like moving somewhere else, then I stay *there* for a long time.

I've been living in Chelsea for a while, but I don't particularly like it. I've seen a flat this morning that I like a lot. So I might be living in a proper place soon. Expensive, though.

Are you an intellectual?

Sure! Most people are. I don't know what that word means, really. What does that word mean? Someone who uses their intellect? What do you think it means? That's my question to you.

Well, are you a person who reacts to things intellectually or do you react to things with your body?

I do them both. The former usually follows the latter. The first reaction is physical or emotional. But then I want to know *why* I had that reaction. I like to think why things have happened in a certain way. Is that what you mean by being an intellectual?

People usually use that word in a condemning sense, of someone who can't react in any other way, of someone who's detached from their real responses, because there's a huge body of 'theory' that dampens every situation. Well, there are certainly people like that, but I don't call them intellectuals. I call them 'clever people', 'brainy people', 'eggheads'.

...I know I have a bit of an egghead; physically it's a little bit that way I know. But that's an unfortunate accident of nature. If I were a swarthy, ruddy Italian, with a greasy forehead, nobody would ask me if I thought I was an intellectual. I could say what I liked.

I think people who say they despise intellectuals are frightened of knowledge in some way. They're frightened that to understand something is to rob it of its power. In my experience that is *never* true. First of all, you can never understand something totally. But when you begin to understand something, you realise how much more there is that you don't understand.

Take that book on the table there. It's a book on the paintings of Ron Kitaj. I follow his work really closely. I like it a lot. I'm always looking at his work, and reading everything I can about him...and I try to understand this guy. Now, has this lessened my appreciation of his work? No, it hasn't. I find it even more fascinating and interesting than I ever did before.

People think that to explain something is to explain it away. That's not true.

You've been fairly nervous throughout this interview. Do you like talking about yourself?

Ah...yes. Well, actually I don't particularly like talking about myself. I'm not that interesting to me, because I live with me all the time. So there's no glamour in me for me.

But I like talking about ideas. I find them terribly interesting. God! When I lived in New York, I used to like overhearing conversations at café tables. That's a good way of finding out about a city, as well, much better than sight-seeing. In New York, everybody talks about themselves. The word 'I' must permeate the air. If you could clean the air of every other word and just hear all the I's sticking out, it'd be like rain...I,i,i,I,i,i,I...

Everybody just babbles on about themselves. They all think they *matter* to the effing world. As if the existence of any of us makes any difference to anything.

One of the nice things about the kind of music I'm doing now, is that it makes me feel quite unimportant. I like that feeling. Rock music, on the other hand, tends to make you feel *very* important. ■

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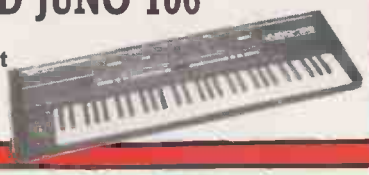

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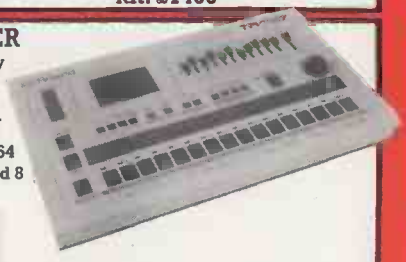

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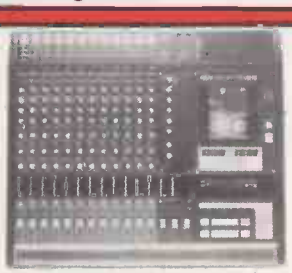

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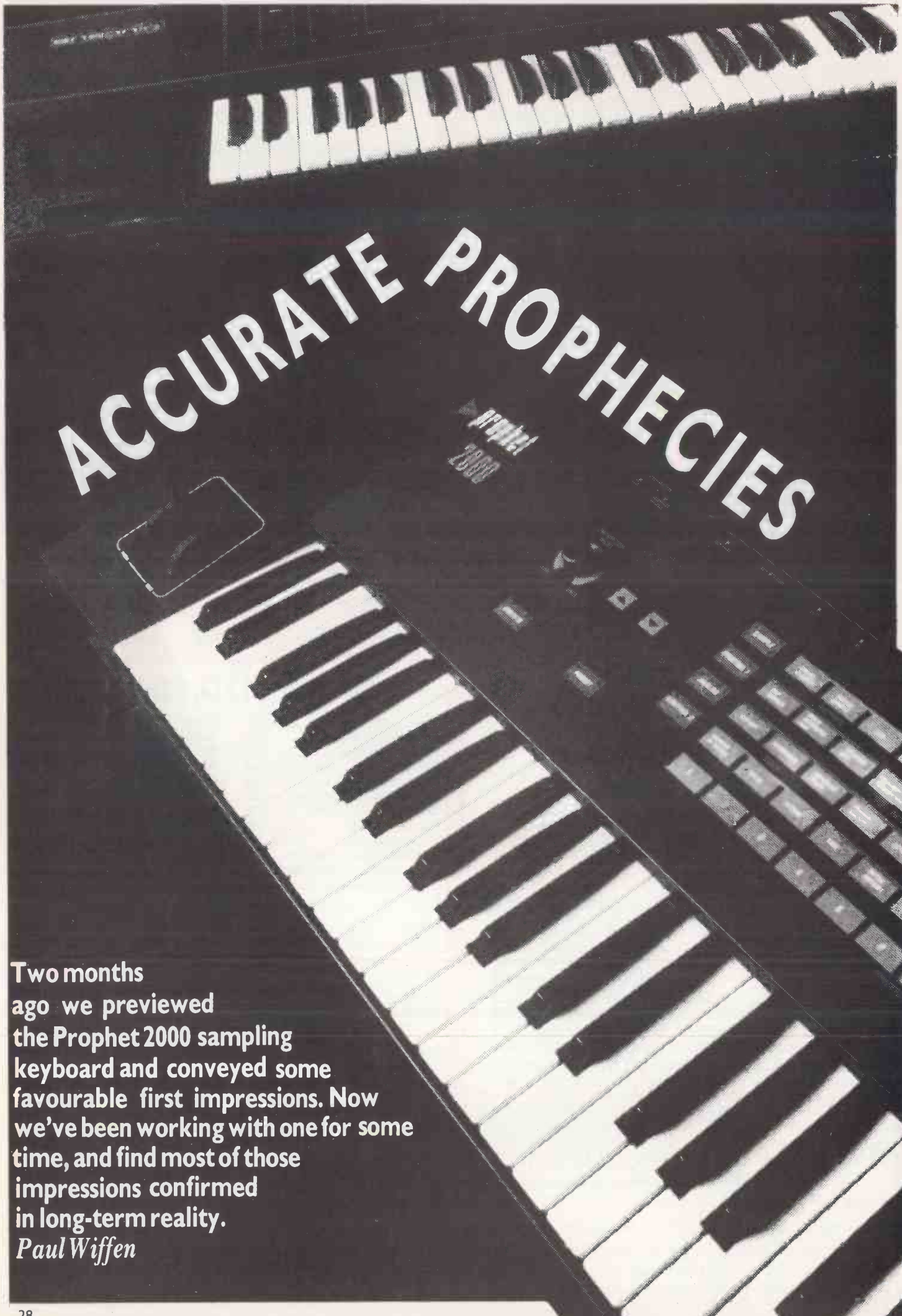

Two months ago we previewed the Prophet 2000 sampling keyboard and conveyed some favourable first impressions. Now we've been working with one for some time, and find most of those impressions confirmed in long-term reality.

Paul Wiffen

A name has returned from synthesiser history. A name which was synonomous with professional polysynths in the days when the DX7 wasn't even a twinkle in John Chowning's eye, let alone a gleam in the Yamaha salesman's. Maybe I'm being a bit overdramatic, but it does seem like a long time since the days when *every* keyboard player wanted a Prophet 5. Actually, it's only been two or three years, but a week is getting to be a long time in electronic music hardware.

Anyway, the Prophet name has now returned, and Sequential (or SCI as they were known in the days of the Prophet 5, 10, T8 and 600) are obviously hoping its revival will bring about a revival in their fortunes. For truth to tell, some of the company's recent instruments have been less than a complete success. Uninspiring, half-baked machines, developed too quickly and sold too cheaply, were never likely to live up to the standard set by the Prophets and, more recently, the excellent Drumtraks digital drum machine.

No. Sequential's future lies not in producing Californian Casio-beaters. It lies in the production of sampling keyboards, something the Californians already do rather well in the shape of E-mu Systems and their Emulators.

The Prophet 2000 had been quite a closely-guarded secret until a couple of months back, when two or three machines made their way over to Europe, and one of them did the rounds of the music magazines in the care of a Sequential salesperson. Since that time, it's been down to me to demonstrate the machine to a few would-be customers, a job that's entailed having to learn a lot about the 2000 in very little time.

It's been productive, though. I now know more about the new Prophet than anyone else in Britain (or at least, I think I do), and I've been able to come to some very definite, on the whole favourable, conclusions about it.

The first of these conclusions is simply that the Prophet 2000 sounds wonderful. But that on its own isn't enough. We have to know *why* it sounds wonderful, because if we don't know that, we won't know whether our conclusions are based on scientific fact, or on the tricks our ears play on us when we've had one too many pints of the amber nectar.

Sample fidelity is a product of three factors: sample resolution (how many bits), sample rate (how often), and technical implementation (how good the design is).

A design like the Emulator II, with limited paper spec (8-bit, 28K), actually sounds better than many theoretically superior hardware systems, because of some design genius at the companding end of things. Meanwhile, the fidelity of the Synclavier's 16-bit, 50K sampling has never been in much doubt, because the specs means you need to be a complete aardvark to go astray from such a high-performance starting point.

The Prophet 2000's analysis is 12-bit, its sample rate is selectable between 16K, 31K and 42K, and its technical implementation is superlative. The result? An instrument that sounds brighter than the Mirage, more immediate than the EII, and more transparent than the Kurzweil.

This isn't just a feeling I have after a couple of hours' listening across a crowded room. It's the result of sampling all sorts of things, from all sorts of sources, into the new Prophet and expecting the worst. But from Sony PCM F1 or Fairlight, Mirage or live musician, the sounds all went in and came back sounding near-as-damn-it identical – all with the minimum of fuss.

At a 16K sample rate, you can get away with bass drums and other low-pitched sounds; at 31K, 99% of all sounds are extremely faithful to the original; and for those tricky cymbals and ambient, low-level sounds, 42K does the trick. Thus you can choose between memory economy and ultimate fidelity at the flick of a switch, depending on the kind of sound you're sampling.

What I found most surprising was how simple and direct sampling could be on an instrument of this price. I managed to get a couple of hours in at a recording studio (thanks to Martyn and Greta at Paradise) to take advantage of mixing desk, outboard effects and the like with the idea of tweaking sounds – and found that this was almost unnecessary. No pre-emphasis (boosting the treble to prevent top-end loss resulting in duller sounds) was needed, and nor were any other of the other techniques which have become the sampler's stock-in-trade.

Sampling ***'I got a couple of hours in at a recording studio to tweak samples with a desk and effects – and found it was almost unnecessary.'***

More specifically, one of the things that strikes you instantly about the 2000 is how immediate the attack to transient sounds is. This is something several excellent sampling systems have trouble with: drum sounds just do not have the same punch as the originals. Now, I've always ascribed this to programmable VCAs and VCFs not having a fast enough rise time, a suspicion that's given further credibility by the fact that drum machines – which have only static filters and no programmable VCAs – don't seem to suffer anything similar. Yet despite having both of these, the Prophet has a sharpness of attack more akin to that of the Emulator SP12 than that of a keyboard.

Emboldened by the lack of processing used in the studio, I took to sampling direct into the machine (a technique I'd previously advised people to *avoid* when sampling) either from CD or with a mic. Here I was greatly aided by the provision of both a mic/line level switch and an input level control. The LEDs on the front panel act as a VU level indicator: they hold peaks and display overloading clearly, though I found that, in any case, severe clipping had to be present before the sample quality deteriorated audibly.

The Parameter knob sets the threshold level when you're in Sample Record mode, and adjusting this is simplicity itself, as a flickering cross in the display shows you whenever the threshold has been exceeded. This makes setting the optimum threshold level *much* easier. The only thing you have to watch when switching to another parameter to adjust something else is that when you go back into Sample Record, the threshold is automatically set to the control's new level.

Having set a sampling rate, you allocate an amount of memory (up to 128K) to your sample. The Prophet actually has 256K of sample space, but this is stored in two separate blocks (Left and Right, or A and B) which cannot be combined, just like Upper and Lower on the Mirage.

The length of time you sample for is a product of the size of memory you assign and the sample rate. 128K gives you just over three seconds at 42K, just over four at 31K, and just over eight at 16K.

When you've set your level, your size and your threshold, you simply press Execute and wait for the next time the threshold level is crossed. As soon as it is, sampling begins. And when this happens, an 'S' appears on the LED display to let you know that the machine is engaged in the actual sampling process.

You can hear a sample on the keyboard as soon as it's been made, by moving to the Sample Number Parameter and pressing Execute. This overrides whatever maps and presets may be set up, and places the original pitch at Middle C. If there's a problem, you can go straight back into Sample Record for another go.

Once you have a result you're happy with as a starting point, you can immediately begin editing it (without all that tedious moving about between modules). You can alter the start and end points of

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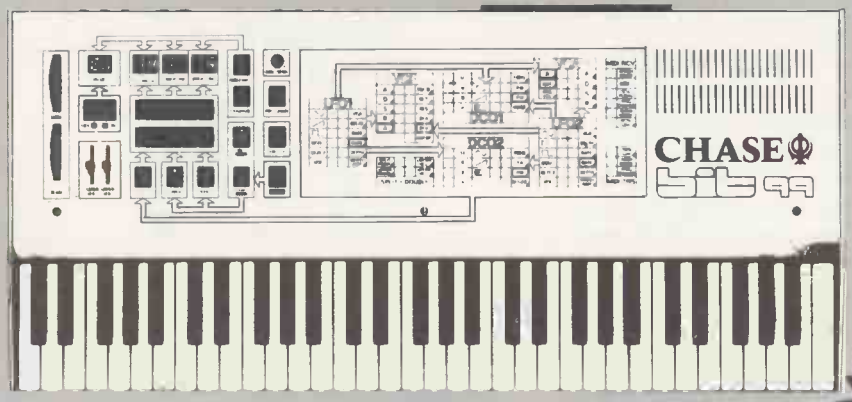

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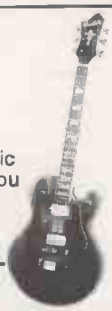

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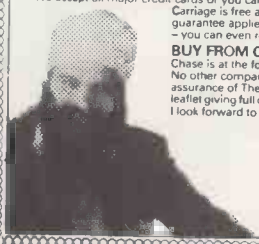

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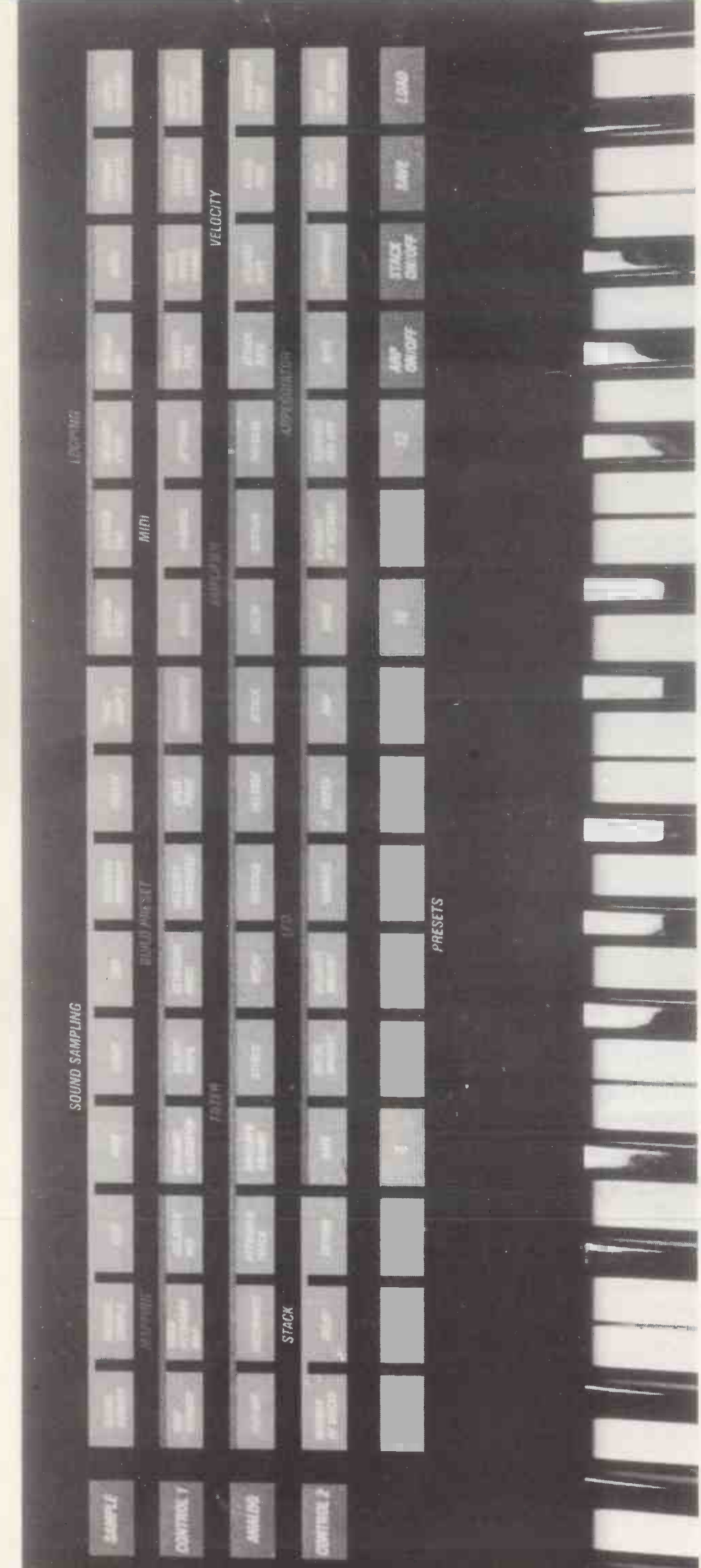


▷ sample playback, using the Parameter control to step through in blocks of 1K and the up/down switches to move from one zero crossing to the next. The latter feature is extremely useful, as beginning and ending at zero crossings removes any unwanted clicks or clunks. (All right, I'll explain. Zero Crossing is a sample in which there is no sound present during the sample time of about 30-40 microseconds.) Naturally, the ability to step through zero crossings is worth its weight in gold when you come to looping.

This is the area where memory can be used most efficiently, provided you can find those elusive ideal loop points. More and more machines are providing looping aids these days, and here the 2000 again excels. There's more to it than the stepping-through of zero crossings, too. If you go past a good loop inadvertently, you can step back to it. The looped section sustains infinitely, so you don't need to keep a finger depressed on the keyboard, though it would be nice if you could use the keyboard to change the speed of playback so that you can check loops at different pitches to see if they are equally invisible to the ear. At the moment, you have to come out of Loop Edit mode to do this.

Surprisingly, the Prophet provides you with two loops for each sound: a Sustain Loop and a Release Loop. This means you can loop a different section of the sound for the release portion which, in turn, means you get more authentic copies of 'real' instruments.

And if one sample with two loop points doesn't give you everything you need, you can combine samples in a variety of ways. You can mix two samples together by digital addition, using the Balance control to adjust the level between the pair. Or you can append one sample to another, at any point you mark with 'End' on the first sample and 'Start' on the second. Before or after either of these operations, you can reverse either the original samples or the result of your meddling, so overall, the range of options open to you is a pretty flexible one. So flexible, in fact, that repeated use of these features enables you to build up sound collages, and experiment with digital editing, in the same way as the pioneers of *musique concrète* used to do with analogue tape.

Once you've perfected your sound as far as the digital process will allow, you can get back to your analogue roots and do all the serious stuff with dynamic filters, envelopes, and the like, thanks to the 2000's analogue synth section.

But how is old-fashioned, analogue Prophet technology going to help digital sound better? Simple. Using an ADSR, for instance, you can cut out any undesired high-end problems such as noise in the original sample, or bring out interesting frequencies in the sample with resonance. The amplifier ADSR is equally useful, for smoothing out rough starts and finishes.

But both sets of controls really come into their own when you add a third ingredient: velocity-sensitivity. Now you can use the way you play the keyboard to alter the brightness (filter) and volume (amplifier) of your samples. Not convinced? Well, imagine sampling everything flat out, snare drums hit with huge vigour, pianos thumped with a vengeance, Gibsons distorting through Marshall stacks, and then introducing these subtle nuances of timbre and volume using gentle strokes on the

keyboard.

What's more, and here we have another Sequential first, you can actually delay the point at which the sample readout starts with a soft key strike. In other words, if your cellist's bow bit into the string rather strongly as he attacked the note you sampled and you occasionally want something a little less forceful, you can program things so that a soft key-strike misses the front part and starts playing the smoother sustain section.

This vital technique for producing an authentic replica of an instrument over five octaves is so well-integrated into the 2000's architecture, you don't even need to select a special option to employ it.

The sample memory of each side of the keyboard can be split into as many as eight separate blocks, and these are then mapped onto the keyboard at will to create an 'instrument' (a piano or a drum kit, say) over more than the 2½-octaves each sample can be played over. You can make global parameter changes for each map, so that having adjusted each sample to match them up, you can mess about with them all at once if necessary. Having built up your maps, you can then combine two of them together into a preset.

When you load a factory disk into the Prophet 2000, you use the presets to access the sounds. The 12 presets can be used to make different arrangements of the same sounds, or each one can access a different pair of samples to give complete sound changes.

It's within the preset area that all the clever things like keyboard splitting and layering, velocity switches, crossfades and positioned merges are set up. Each preset draws upon two maps to create its overall set-up, so that only one merge over the five octaves is possible (not as useful as the EII, where any number can be set up), but this aside, there are virtually no limits as to what you can do: drum kit one side, flutes the other; a piano doubled with strings; marimba on hard strikes, glockenspiel on soft. If you can squeeze it into 256K of sample memory, chances are it's possible. And all these goodies are accessible instantaneously in real time, something that helps get round the fact that load times can be as long as 20 seconds (the 2000 has over twice as much memory as the Mirage) by letting you keep different sounds for the same song available in memory at the same time, all loaded from one disk.

Luckily, Sequential have realised that the floppy disk is not the most reliable of storage media, for the 2000 has its complete operating system on ROM. In other words its brain is internal and inseparable (except to an engineer with a screwdriver and an EPROM remover) from its body, a state of affairs which I find very reassuring. Even if you lose all your disks, it won't stop you sampling new sounds.

If you turn on your 2000 without a disk in the drive, it downloads from ROM a series of waveforms into the sample memory area. Then, using the analogue parameters, 12 presets are made up using these waveforms, which are made by a mixture of additive and subtractive synthesis. At this point, it's worth dispelling the rumour that the 2000 'comes with Prophet sounds built in', which implies that the old analogue oscillators that gave the fat, beefy synth sounds of yesteryear are present in the sampler of today. True, the 2000 still uses the old faithful Curtis chips for filter and amplifier, but the basic waveforms that make the new Prophet's sounds are digitally generated, digitally encoded in ROM, and then read into the D-to-A converters just like the samples whose place they are occupying.

Listening to these sounds, this is fairly clear straight away. They have more in common with the clear, bell-like sounds of the current Yamahas, Korgs and Casios than the great American analogue synths of the past. These combination analogue/digital sounds provide usable alternatives to sampling, and would certainly get you by in an emergency. There are organ sounds, bell sounds, plucky synth sounds, and other typically digital voices. You can edit the sounds and store your own versions of them on disk, but more significant is the possibility of using them alongside or in digital combination with samples.

However, I can't help feeling that if any waveforms are going to be permanently implanted in ROM, there are more commercially-popular choices. Maybe the ROM available in the 2000 is insufficient, but I'd have thought a built-in piano or strings sound would have been more useful.

Synthesising *'I'd have thought some built-in piano or strings sounds would have been better than the synth presets resident in the 2000.'*

In many ways, you get the feeling that the way the Prophet 2000 combines synthesised and sampled voices is only the tip of the iceberg, rather than the ultimate in sound manipulation for years to come.

But if the ROM-based synth sounds do little to make a strong initial impression of what the Prophet 2000 is capable of, the factory sample disks do even less. For while the sound quality of individual samples is often extremely high, they are patchily assembled into presets.

Played within certain regions, the piano sounds excellent: rich and growling down the bottom, clear and sparkling at the top. Trouble is, the sound changes in character spasmodically several times in between. So much so that around the fourth C up, there's what could almost be described as a wah-wah effect. As they used to say on your School Report – 'needs work'.

The strings sound is rather thin and unsatisfying, and the strings/brass disk as a whole is irritatingly set up and leaves areas of the keyboard unassigned.

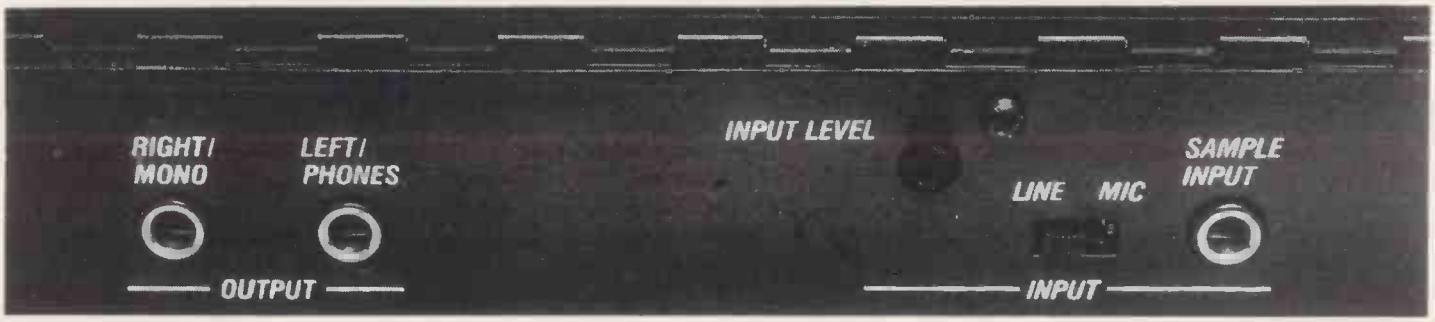
The third disk is more promising, with an excellent acoustic guitar (steel strings sparkling beautifully). Coupled with a useful organ sound, this is the best of the three disks you get with the 2000, but, just to prove that every silver lining has a cloud, there's also an utterly unusable bass guitar sample.

I strongly suspect that by the time the second wave of 2000s hits Europe, the problems noted here will have disappeared. Not that you should care, anyway. What matters is that the new Prophet is capable of storing some *tremendous* sound samples, if only you've got the courage to leave the factory presets to one side and do some sampling of your own. If I had my way, all factory sounds would be withdrawn from instruments a week after their purchase – *then* we'd find out who the real programmers are.

Besides having a full compliment of the usual MIDI specifications, the Prophet 2000 has several major innovations based on the universal interface standard. Passing quickly over the standard Omni and Poly modes (though there's an expansion on the latter that allows you to assign a different MIDI channel to the left and right memories), let's get onto the meaty stuff.

The first innovation concerns MIDI mono mode. In the original MIDI spec, mono mode was included as an option to allow each voice of a synth to be addressed separately by an external controller. On the 2000, this would mean eight channels accessing the eight available voices. However, Sequential have taken this a stage further by enabling the 16 available sample locations to be accessed on 16 separate MIDI channels. This means that, using most MIDI sequencers, you can sequence 16 different sounds simultaneously, provided only eight are sounding at any one time. Neat, huh? You should hear it. And don't be misled by the word 'mono' in this context. It refers to the MIDI mode, not a lack of polyphony. Provided you don't exceed eight notes at any one time, you can have eight notes on each track, so each track can be fully polyphonic to the hardware limit of the 2000. In reality, you're unlikely to use this to its full potential, as if you're using a few drum sounds, bass and lead lines, you'll only need to hear some of those sounds monophonically anyway.

Then we come to expansion modes, a concept unique to the Prophet 2000. Each of the three modes (omni, poly and mono) can be used in an expanded format. What this mode does is to not transmit anything over MIDI until all eight voices are ▷



being used. So, instead of stealing voices to play new notes as in the normal playing mode, any notes that exceed the instrument's eight-voice capacity are transmitted via the MIDI Out socket. This means that a second (or third, or fourth) 2000 connected and loaded with the same disk can provide these extra notes automatically. Just think of the advantages. 16-note (or 24-note, or 32-note) piano chords, splits and doubles that don't deprive you of polyphony on each sound, and best of all, in mono mode, the ability to play 'live' all the separate samples polyphonically, which you can put down track by track in the studio.

sound samples use up a lot of MIDI data, so transferring a sound over MIDI can be rather time-consuming. But Sequential have thought of even this, as the 2000 can be switched to operate on twice the normal MIDI transmission rate. For the time being, this facility is only usable in conjunction with another Prophet 2000 switched to the faster rate, but as Sequential say in the manual: 'we fully expect future models from other manufacturers to have this double speed ability'. If double-speed still isn't fast enough for you, the 2000 can also be switched by remote command from a computer, to transmit and receive at three or even four times the standard MIDI rate. That should set the cables smoking.

At the June NAMM show in New Orleans, the American MMA (MIDI Manufacturers' Association) decided on a data format for sample transmission via MIDI. The 2000 is the first synth which implements this format, allowing you to send a recorded sample from one 2000 to another down the MIDI cable. Not terribly useful, as you can always just load the same disk into both. But think of the other implications: with suitable software (currently in preparation and with us in the New Year), you'll be able to send a sample to a computer to edit or store it, and when E-mu and Ensoniq release software updates to include this data format, you'll be able to shunt samples around between machines without all that tedious mucking about with resampling. Of course, eight-bit machines will have to ignore the extra four bits the 12-bit 2000 has, and similarly, the 2000 won't have the last four bits available if the sample has come from an eight-bit machine. But get yourself a suitable modem, and you'll be able to send samples down the phone to your mates in California, Tokyo or New South Wales. Now there's what I call global sampling.

The only possible problem with all this is that

All these features enhance the flexibility and longevity of the 2000, which will still be holding meaningful conversations in years to come when other 1985 MIDI specs will seem like caveman's grunts rather than philosophical treatises.

Do I have any grumbles? Well, yes I do. The inclusion of an arpeggiator, however intelligent, does seem backward-looking, and contrasts with the forward-looking nature of the rest of the instrument. I know there are those of you out there who love them dearly, and you won't be disappointed in this one: it's as flexible as they come. But I can't help feeling that a sequencer, however rudimentary, would have been more in keeping with the times. True, there's an Assign mode that allows you to build up sequence-like strings of notes, but as there's no way to save these, the facility is of limited use unless you fancy the idea of programming your sequences in front of your audience.

Next, and more crucially in view of the flexibility of the 16 sample locations, the dynamic allocation of the eight voices, and the different analogue parameters which can be assigned to different maps, there is only one LFO. Effectively, this means that in multi-timbral applications of the 2000, only one sound can use vibrato or tremolo effects unless all sounds are to modulate at the same rate. In view of the fact that everyone's LFOs are software-generated these days, this amounts to criminal negligence. Let's hope the situation is remedied soon.

The last criticism is a purely subjective one. The entirely metal case, complete with DX-inspired membrane switches and pastel shades, is *hideous*. The E&MM shutter-man, in mid-photograph, was heard to liken its front panel, with its funny triangles and mis-matched colour scheme, to a *One Two Testing* front cover, and while I wouldn't go that far myself, I can see what he means.

Myself, I thought the old Prophets looked classy, so you can be sure that the minute mine arrives (I got my order in early), I'll be sawing up one of my parents' best coffee tables to make the traditional wooden Prophet end cheeks, which I shall then glue onto the 2000.

Well, that marks the end of my complaints, pitifully few in contrast to my overall wholehearted approval of the Sequential newcomer.

The Prophet 2000 is the most faithful sampling keyboard yet available this side of the Synclavier. Stick the sounds in, and back they come accurately and instantly. The combination of analogue and digital editing facilities makes them more flexible than those of any other machine. As well as rescuing many a bad sample, editing sounds Prophet-style can render good samples more expressive and inventive.

An internal operating system, a clear front panel layout, and an unrivalled MIDI specification avoid the principle drawbacks of the Mirage. My advice? Pay the extra money, throw away the factory disks, and start your own sample library. You won't regret it. ■

DATAFILE

Sequential Prophet 2000

Specification *12-bit analysis, 16K/31K/42K sampling rate; two × 128K sample space, splittable into 8 blocks each; frequency response 20kHz (3secs sample time at 42K); max sample time 8secs at 16K (frequency response 8kHz)*
Keyboard *5-octave (61-note C-to-C), velocity sensitive, weighted action*
Features *Built-in 3.5" floppy disk drive; 2-digit LED display; 12 Presets, six waveforms in ROM; two Loops (Sustain and Release); combine/append/reverse/layering of samples; analogue filter, two ADSRs, LFO; velocity control of timbre/volume/sample start; Arpeggiator (Mode, Number of Octaves, Repeats per Key, Rate, Transpose, Splitpoint); keyboard split/layering/crossfades; comprehensive MIDI spec, sample transmission via MIDI, user-variable MIDI baud rate*
Interfacing *Right/Mono, Left/Phones jack sockets; Sample Input (jack socket), Mic/Line selector; MIDI In, Out, Out/Thru DIN sockets; Alternate Release and Aux footswitch jack sockets*
Price *RRP £1,995 including VAT*
More from *Sequential, PO Box 16, 3640 Mijdrecht, The Netherlands.*

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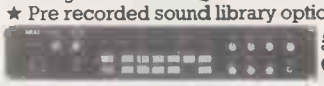

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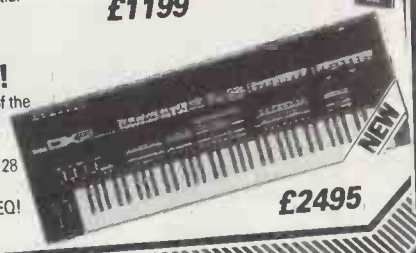

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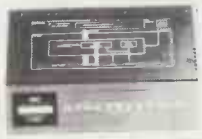

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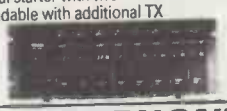

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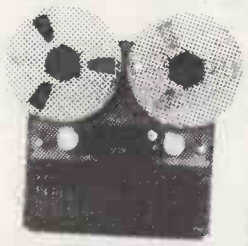

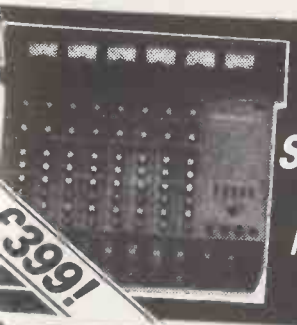

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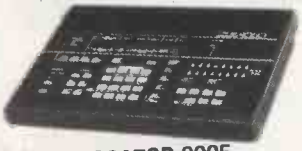

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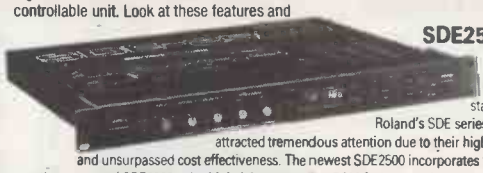

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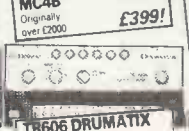

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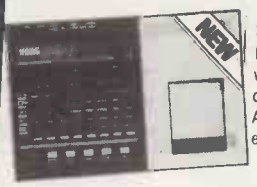

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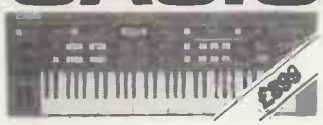

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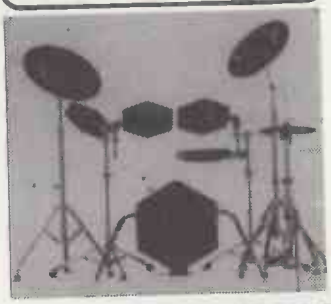

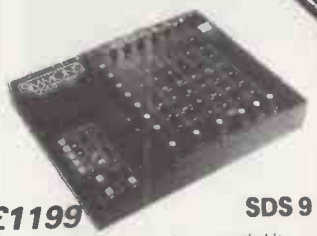

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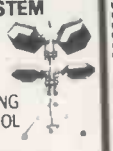

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Stockhausen sees the Light...

We take a brief look at the career of avant garde music's most influential figure – and report on a performance of his latest creation, "Donnerstag Aus Licht", at the Royal Opera House, Covent Garden. Words *Annabel Scott* Photographs *Clive Barda*

One of the most spectacular concerts ever seen on an English stage. That's the reaction from someone who went to Covent Garden with very mixed feelings about the UK première season of Karlheinz Stockhausen's latest epic electronic opera – and it's no exaggeration.

A few facts. After a classical music education in Cologne, Stockhausen composed several *musique concrète* pieces such as 'Etude', and his first two purely electronic pieces using sinewave oscillators were 'Elektronische Studien I and II', composed in 1953/4.

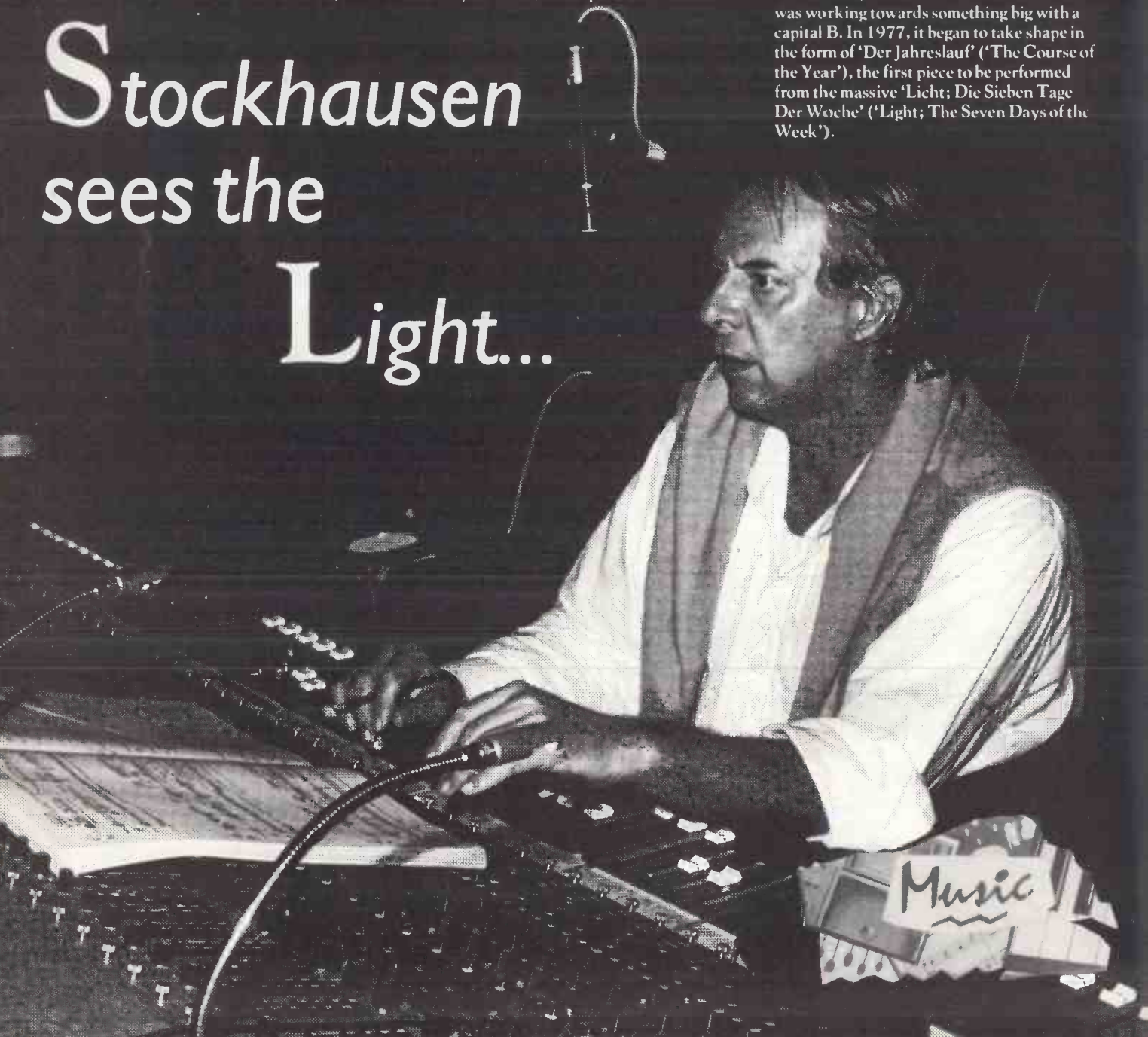
His best-known piece is probably 'Kontakte', which explores the points of contact between known and unknown sounds, the acoustic and the electronic. The piece's arrangement allows Stockhausen to play astonishing tricks with time and space. At one point, a high-pitched note whizzes down through the audio spectrum, dropping to sub-audio levels and turning into a slow, repeated clonk. In Stockhausen's music, pitch is interchangeable with time, and stereo placement is interchangeable with space.

The German's obsession with time persists to the present day, and some of his musical relationships take place over massive intervals. In fact, many of the facts and figures associated with his music are every bit as astonishing as the music itself.

By 1964, he was composing pieces such as 'Mixtur' for five simultaneous orchestras and six years later, the Expo '70 World Fair saw his music performed for five-and-a-half hours per day for 183 days, by a group of 20 musicians for over a million listeners.

In 1975 he composed 'Tierkreis' ('Zodiac'), twelve 'melodies on the star signs' in versions for high soprano, soprano, alto, tenor, baritone and bass voice, with chord instrument, chamber orchestra, clarinet and piano. Then came the massive 'Sirius' for orchestra, musicians, singers and synthesiser tape.

Gradually, it became clear Stockhousen was working towards something big with a capital B. In 1977, it began to take shape in the form of 'Der Jahreslauf' ('The Course of the Year'), the first piece to be performed from the massive 'Licht; Die Sieben Tage Der Woche' ('Light; The Seven Days of the Week').



What we have in 'Donnerstag' is the first full 'day' of an eventual total of seven. Composing one 'day' every four or five years, Stockhausen aims to finish the work around 2006. Asked if he is confident of being able to finish 'Licht', he replies: 'Why not? I will still be in an early part of my life then, I will only be 75 years old.'

Of late, Stockhausen's more outrageous claims have maintained for him an international reputation which eclipses that gained in his native Germany. Not unnaturally, he feels the German music establishment is dominated by conservative forces still opposed to experimental music. And it's understandable that Stockhausen's occasional claims to be controlled by intelligences from Sirius while he's composing don't go down too well.

Even taking all this into account, it would have been difficult to anticipate just how 'Donnerstag' would turn out to be on the London stage. Hackneyed it may be, but the term 'cosmic' is the only way I can describe the surrealistic majesty of Stockhausen's production.

It takes as its subject matter the early life of Michael, the Creator-Angel of the local Universe of which Earth is a part, and his subsequent journey round the world and return to Heaven.

Although the opera is in three Acts, there's also a 'Greeting' performed by brass players in the theatre foyer as the audience are entering, with a corresponding 'Farewell' after the show. More musically-trained members of the audience no doubt spotted portions of recurring themes in both these snippets, but as usual, the niceties of Stockhausen's radical 12-tone composition got past most of us.

Entering the main hall, I was a little surprised to find Stockhausen himself supervising the 'sound projection' from the centre of the auditorium.

You want some idea of scale? Well, the Royal Opera House generally uses a 24-channel Neve mixer, but this was only sufficient for the orchestra on the night in question, so the composer added a 36-channel Cadac to cope with the solo performers and backing tapes.

With the Neve acting as a pre-mixer under the ROH sound department's head, Eric Pressley, Stockhausen opened Act 1 by mixing in an eight-track tape playing an 'invisible choir' of male and female voices from the House's under-stage sound room.

Twenty-two ElectroVoice speakers were used for sound projection, two at either side of the stage and two 'flown' above it, with the other 16 dotted around the balcony stalls.

The concert's consistently outstanding sound quality was largely thanks to radio mics worn by the singers and instrumentalists, and over 40 other mics in the orchestra pit, on the stage, and on the side stages used for some of the larger instruments such as the giant tam-tam (gong).

What else is there to talk about? Ah yes, the plot.

Act 1 opens with a huge backdrop depicting a brick wall, used to back-project various shadow displays as Michael acts out his early life. Each of the main characters is represented by three performers — a singer, a dancer and a musician — and their interactions are backed up by a set of music-related gestures developed by Stockhausen for the piece 'Inori'.

The speakers have an especially large part to play in Act 2, which adds a 28-piece orchestra and, like I say, one of the most spectacular sets used on an English operatic stage. A huge globe of scaffolding, some 25-feet across, holds the figure of Michael as he ▷

prepares for his journey around the world. This begins with a lurch as the globe starts to rotate around the stage, stopping at seven points symbolising Germany, New York, Japan, Bali, India, Central Africa and Jerusalem – a suggestively autobiographical catalogue of a few of Stockhausen's major influences.

Then the globe halts, rotates backwards, and finally comes to rest at the end of Michael's journey. He plays the triple formula of the 'Michael theme' before preparing for his return home.

All credit for Act 3 must go to Lighting Designer Chris Ellis. In the face of almost impossible odds, what he achieved was quite unexpected, utterly spectacular, and no doubt something of a shock to seasoned theatre-goers accustomed to *The Barber Of Seville* and *Swan Lake*.

Act 3 is set in Heaven – Stockhausen doesn't mess about with his settings – and throws in absolutely everything, including an eight-track invisible choir tape, a two-track tape of snippets from earlier scenes, 11 soloists, a 61-piece orchestra, and five choral groups on stage dressed in metallic space suits. A huge circular stage section is the centre of the action, but after the opening solos, this stands empty before starting to tilt upwards, in total silence, towards the audience.

Standing under the Mothership in *Close Encounters* must have been something like this. The theatre fills with smoke, hails of silver confetti fall, and a huge rainbow of light dominates the stage, and the stage section, now pointing directly at the audience, starts to glow with a hundred multi-coloured flashing arc lights.

And before the audience can regain normal vision, the centre stage section explodes with the brightness of a dozen white arc lights in a cell-like pattern, and the stage begins to fall back into place.

Gary Numan would have turned green with envy – though the music continued to baffle anyone who didn't have the benefit of the extensive libretto or a smattering of German. Michael's battle with the Devil was lost on many, but Stockhausen has both clear and complex theories on the relationships between music, energy, life and harmony, of which this battle is just a tiny part.

Drawing conclusions about a four-hour piece that comprises only one-seventh of a finished work is a dangerous thing. But it's fair to say 'Donnerstag' is a magnificent musical and theatrical achievement, even though it can be few people's idea of an easy night out.

Unlike Philip Glass, Stockhausen designs his own sets, choreography and gestures, and even when these appear simple, they're usually the outcome of complex spatial and numeric relationships. His music is still less than accessible, though the composer's daughter, Majella, does hint at jazz piano phrasings in the 'Examination' section of the first Act, and Suzanne Stephens (as the glamorous Moon-Eve) wrings some incredible textures from the Basset Horn, an unusual and demanding instrument.

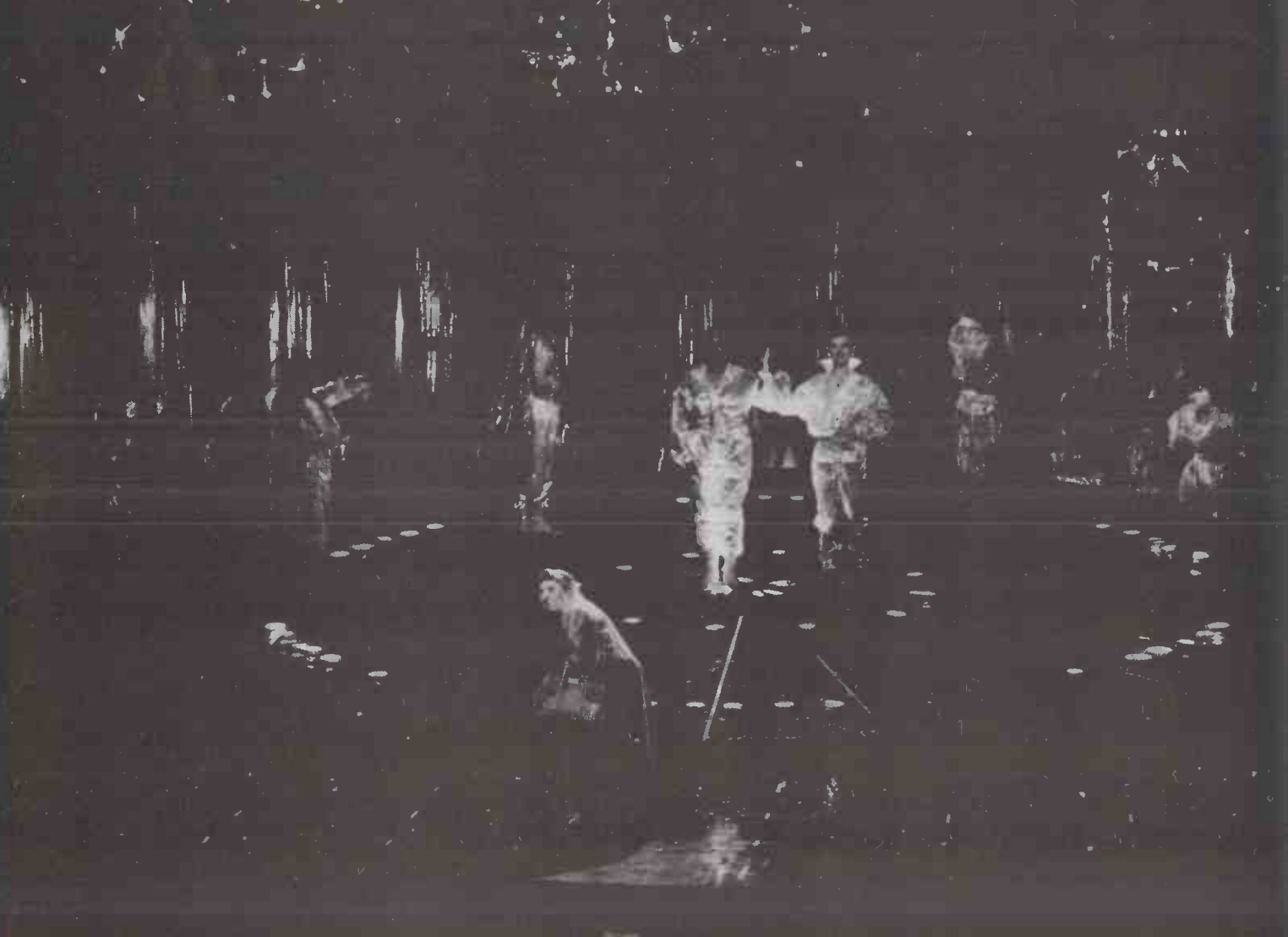
Whether the whole of 'Light' will ever be performed is open to question; it'll be about 24 hours long when it's finished. But if the staging is anything like the Covent Garden production, I'd recommend seeing even the smallest part of the piece.

'Samstag' ('Saturday') is now finished, and uses one solo voice, ten solo instrumentalists, a stilt dancer, a solo dancer, a male chorus with electric organ, a symphonic band, a 26-piece brass orchestra – and two percussionists for the Greeting. 'Montag' ('Monday') is already under way, and there's no reason to suppose that it's any less spectacular.

I sometimes find myself wishing Stockhausen played up the electronic parts of his composition. His sons Michael and Simon, who both have parts in 'Donnerstag', accompanied their father in some recent Barbican concerts on Moog and Oberheim synthesisers, and both have been involved with electronics in jazz and rock bands.

But Stockhausen is classically-trained, can't afford a Fairlight (though he says he'd like one), and will continue to use electronics on an approximately equal footing with conventional instruments, sound-processing, tape collage, the human voice, choreography, mime, gesture, symbolism, surrealism, mysticism, and all the rest of it.

He's a compulsive innovator who works without compromise. Most of his audience can only sit and wonder. ■



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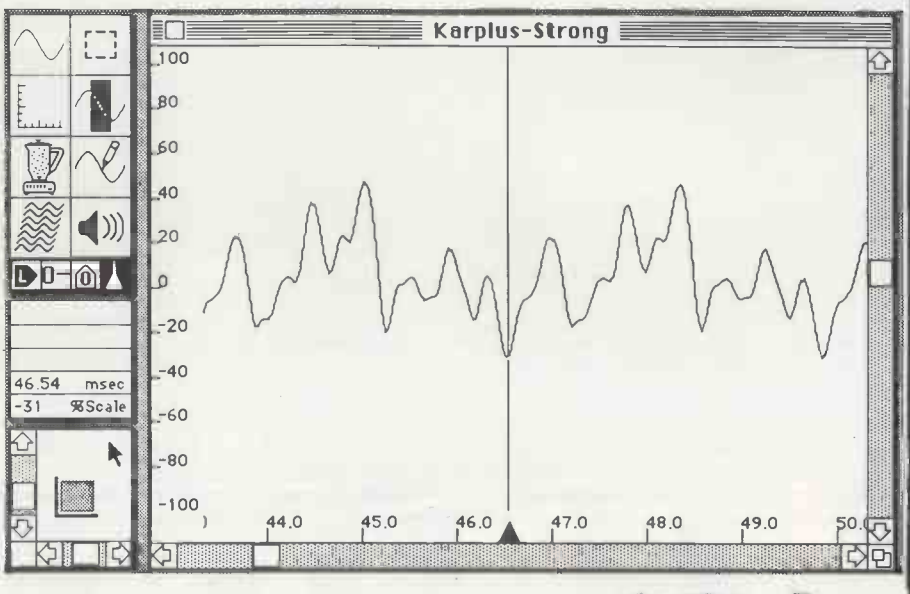
From California comes a sound-editing package for the Emulator II and Apple Macintosh that gives on-screen access to samples and their composition. It works a treat, and there's plenty more innovation to come. *Paul Wiffen*

SCREEN TEST

For some years now, we've all been hearing about the wonderful advantages of working with computer music systems. Superstar producers (need we name names?) use them to pull apart musical performances, fine-tune every sonic element, and then stick the spruced-up version back together again. Superstar performers use them to write, arrange and perform their music, sometimes to the exclusion of all other musical instruments. And Superstar programmers are in more demand than either of them, as it becomes their job to transform mediocre performers and producers into great ones. In fact, there's now only one thing preventing you and I from jumping on the gravy train: lack of Superstar money.

But now, from the people who brought you kick-in-the-teeth drum sounds at man-in-the-street prices, comes a computer music system that costs considerably less than a country house, instead of considerably more. Sound Designer is a software package for the Apple Macintosh that works in conjunction with that deservedly popular sampling machine, the Emulator II. In California, where all three are produced, you can assemble the system for around $11,000. Unfortunately, high distributor prices will probably make this something like £13,000 in the UK. Expensive, but still a bargain when you consider the astronomical sums you'd have to pay for such features on established systems like the Fairlight and Synclavier.

But whereas the big systems have sequencing software and a whole host of other goodies either built into them as standard or offered as optional extras, Sound Designer sticks to the editing, manipulation, and creation of sampled and synthesised sounds. It's an *editing* package first and foremost, though future updates and innovations on Digidesign's part (see later) will take it into further-flung territories. (The company is also planning a comprehensive EII-based MIDI sequencing package – see *Newsdesk* for details.)



Sound file window *with scales and screen cursor, shows Sound Designer's excellent definition and accuracy. Visual menu in top left includes 'food mixer' symbol for Mix option.*

To use Sound Designer, you need a recent-model Emulator II with RS422 port fitted (earlier ones had an RS232, but can be upgraded). Then, apart from an Apple Mac, Digidesign supply you with all you need to get the system up and running, for a British RRP of £895. This gives you the small amount of hardware you need, a cable to connect your EII with your Mac, and disks containing both ▷

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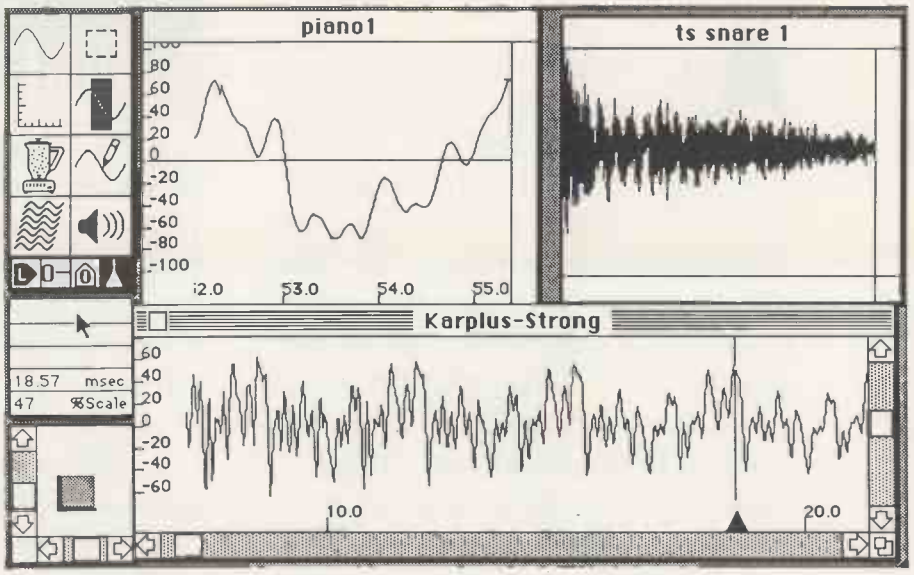


Multiple windows *pose the software no problems. You can look at three entirely different sounds at any one time, and their displays can be of any configuration.*

operating software and examples of its use. You also receive some exemplary documentation of the user guide variety, but thanks to the splendid icon/mouse system which the Mac uses, this is for the most part hardly necessary.

The mouse system allows you to whizz around the screen much faster than even the most experienced cursor operator, which makes the system much easier to jump about in, and therefore much more flexible. And most of the time, you don't need to consult the manual or remember masses of commands, as all your options are represented pictorially on-screen.

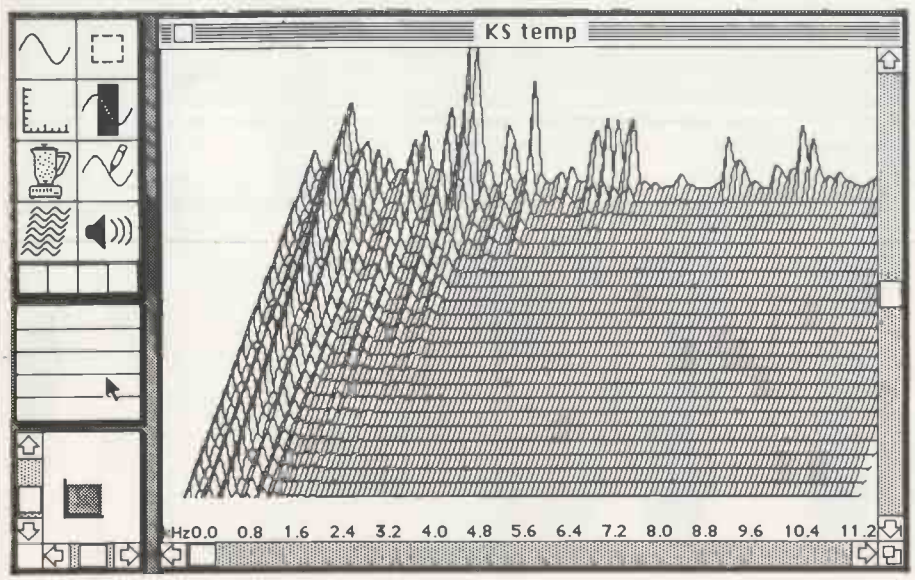
But a speedy method of operation would make not one jot of difference if every time you made a choice, the system had to go away and think about it for five minutes. Fortunately, this is not a problem with Sound Designer. Rarely do you see the little watch icon (which denotes 'Please Wait' in the Mac's language) when you're moving around in the various areas of the software. The only appreciable interval you have to wait comes when you're sending files (sounds) backwards and forwards between Mac and EII. In other words, when you actually want to hear something you've created – which you can still do only from the Emulator – you have to wait a little while for the sound to be transferred across. Fortunately, the data transfer rate is 500,000 bits per second, which is almost 17 times faster than MIDI, and keeps delays to a minimum.

More importantly, Digidesign's software writers have avoided the pitfall which the programmers behind Yamaha's QX1 operating system obviously fell straight into. Experience with any music system soon tells you that only a small percentage of what you create is actually worth keeping. Yet the QX1 dutifully saves everything you do, no matter how dreadful it is, which you then have to listen back to before you can clear the memory and try again.

On the other hand, the Sound Designer software incorporates a Preview feature, which allows you to audibly 'vet' any changes made before you go through the tedious process of saving to disk. So you can spot any blunders or inappropriate edits *before* permanent copies are made.

The Preview transfer takes place in as good as real time: a 1.5-second sample takes 1.5 seconds to be transferred. When you're satisfied that the changes you've made are for the best, you can call up a second transfer mode which automatically saves the new sound to disk on the Mac.

Saving library sounds on the Macintosh (instead of EII library disks) turns out to be a good move, as the delightful Mac filing system



Fast Fourier Transforms *(FFT for short) is what software calls harmonic analysis of waveforms. These will be user-editable when Sound Designer Version 2.0 arrives later this year.*

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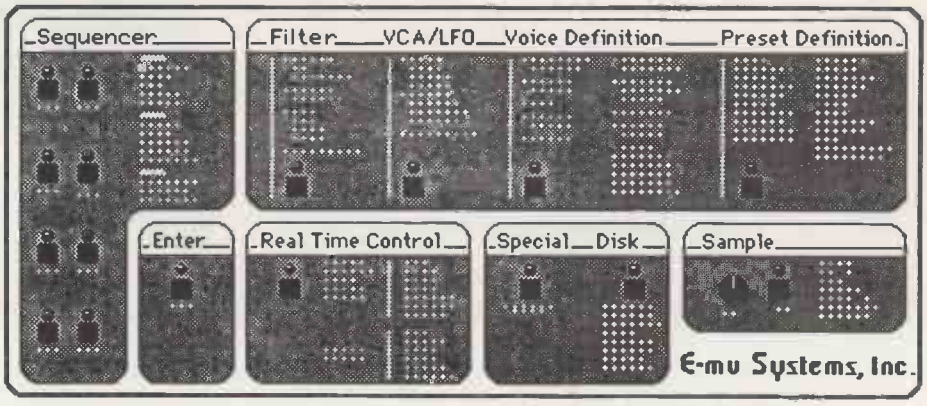

Computer interpretation *of Emulator II front panel is functional as well as pretty. Each section has its own programming screen, selected from this graphic using Apple Mac mouse.*

makes it much easier to find sounds and group them together in the combinations you need when building up sequences (locating all the sounds you need across 30 EII library disks can be a *real* pain).

As soon as a sound has made the initial journey from EII (where all sampling still takes place) to Mac, you can see what it looks like using a sound file window. If you need the zero energy line (x-axis for all you Cartesians out there), then moving the arrow to the O-line box sets the centre line to On. The vertical cursor (or y-axis) can be 'dragged' back and forth, or you can scroll (very smoothly) through the waveform. Scaling can be altered (and is shown side and bottom) so that both time and amplitude can be expanded or contracted to give the most informative picture.

What all this adds up to is the most flexible editing display format I've ever seen. Instead of having to choose the display that's nearest, you can tailor the display to fit the length and amplitude of the sound you're working with, or any part of that sound.

And if you want to examine a small portion of the waveform more closely, you can avail yourself of a zoom box. All you do is use the mouse to enclose the section that's of interest, and release the button to 'blow up' that area until it fills the screen – extremely useful for fine-tailoring samples.

The position of the cursor on-screen is translated into an accurate time reading (to 1/100 of a millisecond) along with the percentage amplitude at that point; and this data is given in the control column on the left of the screen.

You can call up a picture of the entire sound file using an Overview window, and then, having moved the cursor to a new location, find the waveform at that location displayed as soon as you return to the main window. You can also place as many as 10 markers (again by 'dragging'), either to allow quick movement between various points in the sound, or to mark points of interest.

Far and away the most useful markers are the ones provided for looping. These too offer time and amplitude readouts, and also allow you to place loops sample by sample, and match amplitudes exactly for the smoothest possible loops known to man, undetectable because you can observe the pattern of samples so closely and take them into account. So, no more endless fiddling with unknown sample quantities trying to lose that unwanted hiccup, and no more trying to find that previous good loop after the Auto-loop feature lost it for you. Sound Designer loops are quick and (providing you match loop points properly) undetectable.

But this is just the beginning. You can in fact have up to three sound file windows on display at once, and splice between them to your heart's content. This is done using another of the Mac's splendid graphics features, Cut and Paste. With the help of a Waveform Clipboard Window (which holds a 'snipped-out' segment of a sample file), you can experiment with inserting segments of one sound into another, making digital splices, or even the compilation of entire 17-second sound collages. Great fun.

However, if the idea of splicing seems a little unsubtle to you (sudden changes jarring on the old ears and all that), then Sound Designer offers two more refined techniques through its Digital Mixer pages.

First, Mix allows any two waveforms to be combined in any proportion. This proportion is then computed, and the result scaled in the interests of avoiding clipping. You can also specify the phase relationship between the two samples, using an offset accurate to individual samples.

Simple mixing not up your street? Then go for the more complex Merge option, which allows you to crossfade between two different samples. This is done simply by placing markers at the points in each sample from which you want merging to begin. You then specify the speed with which one sound becomes the other, either as a number of samples or as a time.

This is where the real fun starts. Imagine tacking percussive attacks onto the front of string sounds, or sticking a bit of thunderclap in with a snare. Just a thought, you understand...

Future versions of Sound Designer will expand the digital mixer section to encompass digital equalisation, compression, and gain changing/normalising as well as other goodies yet to be finalised. Each update will cost a nominal charge of somewhere between $50 and $100, and it sounds to me like the upgrades will be well worth that outlay.

But still the list of facilities is not complete. For Sound Designer is the first piece of software since the Fairlight's which allows you to draw waveforms on-screen. The mouse is ideal for this function as it's more accurate than a light pen, and using it, you can either modify existing samples or completely redraw waveforms. This means you can actually create new sounds from scratch, though the process can get a bit long-winded.

Still, if it's completely new sounds you want, Sound Designer supplies you with a faster, more convenient method of obtaining them. The system employs a digital synthesis technique known as Karplus-Strong (after its inventors, a couple of boffins from Stanford). It's an algorithm that allows you to create plucked sounds very quickly – though for other things it's rather limited.
perform FM on it with operators. I can't wait.

But back to current options. 'Fast Fourier Transform' is mathematicians' jargonese for the harmonic analysis of waveforms. And in the course of an EII/Digidesign Sound File, just such an analysis is made every 10 milliseconds. This is then displayed in a unique three-dimensional format, which shows the way harmonics levels vary during the course of a sound. This doesn't just give the prettiest landscape pictures since the Fairlight's Page D;

However, raw synthesis is one area of Sound Designer where major expansion is on its way. Version 2.0 (due towards the end of the year) will contain not just an FM package, but also an interesting-sounding variant of it which the designers call waveshaping. Instead of pratting about with sine waves (which take an awful lot of mucking about with before they start to sound interesting), the system will enable you to use a sample as a carrier and it's actually more useful. You can spot unwanted overtones in a sound, or use it to locate suitable points for looping the sound.

In Version 2.0, this FFT surface will be editable, allowing any frequencies to be boosted or attenuated at will at any point in the sound. Just like a programmable real-time equaliser, only more versatile. This screen will also form the basis of a resynthesis program, allowing the recreation of the harmonic profiles in a sample. But resynthesis programs are only as useful as the result they give – so we can't judge this one till we hear it.

Still, the fact of the matter is that some of sampling's most persistent and damaging problems – speeding up and slowing down of envelopes, aliasing on lower notes, shifting of events in the sample, and so on – can only really be overcome by converting sampled data back into the more generally-applicable forms of envelopes and harmonic profiles.

Using a rather cute reduction of the Emulator's front panel, you can choose which module you want to activate. Each has its own screen, and all functions can be inspected, changed and re-stored. The most useful of these is the keyboard set-up screen, which shows where all the samples are located, as well as crossfades and velocity switches.

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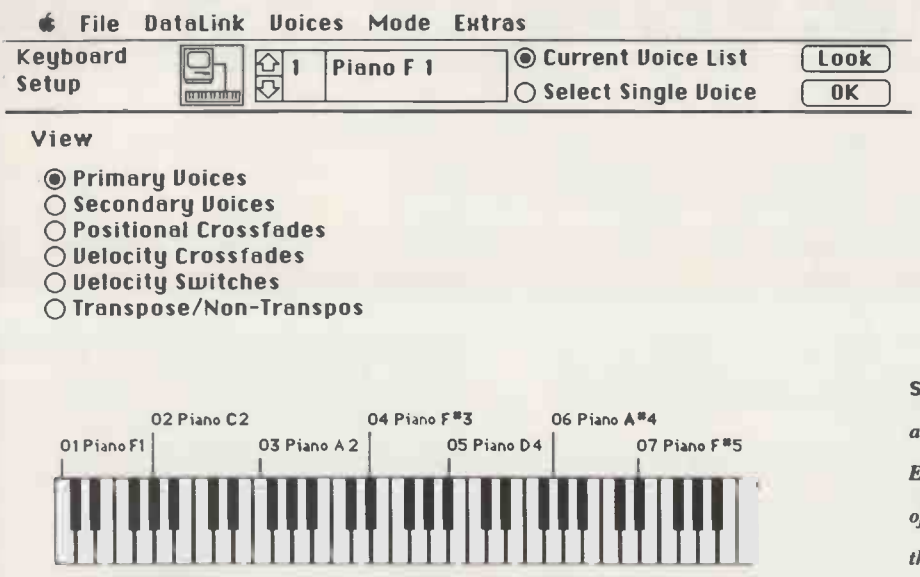

Special programming screen *is used for adjusting keyboard setup information. Emulator II excels at providing user with plenty of performance options, Sound Designer makes them more accessible.*

Thanks to Digidesign's ingenuity, EII owners are no longer restricted to sounds they can get a microphone in front of. Now they can start making their own sounds from scratch, too.

Whilst some of the system's most revolutionary features are still a little way off, there's no doubt that the Sound Designer software already vastly expands the programmability and flexibility of an instrument which has always sounded great, but has until now been hampered by the lack of on-screen programming.

But above and beyond everything else, it's the looping which justifies the outlay on this package all by itself. Being able to see the exact points at which a loop starts and finishes gives you unprecedented accuracy in looping the most awkward sounds – and if you do things properly, nobody will hear the join.

Actually, 'ingenious' is just one word you can justifiably apply to the way Sound Designer has been put together. 'Revolutionary' is another. ■

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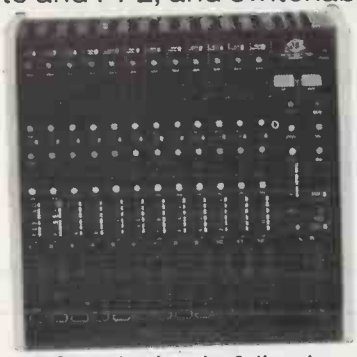

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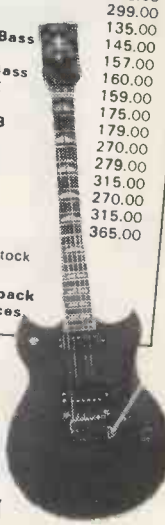

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Birth of a Studio

CTS Studios, home of the world's first Neve DSP digital mixing console and scene of more orchestral recordings than almost anywhere, has just added a hi-tech music facility to its recording armoury. We take a trip to Studio 4. Words *Simon Trask* Pictures *Matthew Vosburgh*

Wembley Stadium complex, second home of East European gymnasts (at the Arena), hordes of Japanese businessmen (the Conference Centre) and Scottish football hooligans (the Stadium itself), has just given birth to an extraordinary keyboard-based recording studio.

The studio is far from ordinary for several reasons. First, because its owners have equipped it with a vast, bewildering array of technology right from the word go, rather than accumulating gadgets bit by bit. Second, because it is only a small part of a much larger studio complex, long-established and currently boasting such niceties as a Neve DSP all-digital mixing desk and a main studio floor capable of holding 130 musicians. And third, because the extraordinary present has an equally extraordinary past behind it.

Stay in your seat, keep the magazine in your hands, and all will be revealed.

For 25 years, a recording complex known as The Music Centre has been in operation next to the East European gymnasts, the Japanese businessmen, and the Scottish football hooligans. In 1985, we find that complex operating under the fairly anonymous title of CTS. Along with Abbey Road and Sarm, it's one of the best-known studio outfits in London, and as such, it's played host to huge numbers of rich and famous music people. Why, only last year that Neve DSP and 130-capacity floor were being used to record the soundtrack to the James Bond movie, 'A View to a Kill', Duran, Grace Jones an' all.

Strangely, it's in film music (or more precisely, the use of synthesisers in film music) that the origins of the new keyboard studio lie. In fact, since the inception of Studio 4 (so-called because it's the fourth at CTS, obvious really) in mid-September of this year, film work has been its staple diet.

Studio 4 is linked by tie lines to the other studios in the complex, and can be used in conjunction with Studio 1 for simultaneous keyboard/orchestral recording (there is also a video link between the two), in which case Studio 4's desk can function as a sub-mixer to the DSP desk in Studio 1. However, the studio is perfectly capable of operating in its own right, and is by no means limited to film work.

Our tale begins with one Brian Gascoigne, a composer and keyboard player who's worked in film music for many years in both capacities. His background includes study at the Berklee School of Music in Boston and a three-year stint with brilliant Japanese percussionist Stomu Yamashta. In those heady days, Gascoigne's keyboard setup comprised the evergreen Fender Rhodes, an ARP 2600 ('a very fine machine'), an ARP Odyssey, a Hammond B3 organ and the quintessential grand piano.

An invitation to write music for a sci-fi film called 'Phase 4', which called for exclusively electronic music, resulted in Gascoigne searching for a studio that specialised in synth facilities. At that time there were only two in London: Electrophon, run by Brian Hodgson (now head of the BBC Radiophonic Workshop – see E&MM October '85), and Kaleidophon, which was (still is) run by David Vorhaus. Gascoigne ended up at the latter, and subsequently became a partner with Vorhaus for about 10 years.

Vorhaus is a maverick genius who built his own studio from scratch, with a 24-channel mixing desk and an improvising sequencer called Maniac, which actually creates sequences according to the sets of probabilities you feed into it. That studio's first polyphonic synth was a Prophet 5, but Gascoigne and Vorhaus were keen ▷

followers of hi-tech studio chic, and found it hard to ignore the Fairlight CMI. Thus, Kaleidophon acquired the first Fairlight in the UK when Vorhaus visited the '78 Frankfurt show where the instrument made its first appearance, befriended Fairlight's Peter Vogel, and ended up making room for the superpower instrument prior to Fairlight finding a British distributor. The studio subsequently bought the CMI 'on very favourable terms', and Gascoigne now considers its use second nature.

During the ensuing years, Gascoigne started getting work as a synth player on orchestral sessions – which often meant working in CTS' Studio 1. A lot of his work was for films, like the 'Star Wars' trilogy, the 'Superman' threesome and 'The French Lieutenant's Woman'.

Playing synth in duet with a full orchestra is never all sweetness and light, though, as Gascoigne reveals.

'First of all you have to set up all your equipment – which these days can be quite a lot – by 10 o'clock. The orchestra comes in, and you may have about 10 minutes with the composer to run through a few sounds. You then work at orchestral speed: you sight-read through the music, a couple of quick alterations are made, and then you record it. But of course, on the read-through you're assembling your sounds, making sure they're alright and that they fit with the orchestration. So by the time the orchestra's ready to record, you're ready to start sight-reading. And it can get incredibly hairy, because you can't get up in front of 120-odd people and say 'sorry, I'm not ready' when there's megabucks going down.

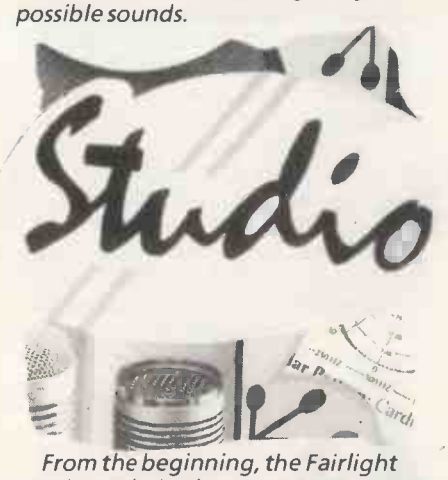
'So you have to scuttle through it. Sometimes you can sneak back into the control room afterwards and ask to put your track down again, but it's considered rather bad form.'

It was while working on the soundtrack to 'The Emerald Forest' (Martin Boorman's much-delayed West-meets-Amazon Jungle epic) that Gascoigne conceived the idea of a keyboard-based studio. His ideal was a facility for producing the synthesiser portions of orchestral filmscores, either before, after or even during the orchestral recording. And if you equipped a studio with that in mind, there was no reason why it couldn't be used for purely electronic filmscores, and for TV work, jingles and more run-of-the-mill musical things.

CTS didn't take much persuading before they responded enthusiastically to his proposals. The need was obvious, and the room was already available at Wembley.

The upshot of all this was that CTS provided the studio space, the desk, the outboard gear, the tape decks, the engineers and the overheads. Gascoigne's job was to supply the keyboards.

At the time he had a half-share in Kaleidophon's Fairlight, which he sold in order to buy a new one, complete with MIDI and SMPTE cards. He also had a Prophet 5, an Oberheim OB8, a Yamaha DX7 and some outboard gear – all of which have since found their way into the studio. A TX816 rack has since furthered the Yamaha FM contribution to Studio 4's gallery of possible sounds.



From the beginning, the Fairlight was intended to be an optional extra. That meant finding another sequencer (ie. something other than Page R) to control all the keyboards. There was also a pressing need for some kind of drum machine. Cue the Linn 9000, an impulse buy as it arrived at Syco on the very day Gascoigne was buying his Fairlight. The 9000 has since caused a few problems, but these have apparently been solved, and Gascoigne now feels it's 'a brilliant machine, very quick and intelligently designed.'

Kaleidophon had owned a PPG Wave 2.2, so it seemed a natural progression to equip Studio 4 with a Wave 2.3. Gascoigne considers the Wave to be infuriatingly designed, but he values it highly for its ability to sound strongly 'analogue' in spite of its digital origins. The studio's Matrix 12 came in conjunction with the Wave 2.3 as part of 'an offer I couldn't refuse' from Turnkey – though having owned an OB8 for some time and used an Xpander previously, Gascoigne was quick to appreciate the 12's potential.

A Prophet T8 was bought with a view to making it available as a master keyboard, but disposed of not long after when it turned out to be, in Gascoigne's words, 'the most desperate piece of junk'. The touch of the keyboard was wonderful, but the synth section proved to be not a patch (ouch!) on the Prophet 5's, and the velocity data conveyed over MIDI bore little resemblance to what was happening to the keyboard.

Most studio people would be happy with a line-up of equipment like the one I've just described, but not so Gascoigne's backers at CTS. Their first reaction when he presented his list of goodies was: 'Where's the Synclavier?' I guess there's just no pleasing some people.

In fact, there is a Synclavier currently resident in Studio 4. It belongs to film music composer Trevor Jones, who was putting the finishing touches to the soundtrack to a new film titled 'Runaway Train' when your reporter visited CTS. For a particularly emotive moment in the film (which is more serious than its Disneyesque title might suggest), Jones has used the slow second movement from Vivaldi's 'Gloria', synthesised on the Synclavier using string and vocal sounds. The resulting unearthly stillness is closely suited to the moment, in a way that an 'authentic' performance could not have managed.

Seeing as Jones is an enthusiastic advocate of using the Synclavier, Fairlight and so on in film music, it isn't surprising to learn that he was among the first to recognise the value of Studio 4 to the film composer. The facility allows music to be sequenced extensively before it's so much as put down on tape. This means film composers can show their ideas to directors and make changes without having to go to the trouble (and cost) of re-recording everything. And this holds good for orchestral scores, too, where as much as possible can be sorted out in a synthetic version before any expensive orchestral recording time has to be invested in.

Still, if the idea of a Fairlight and a Synclavier sitting next to one another in Studio 4 sounds a bit excessive, Gascoigne is the first to agree.

'In a sense it's absurd, an insane waste of money. But people are bound to have used one or the other, they'll want the sound of one or the other, and they'll bring in floppies relating to one or the other... I can see no way around it, but I do rather resent the duplication. The same thing is true of the PPG Wave sequencer. In a studio such as ours we don't need it, because we can use one of the other sequencers to run the PPG's voices. But I suppose for another studio that might be their sequencer, and they'll be very happy to use it as such.'

Ah, the perils of having too much at your disposal...

Studio 4 is staffed by Tim Pennington and Martin Ley, as chief engineer and assistant respectively. Both were working at CTS prior to joining Studio 4, Pennington being something of a veteran with five years notched up, during which time he's worked in all the other studios, including a spell with the DSP in Studio 1. Ley, who was a lowly tape-op not so long ago but now doubles as an all-singing, all-dancing synth programmer, is something of an antique synth collector, with a bedroom full of early machines including two Moog Sources, a MicroMoog and a MemoryMoog.

Despite his crucial role in bringing

Studio 4 into being, Brian Gascoigne will be taking something of a back seat in its day-to-day running – though his experience will no doubt be called upon when required.

Unlike many Fairlight and Synclavier users, Gascoigne is fiercely critical of the idea of sampling to create perfect reconstructions of acoustic sounds. His own sympathies lie 'quite strongly' with the view of orchestral musicians that sampling in that form is in some way immoral.

'It's hypocritical that record companies should take people to court for copyright piracy and yet not think that they themselves are committing piracy when they use a sampled sound without the consent of the person who's played it', he says. 'There's definitely some room for more formal arrangements concerning ownership of samples.'

He's treading on dangerous ground, needless to say, but Gascoigne is far from being a paid-up member of the Luddite anti-sampling lobby. He's especially keen on the creative possibilities of manipulating samples, and of combining these with acoustic sounds.

As a direct result of this enthusiasm, the Studio 4 Fairlight isn't short of a sound or two. There are some 87 disks currently at the ready; even the Fairlight library disks have extra samples crammed onto them. Not surprisingly, many of these sounds come from Gascoigne's Kaleidophon days.

Studio 4 also has its own small isolation room, intended mainly for recording vocal and horn overdubs, whilst it's intended that a piano should take up residence there at some point, in much the same way as a Joanna found its way into Paradise Studios (see last month's E&MM). It seems acoustic instruments have a knack of sneaking in the back door of 'all-electronic' music centres.

But back in the world of contemporary technology, we find a complex MIDI-based 'network' which interconnects all the instruments in Studio 4. It's been put together with great care by Gascoigne and his accomplices, and the result of their endeavours is the most comprehensive MIDI network I've yet come across. There are two Syco MI4 boxes, a Quark MIDILink 999, and a custom-designed 10-in, 10-out MIDI patchbay.

It's a configuration that allows any piece of equipment access to any other, while insertion points allow for future updates, like a possible third stand of keyboards and the Synclavier when it receives its MIDI. Each of the two current stands has an MI4 allocated to it, and these connect to the Quark, which in turn connects to the custom bay.

Work involving films, ad jingles or pop promos sees Studio 4 make use of a Sony U-Matic video system, with the time-code burnt into the video picture and a time-code track on the tape, which is then recorded onto the studio's 24-track machine via a reshaper. The reshaper tidies up the signal, ensuring there are no drop-outs caused by generation loss. Once the time-code is on the multitrack, it can be read by the studio's Friend Chip SMPTE Reading Clock, which in turn can control MIDI sequencers and any pre-MIDI clock-based equipment. The SRC can cope with the 24, 25, 30 and 30 drop-frame implementations of the SMPTE standard, and allows up to 32 cue points to be entered 'on the fly'.

Each cue point can be given its own tempo (in absolute terms, this is expressed as the number of SMPTE frames per beat), and 'tables' can be set up for each cue point, to define which clocks are to be sent. In addition to the MIDI clock, the SRC can send clock pulses at any rate including the Fairlight's 384 ppqn – and it also allows cue points to be adjusted to a resolution of micro-seconds. Which gives you some idea of just how fine a degree of control a SMPTE-based system allows.

I've already mentioned the substantial amount of inter-linking between Studio 4 and the more established CTS facilities, but it's worth noting an operation using those facilities was to be attempted by composer Maurice Jarre (father of Jean-Michel). He expressed a desire to use Michael Boddicker, Ian Underwood and Brian Gascoigne playing multiple synths in Studio 4 simultaneously to the orchestra recording in Studio 1, but although this shouldn't have posed CTS any problems, the project ended up being done in Germany. Still, if you've just saved up enough pennies for that orchestral/synth concept album you've been planning all these years, CTS are ready and waiting for you.

Since its opening in September, Studio 4 has been used for a Channel 4 wildlife documentary, music for 'Holiday on Ice', and some jingle work (Tim Souster wearing his commercial hat), though most of the time has been taken up by the aforementioned 'Runaway Train' filmscore.

It'll be interesting to see how the studio fares, and whether or not it finds its niche purely in film or TV work.

Building up business is inevitably a slow process, so although the facility has been well publicised around the record companies, it's very much a matter of Studio 4 having to persuade companies out in their direction. As Pennington points out, record companies tend to have a set of favourite studios that they stick with for years, and old habits die hard. ■

DATAFILE

CTS Studio 4 Rates (excluding VAT)

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On Tap

If the local arts centre is fully booked, students' union entertainments have been cut back, and the drama school has stopped doing live music, you've got nowhere to play but pubs and clubs. We pinpoint the pitfalls and pleasures of playing in front of an inebriated audience. *Tim Goodyer*

So you've taken the big decision. You're going to get out of your bedroom, and play some of your music to an audience wider than your brother, the local scout troop and E&MM's DemoTakes page.

Let's take a look at a few of the problems that are inevitably facing you. Never mind all this 'sequencer or tape' stuff for the time being. It makes more sense to start with where you play.

There may be a cathedral in the vicinity whose stained-glass windows and long, winding reverb-times would compliment your more ambient pieces to good effect. Or you could consider the local Women's Institute, which continually plays host to a wide variety of events from tupperware parties to raffles in aid of leukemia research, and which would probably find a slot for a musical evening of some description. Then again, perhaps not.

Well that's it, then. You've exhausted all the possible options, and there's nothing else for it but to retire to the pub for the evening to sink a few beers, and discuss your impending fame and fortune with your Heavy Metal guitarist mate. But just a moment. What about the pub as a venue?

The idea is plainly silly. There's no stage, not enough space in the room the stage isn't in, no lighting, no three-phase mains, and no dressing room.

But do you really need a stage as such? Or, for that matter, anything more than the in-house lighting, a couple of 13-amp sockets, and the Ladies' to get made-up in? One thing's for certain: when it comes to situations in which space is at a premium, your drum machine/sequencer or tape deck is a hell of a lot smaller (and less frightening) to the publican than a live drummer and all his regalia will ever be.

Now we're making progress. Why should the pub gig remain the domain of the ageing organist and the HM band? Answer: no reason at all.

But things are rarely that simple. There are a whole load of factors to consider before you go into the first few bars of the song that's supposed to drag people away from the bar.

First of all, there's the choice of pub. A few simple guidelines here will help to reduce the amount of wasted journeys you make, and the number of bewildered landlords you meet.

Initially, you should approach venues already in the habit of playing host to live music. But don't rule out any that aren't; you may be just the man to rectify the situation. In either case, you're going to have to represent your intentions and your music as attractively as possible, so have a good idea of what you're going to need and why before making your approach – and be prepared to remain flexible. A cassette of your music should make communication between landlord and self a lot easier – it might even convince him you're not going to drive his custom away for good.

While you're at the watering hole in question, cast a wary eye over the clientele. Does it look like the sort of audience your music will appeal to? Remember that OAPs, for instance, are not recognised by Gallup as constituting a sizeable element of the electronic music fraternity.

There is another consideration: money. Now, I know many of you would be quite content merely with the chance to enrichen the world with your artistic genius. But given that you're unlikely to make much profit out of many pub/club gigs, you should at least try to ensure that your expenses are covered.

Unless you have access to some adequate amplification, or even a modest PA rig, you'll have to hire something. This costs money. Even if you have some suitable transport, you're going to need some petrol before it'll take you anywhere. If you don't have transport, you'll have to hire some. All this costs money, too.

There's no single approach guaranteed to make the landlord cough up either expenses or some sort of payment likely to land you in the black. The best advice I can offer is that, as a consumable commodity, free beer is a good barter.

7 *things to bear in mind when gigging in pubs and clubs*

compiled from experience by Dominic Stockler

1 TRY *to use up as little space as possible. Landlords prefer space to be taken up by the alcohol-buying public, and don't really give a tinker's cuss about the music so long as it brings the punters in.*

2 GAFFA *tape all leads down so that punters don't trip over them on their way to the toilet. Avoid obstructing toilets as this can make you very unpopular.*

3 DON'T *rely on one piece of equipment too heavily; try and have some sort of replacement on hand when one of your main instruments suddenly decides to take a holiday halfway through the set.*

4 SWITCH *off any jukeboxes that might be lurking in corners. They have an unpleasant habit of springing into life in the middle of quieter numbers.*

5 DON'T *try to be too avant garde. Unless the gig has been heavily advertised, most of the audience will be there to get drunk, find a mate, or whatever. That said, you'd be surprised how well a bit of musique concrète can go down if you get the balance right.*

6 REMEMBER *to treat every gig as though it was Madison Square Gardens. You never know quite who might be watching...*

7 WHEN *the glasses start flying – Get Out!*

You may have to settle for playing an evening early on in the week to begin with, as a consequence of landlordly reservation. Do not be deterred.

Right, gig secured. What next? In this respect, if in no other, your pub début is no different from the opening night of Duran's mammoth American tour, as preparation is the keyword for any gig, no matter what its scale.

To begin with, we'll take the material for granted since it's a pretty obvious point, and who am I to question your artistic credibility or musical merit? Let's turn our attention to other practical considerations, beginning with your situation within the licensed establishment that you are about to desecrate in the name of art.

On your arrival you will, in all probability, find that Herr Landlord has already chosen a site for your activities without recourse to you. Nine times out of ten, this site will be devoid of mains sockets, partially obscured from the remainder of the room by a conveniently situated pillar, and right next to the 'Crazy Kong' video-game machine. If you're able to locate El Gaffer (very likely), kick up a fuss in an attempt to get him to change his mind (very unlikely).

Whatever happens, you'll soon discover that decent mains extensions are essential if the evening is not to finish here. And do try to keep the cable out of harm's way (plugs come out as well as go in, sometimes with the assistance of the curious punter), because people who trip over it have a nasty habit of asking you to replace the pint of Euro-fizz they've just emptied on the floor.

It's unlikely that floor space will be in abundance, so use it wisely. This doesn't mean you can't use it imaginatively or entertainingly. There is documented evidence of people using slide projection and videotape accompaniment for this sort of performance, so there's no reason why you shouldn't consider doing something similar. You are calling it art, after all.

And so to the joint subject of equipment and personnel. It may be that your original intention was to use a traditional 'band' format to present your work (alternatively, you may be more of an electronic purist or simply an equipment fanatic, in which case the issue doesn't arise), but if space is limited, you may find your Portastudio or Akai 4000DS suddenly becoming an invaluable friend. Even if you're against the idea of being totally dependent on machines, a judicious pruning of the line-up can still be a great help – especially if it means the difference between playing that night and watching Joan Collins on 'Wogan'.

In the same way as drum machines obviate the need for a greasy know-nothing skin-basher, sequencers offer an attractive alternative to tape as a space-effective extra pair of hands.

One important consideration has so far escaped our attention: The Beer Factor. I know it hasn't been too far from your thoughts (it's certainly never too far from mine), but in the context of a pub gig, it has ramifications that at least equal those of location, material, equipment, and all the rest of it.

Surprised? Let me explain. Just as a sequencer can transport your gig from the realms of fantasy to reality, so beer is more than capable of bringing it back again. OK, so you do a bit of Kronenbourg now and again, but you can handle it...but can your precious MSQ700 or Portastudio? The sad truth is that not only can your equipment hold its beer better than you, it can also hold crisps, pork scratchings and cigarette ash better than you – all in the wrong places and all to devastating effect.

The arrival of digital access control has given us the instrument panel largely devoid of knobs and buttons, adorned instead with lots of pretty pictures and tables. Unfortunately, these tables present a very tempting alternative to those provided by the pub for the accommodation of your pint/ashtray/nuts. They also have a habit of not remaining upright when your attention is elsewhere. You have been warned.

And now the gig's over. How did it go?

Maybe it was fraught with technical problems and you swear you'll never venture into live performance again. Maybe you were as well appreciated as the Colorado Beetle is by the potato farmer. Maybe it was more successful than you ever dared hope.

Whatever the result, it was worthwhile. You can be sure that the next gig will belong to one of the other categories – they always do – but you're keeping music live and alive. You need no further justification. Buy yourself a drink. ■

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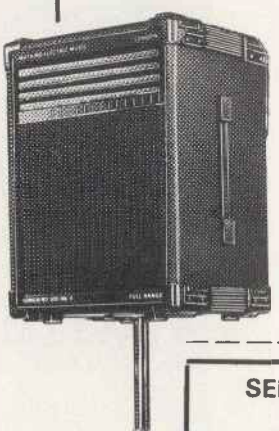

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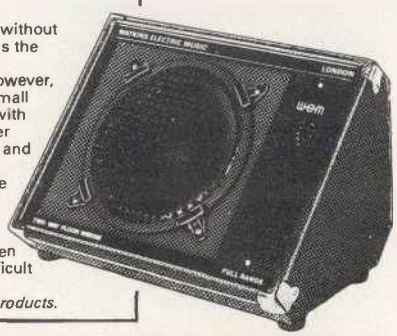

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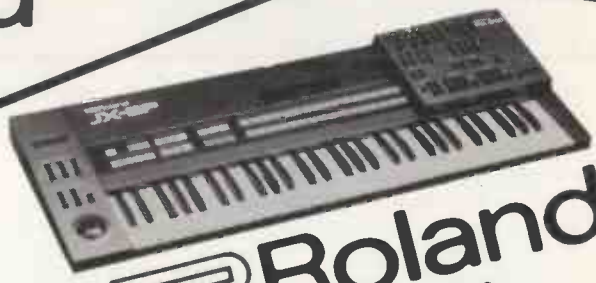

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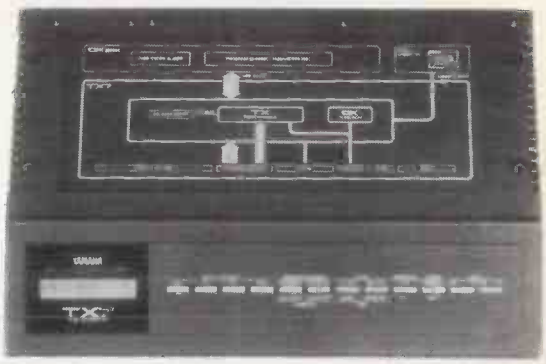

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HIT *and* MISS

Finally, Roland take the plunge into the electronic drum market, with an all-digital, MIDI-compatible kit you can buy in stages. But is it a case of too much, too little, too late? *Paul White*

Time, experience and a lot of all-expenses-paid curries have taught me at least one thing: if there's a marketable innovation in the hi-tech music field, it's never more than a matter of months before Roland start marketing a version of their own.

And the electronic drum market is the exception that proves the rule. For while Simmons and their imitators have been selling electro kits successfully for more than three years now, Roland have sat and waited, analysing the status quo and refining their designs. The result, just finding its way into UK shops as you read this, is the DDR30 and its associated pads; on the face of it, a pretty serious entry into the electronic percussion stakes.

The Roland version certainly looks the part, with pads that are both strikingly designed and well built, areas where many of the kit's would-be competitors fail. Like most electronic drum kits, the hardware is divided into two distinct areas: the parts you hit and the parts you twiddle. Let's start with the hitting bit first.

All the drum pads are identical in size and shape, with the exception of the bass drum, which is larger than the rest. It seems drummers like to retain some link with their acoustic ancestry, and having something to hide their legs behind presumably helps with their insecurity problems. And the increased size does make the bass assembly a more stable structure – it certainly seems solid enough.

Rare among electro-drum systems is the way the Roland is available in completely modular form. That means you can either buy a full six-piece kit, or build things up a pad at a time as and when finances allow. Thus we find both types of pads, the standard PD10 and the PD20 bass pad, plus the stands, all available separately from your friendly High Street music store.

Design *'The shape works practically as well as aesthetically – it's easy to fit a lot of tom-tom pads into a small space.'*

As for that truncated triangle shape, it works well both practically as well as aesthetically, as it's comparatively easy to fit a number of tom-tom pads into a confined space.

The drums are available in any colour as long as it's silver. The back of the pads is moulded from a perspex-like material, with the silver coating actually applied to the inside so that the finish is good and glossy.

The head is quite an interesting structure, as it seems to comprise a plastic skin stretched over a tough, slightly padded backing. This is clearly a different approach to pad design than that currently adopted by most British electro-pad manufacturers, who all tend to use rubber for the playing surface. For all that, it does feel very much like the real thing, being both resilient and responsive.

The system's modular nature means that any suitable stands may be used with it. Fixing to the pads is via the now fairly standard right-angled splined brackets. The stands supplied by Roland are in fact made by Tama (themselves recent entrants into the electro-percussion world), and seem very solid. You'll need three for a six-piece kit, two for each pair of toms and an individual snare stand. Leads can be of either the jack-to-jack or XLR-to-jack variety, there being sockets for both types provided on each pad.

The sound-generating side of the Roland system is contained neatly within a 2U-high ▷

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rack-mountable box, to which each of the six drum pads is connected. There are individual outputs for all six voices, though as an alternative there's a composite output, available in either mono or stereo with the instruments panned across the field.

In keeping with Roland's policy of sticking MIDI on everything they make, there's the full complement of MIDI In, Out and Thru sockets. And in line with current trends in keyboard design, the 32 kit memories are arranged in banks; in this case four banks with eight sounds per bank. You alter parameter values using a single continuous controller, after selecting the particular parameter via the relevant pushbutton on the front panel's Edit section.

Sounds themselves are created in two stages. The first of these is to edit and store up to eight variations of the basic sounds for each of the six drums in the kit. Then, you assemble these sounds in any combination to create a 'kit'; the system can store up to 32 of these. Extra storage of all parameters and sounds is available via external memory cartridges, which you insert into a slot on the DDR30's front panel.

The cartridges have two separate memory 'areas', each of which is capable of storing the entire contents of the system's onboard memory. So with the DDR30 plus one memory cartridge, you have the storage capacity for 92 separate drum 'kits'. Now, with six drums per kit, you're not going to get 564 totally unique and individual drum sounds. Still, the arrangement makes the change from one kit with, say, heavily damped tom-toms, to another with more open toms, a matter of pressing a single button.

The Roland comes loaded up with a selection of preset voices, so you can try it out right away, exploring its full potential as you become more familiar with its operation.

Sound-generation is all done digitally, with the basis of each drum sound being a choice of four digitally-stored voices that can be further modified by the user. The four sounds range from conventional to anything but, yet they all possess that peculiarly digital authenticity analogue circuits have so much trouble capturing.

Once you've decided on the basic sound you want, you can tailor it in a number of ways. The most obvious of these is to change pitch, but there's much more to it than that, as a grand total of 16 parameters (arranged in four groups) lurks within the DDR30, just itching to be edited.

The first group allows you to select which of the four voices you want, how loud it should be, and how long it takes to decay. Additionally, there's an 'Attack' component to the sound, which incorporates Level & Decay controls and functions dynamically – so the harder you hit, the more Attack you get.

Group 2 is concerned with controlling the overall pitch of the sound, and also allows you to add pitchbend. The effects created by this section are also dynamic, and are shaped by two controls labelled Bend Decay and Dynamic Sensitivity.

Group 3 is the EQ section, and consists of programmable bass and treble controls, both of which offer cut or boost of the relevant band of frequencies.

Last and possibly least, Group 4 controls the Gate function. There are two gate effects (designated, with sparkling originality, Gate 1 and Gate 2), the first coming into effect only when the drum is played hard, the second being independent of playing intensity. Gate 1 has Level, Time and Release controls, which make it suitable for creating that oh-so-fashionable gated reverb sound, or at least a fair imitation of it. Gate 2 has only Level and Decay Rate controls, so it's more useful for cleaning up the end of a sound, or creating one that suddenly 'gates off' after the main Decay level causes the sound to fall below a certain setting.

Sounds ***'It's the sort of system you think you've exhausted after two weeks, only to discover new sounds months later.'***

How does the Roland sound? Well, that depends pretty much on whether you choose the more conventional voices to work from, or those of a more esoteric nature, the origin of which we can only guess. Luckily, careful use of the Attack control means all the sounds can be made nicely percussive, and useful within a drumming context.

But as with all systems that rely on single, multi-functional controls which prevent you varying more than one parameter at a time, achieving the precise sound you're looking for can be a *very* long-winded process. You can't hear the results of any interplay between two or more variables, so the only way you can judge their effect is by switching repeatedly from one to the other, adjusting each a little at a time.

That said, the Roland system of providing a basic sound that can be used as it stands *or* edited using the parameter controls, does make the whole thing much easier to cope with. You're never left feeling in the middle of nowhere. All the basic voices are pretty good in themselves, and they also provide excellent starting points for your own creations.

It's the sort of system you think you've exhausted within the first couple of weeks, only to find yourself still discovering new sounds months later.

Being able to adjust EQ levels for each voice not only adds to the variety of onboard sounds, but also means that you can get away with an amplifier not over-endowed with preamp controls.

Simple alterations in pitch are all you need to take the snare sound from a deep, slack drum to a tight, jazzy one. Meanwhile, the Decay control proves an excellent method of simulating damping. Being variable over quite a considerable range, it also enables you to generate dramatically long snare and tom-tom sounds.

The gating section takes a little getting used to, as you need to get the gate to close before the end of the voice sample if you don't want to hear the less-than-artistic sound of the drum 'cutting off'. This doesn't take too much practice, though, and you have the option of using the cut-off as part of an off-the-wall voice. You can even get a fair 'gated' reverb effect using this facility, though as with all electro-kits, a bit of external reverb improves the sound of the Roland no end.

Yet in spite of all this, the kit doesn't have quite the same flair as the Simmons SDS9, its most obvious rival. Both kits are MIDI-equipped, both are in the same market area (though the Roland is some £300 more expensive), and both are superbly built.

But the Simmons scores in incorporating more than one method of sound-generation – albeit spread unevenly across its drum voices. Even though the Roland has a fair bash at typical analogue sounds, its all-digital synth section means it's the more modern voices that stand out as being noteworthy.

On the credit side, you can buy the Roland kit one step at a time, thus keeping both bank manager and band manager happy at the same time. And however far you look, you couldn't buy a better-looking set of pads. ■

Prices DDR30 control unit £999; PD10 standard drum pads £85 each; PD20 bass drum pad £175. All prices include VAT.

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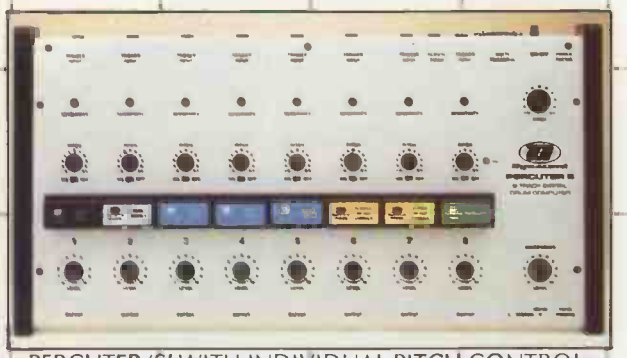

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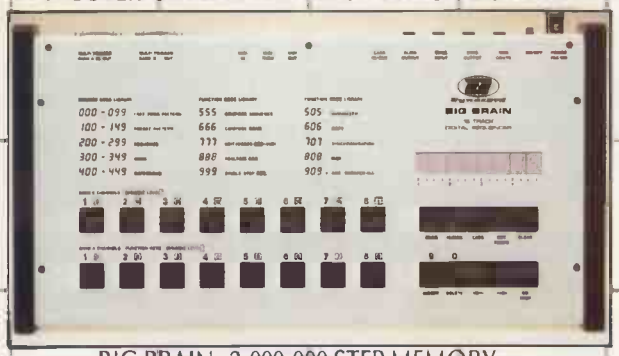

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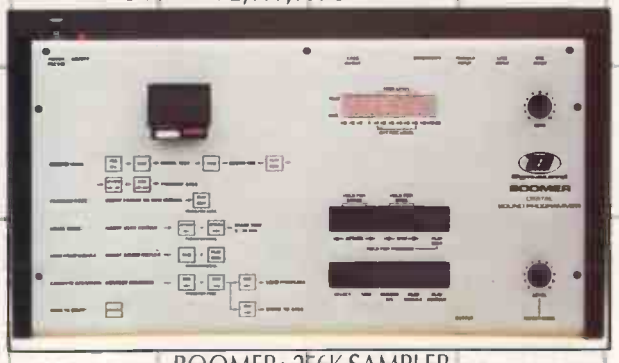

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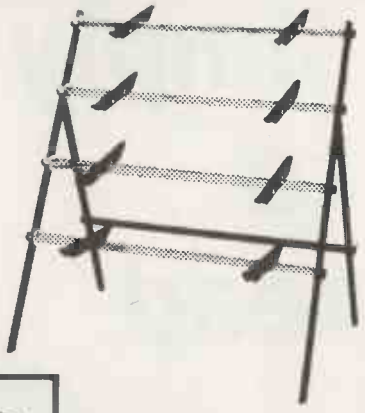

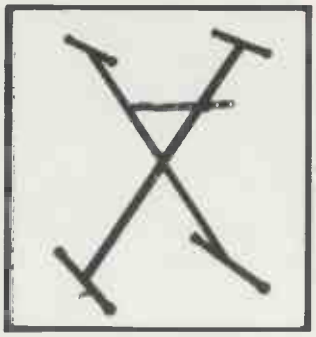

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CHECKLIST returns to the subject of dedicated sequencers, software packages, and computer music systems this month.

As usual, this is the area that's the most difficult of the three to compile, especially on the software side of things, where product lists, specifications, and prices are subject to constant fluctuations. Please bear with us if you find something in the High Street music store isn't quite as described in the list that follows. And if you discover something that isn't listed here at all, drop us a line. Getting information out of manufacturers can be a pretty thankless task at times!

As we said in last month's leader comment, the software revolution hasn't quite got into gear yet. There's plenty of it about, of course, but the market for dedicated sequencers has been relatively unaffected by its appearance – hence the arrival of a couple of new dedicated models three months ago. If there's one section of the software industry that's really booming, it's that for upmarket packages based on suitably upmarket computers, like the IBM PC and Apple Macintosh. Unfortunately, the availability of some of these programs (most of which are American in origin) in the UK is open to question. We're in the process of compiling a thorough rundown of what's available and from where, and we hope to publish the results soon.

Problems aside, the CHECKLIST formula remains unchanged. A make-by-make listing of products, complete with typical retail prices, some brief specification details, and the comments (for, against, and concluding) of our reviewing team where applicable.

Next month: back to the beat, with an up-to-date rundown of drum machines and electronic drum kits.

SEQUENCER

CASIO

SZ1 – £299 Four-track digital MIDI sequencer, step- and real-time recording options; storage capacity 3600 notes (step time), 1800 notes (real time); switchable touch data response, cassette and cartridge storage, MIDI-only synchronisation. + *Cheapest dedicated MIDI recorder yet, and without too many sacrifices, two MIDI Outs, easy to use;* − *doesn't store pitchbend data, available memory could be restricting, cartridges aren't cheap;* = *inherent limitations are tolerable given machine's big price advantage over everything else, thus good value, two SZ1s MIDI'd together would make a neat eight-track sequencing system for not much outlay.*

KORG

SQD1 – £599 Two-track MIDI recorder, step- and real-time recording options; 15,000-note storage capacity; MIDI In, 2 MIDI Outs, Sync 48 (Korg standard) and tape sync facilities, quick-disk storage. + *Logical layout gives excellent ergonomics, hence machine is one of easiest to use, disk storage is quicker, more convenient, more reliable than just about anything else;* − *non-variable clock rate obliges you to buy adaptor unit if your system's not a MIDI one, two-track format could prove limiting;* = *viable and presentable alternative to previously-available machines, with more than the odd bit of design inspiration to help it on its way, shares QX7's 16-channel MIDI assignment system, which is good.*

OBERHEIM

DSX – £1195 Sixteen-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, but see below;* = *obvious choice for Oberheim system owners that's been subject of recent price reduction, now has limited MIDI capability thanks to US company J L Cooper's Oberface – if you can find it.*

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 – £399 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 – £799 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;* = *a deservedly and consistently good seller, but position of prominence now under threat from recent rivals and arrivals.*

YAMAHA

QX1 – £1999 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 Micro-Composer, but polyphonic and a lot more flexible.*

QX7 – £449 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, still a good bet for the money.*

SOFTWARE

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.*

FIREBIRD

Island Logic 'The Music System' – £40 Real- and step-time MIDI sequencer for Commodore 64, available on disk only, compatible with SIEL and Passport MIDI interfaces. + *'16-bit' graphics on an eight-bit machine, complete with icons and pull-down menus, excellent cut-and-paste facilities on music display within step-time section;* − *long loading times between sections, system obviously designed for SID chip and adapted for MIDI later, thus MIDI facilities limited;* − *beautifully structured, reasonably priced sequencing package, and a glimpse into the future of MIDI software design.*

HINTON

MIDIC 1.1 – £300 (10K), £350 (10K with battery backup) Intelligent interface between MIDI and RS232 computer-standard connection. Includes utility program that allows incoming MIDI data to be viewed on-screen to assist users wishing to write their own MIDI software. + *Excellent idea put into practice with competence by company with limited resources, system is essentially open-ended;* − *current software lacks non-MIDI facilities, R&D costs passed on in high-ish selling price;* − *one of the best thought-out MIDI packages to appear since the system's inception, though its eventual success will depend on the software-writing skill of others. Also available: interfaces for Yamaha REV1 and AMS 15-80S, both £400.*

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, aftertouch 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 – £45 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 – £50 Commodore-based patch-editing program for Sequential SixTrak and MAX polys. *To be reviewed.*

Scorewriter – £340 Combination program produces hardcopy screen dump of music notation display from sequencing software; price includes 12-track Studio and Sequence Chain programs stored on EPROM. *To be reviewed.*

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 time-base), 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.*

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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; – *Apple isn't exactly world's best-value home micro;* = *well thought-out and eminently usable real-time sequencing package.*

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.

MIDISOFT

RAP Software – £37.50 Drum sequencing and arranging software for MIDI drum machines and Spectrum or Commodore 64 computers, works with variety of hardware interfaces. + *Ingeniously written package acts as central rhythm programmer for collection of MIDI drum machines, allows transfer of patterns from one machine to another;* – *could have shorter tracks and the ability to store more than one machine configuration at any one time;* = *a brilliant piece of software that costs little, does a lot, and deserves to be in the home of every MIDI drum machine owner.*

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 Plus Software – £120; MIDI/8 Plus – £180 Disk-based real-time sequencing packages for Apple II and CBM64; four-track, 5500-note capacity (MIDI/4), eight-track, 11,000-note capacity (MIDI/8). + *Extensive overdubbing facilities now matched by a decent range of editing options, plenty of support from one of computer music's most active companies;* – *still too expensive to be a really major force in the UK marketplace, though they do at least have a distributor now;* = *better than average software at a higher than average price.*
Music Shop Software – £80 Step-time music transcription package for Commodore 64 and Passport MIDI interface. + *Excellent display/printout facilities, ease of use, cheaper than you expect;* – *doesn't really make the most of MIDI, no real-time input;* = *one of the best music transcription packages available for budget micros.*

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. 'Muse' software for Commodore 64 could be available soon.*

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 assign, 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.

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; control over tempo, looping facility. + *Simple to use, inexpensive;* – *obvious limitations of single-track format;* = *good starter* ▷

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program for the short term.

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 DK80 Editor has 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 Data Base – £39 CBM/Spectrum disk- or cassette-based synth program file, stores 250 patches for any MIDI synth except Yamaha DXs and Casio CZs. + *Versatile program that lets you house synth patches in related 'families', among many other things;* − *nothing we can think of;* = *well-conceived and user-friendly package that does something really novel with the MIDI standard, and a real bargain.*

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.*

DK80 Editor – £55 CBM/Spectrum disk- or cassette-based Editor for DK80 polysynth, gives full control over user-adjustable parameters by joystick or QWERTY keyboard, complete with real-time waveform shaping, Help pages. + *Excellent graphics, coupled user-friendly operation;* − *the fact that similar packages don't exist for a bigger range of synths, sluggish cursor movements, the odd bug or two;* = *makes parameter editing more rewarding, proves new technology can assist sound-changing to good effect.*

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

SDS

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 2B – £495 British-built all-in-one MIDI sequencing package for BBC B, comprising ROM-based step- and real-time sequencing software with extensive editing and song-chaining facilities, DX7 voice dump. + *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's gaining increasing support from the professional fraternity.*

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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

AKAI

CPZ1000 Music Computer – £TBA MIDI music computer incorporating twin 3.5" disk drive in 19" rack-mounting format.
Specifications as yet undisclosed, but auxiliary hardware includes RZ1000 recorder panel, EZ1000 editing module, and MZ1000 CRT display unit, all expected to be available before end of year. *To be reviewed.*

ATARI

520ST Home Computer – £700 68000-based home micro with 512K RAM, mono monitor and disk drive included in price; built-in MIDI In and Out sockets, GEM graphics system, BASIC and logo programming languages. + *Excellent graphics, interfacing, language implementations add up to extremely attractive computer package on which MIDI is even more attractive bonus;* − *no MIDI software available yet, internal sound chip is a bit of a let-down, package too pricey for most first-time home computer buyers;* − *all in all, probably the immediate future of non-dedicated computer music systems, or at least a major part of it, even more musician interest now that downmarket 128K model has been resurrected – should be available here soon.*

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 – £1295 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. + *Superb sampling sound quality, good range of sound-modifying options, user-friendly control layout, European version's better (than US equivalent) keyboard and disk drive;* − *lack of step-time facilities limits sequencer's usefulness, demand outstrips supply in some areas;* − *wonderful sampling machine with a (recently reduced) price that brings the technique within reach of vast numbers of people for the first time, now with user-formatting and advanced sampling software built in for the first time.*

FAIRLIGHT

CMI – £28,500 + VAT (basic system) 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, new looping and editing software improves system's versatility;* − *not very easy to use, poor interfacing;* − *still one of the cheapest ways of getting into polyphonic sampling, if you have an Apple, Greengate have lots of new things in the pipeline, but they won't tell us about them.*

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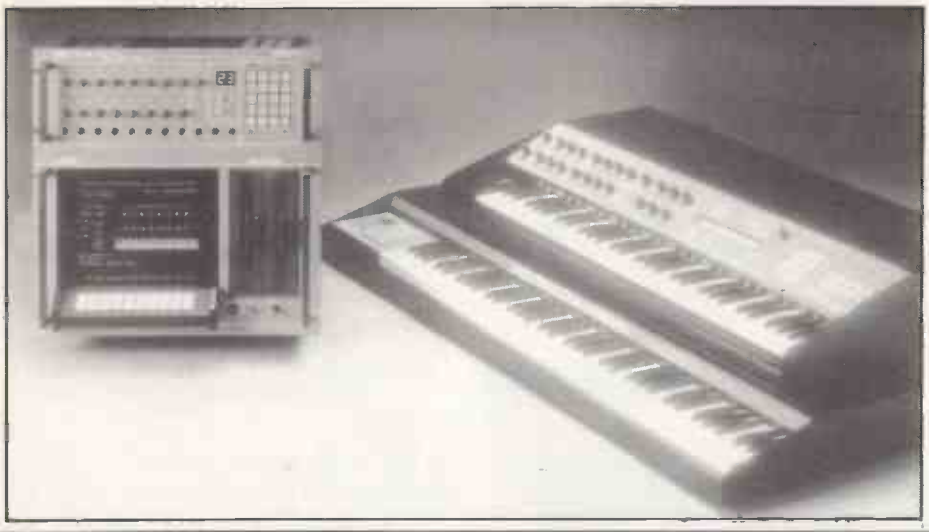

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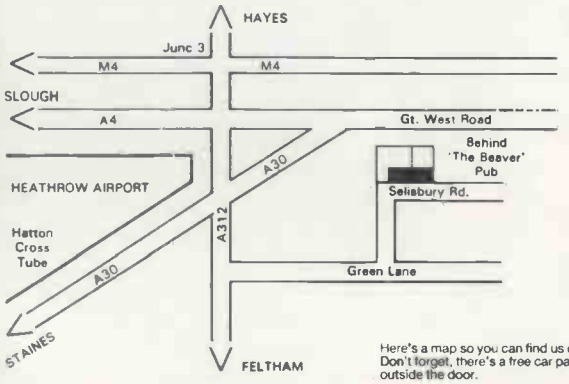

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THE APPLIANCE OF SCIENCE

Barry Truax *organiser of this year's ICMC, and the man that made its music content more accessible*

Following last month's report on Digicon '85, we bring you news on another event that took place in Vancouver just a couple of days later – the International Computer Music Conference. *Ron Briefel*

'They're living in a world of their own!' said one perplexed Digicon survivor who had decided to stay on for the International Computer Music Conference (ICMC), and had just sat through a particularly taxing paper entitled 'Semiotics and Computer Music Composition'.

Whilst it's true that a double PhD in Digital Signal Processing and Computer Musicology would have gone some way toward helping many visitors decipher some of the presentations at this, the second of the two Vancouver conferences, it's also true to say that, if you persevered, there was much of interest mixed in between the impenetrable algorithms and incessant verbiage.

If anything, the Vancouver ICMC was one of the most productive yet, partly because it came at a time when there was a definite movement of academics away from the university research labs and into commercial positions. Part of the reason for this is shortage of research funds, but there are now some lucrative job offers from commercial concerns, who are becoming increasingly aware that 'top brains' are essential to have onboard if they are to keep up with competition from other firms. At Digicon, both Roger Linn and Bob Moog acknowledged the necessity for employing highest-level technologists in the development of the Linn 9000 and Kurzweil 250 respectively.

And it isn't just a case of academics going into the marketplace. There's also been a substantial increase in the numbers of engineers and designers from commercial companies attending the conference – so the exchange has worked both ways. This year, companies such as Eventide, E-mu, Apple, Roland and Yamaha successfully infiltrated what has been, in the past, an almost exclusively academic forum.

One of the effects of this new dialogue is that even the established 'centres of excellence' for large-scale computer music research and development such as IRCAM, MIT and Stanford have caught the commercial bug, and are getting more involved with smaller, streamlined systems, often scaled-down versions of their larger installations. IRCAM, for instance, is making its CHANTES and FORMES programs available as micro-based packages, and a lot of research has been going on with relatively run-of-the-mill machines like Macintosh computers and DX7s.

Many of the papers at ICMC dealt specifically with commercial or potentially commercial systems. In the case of the latter, it seems the conference is becoming very much a meeting place for people to negotiate ways of crossing the threshold from theory to reality.

One such paper was presented by Mark Lentczer of Apple. He described a system called the Sound Kit, which is essentially a software package for manipulating and editing several individual sampled sounds and assembling them into a composite musical structure. 'New' terms such as paste, copy, cut, zoom, merge, undo, and

redo are used to describe the processes used in the system, all of which are undertaken on the Macintosh via its powerful graphics capabilities. The fact that Lentczer didn't talk about any hardware suggests that the system is yet to be formed into a commercially-viable product. If this is indeed the case, he was certainly in the company of the right people: it shouldn't be too long before a rather interesting multi-sampling sound-manipulator becomes available for the Macintosh. And when it is available, it should bring with it the possibility of digital versions of musique concrète-type tape manipulation techniques, where several sampled sounds are processed and interrelated at the same time.

Another Mac-based system discussed at the conference was the Sound Designer package for the Emulator II, reviewed elsewhere this issue by Paul Wiffen. From what I've seen, I'd say the system amounts to an impressive low-cost Fairlight alternative: the paper describing it – presented by E-mu's Dana Massie – was little more than a cleverly camouflaged sales pitch. There were to be several more of these during the conference, and that's not a criticism, just a comment on the way things are going. If anything, I'd say the fact that designers of commercially-available systems have a forum in which to discuss them in detail to a technically-literate audience is A Good Thing.

Gesture mapping techniques and sensors for playing computers with expressive control were some of Vancouver ICMC's most dominant themes. Many of the ideas involving highly touch-sensitive interactive graphics surfaces and body sensors will, I'm sure, find their way into commercial products in the not-too-distant future. We'd already seen Bill Buxton's touch tablet system at Digicon, but at ICMC a rival system was presented by Eric Johnstone from McGill University. It's called the Rolky, and it consists of a glass surface illuminated by a cathode ray beam. When a finger touches the surface, the conditions for internal reflections of the rays are disturbed, causing a bright spot at the finger's location. This spot is recorded on a TV camera and digitised. It is then analysed to extract spot co-ordinates, size, angle, and elongations, all of which help to define how the surface was touched. Polytouch (ie. multi-spot analysis) is also possible, and this allows users to use the whole hand or both hands to 'touch a computer'. The system is said to have extremely high resolution, enabling the playing of a connected synthesiser with violin-type sensitivity. We shall see.

Another system providing information generated by finger/hand/arm gestures is 'The Hands', a product of Steim Studios in Holland. A paper describing it was presented at the conference by Aad Te Bokkel, a software engineer at Steim. 'The Hands' is a set of remote MIDI controllers consisting of two aluminium ergonomically-shaped plates, with sensors, potentiometers and switches strapped under the hands of a 'performer'. Analogue information

generated by finger movements and changes in hand/arm positions is scanned by a microprocessor with an onboard MIDI encoding program. The MIDI codes that are generated can then be sent to any MIDI instrument. The user can define which movements control each of the MIDI data parameters, and the switches and pots can be programmed to act as remote controllers for synths or other MIDI devices connected to the system. They could, for instance, represent pitchbend and modulation wheel controls, preset voice switches, or even the status of a DX7's internal operators. All in all, an impressive and extremely versatile system for movement-generated music – but it isn't the only innovation the Dutch were showing at ICMC.

Steim are also working on a 'MIDI Assistant' intended to solve MIDI incompatibility problems and enable code reprogramming to change the meaning of MIDI – echoes of Digicon's reverse pitching and pitch-to-patching here, I'm afraid.

Another Steim engineer by the name of Joe Ryan is busy modifying Yamaha's CX5 to enable microtonal intonation on each of the eight voices, so it seems Steim Studios are just about the busiest champions of small, affordable systems currently researching.

A couple of ICMC papers dealt with computer tracking of live instruments.

Barry Vercoe of MIT presented a paper called 'Training the Synthetic Performer', which described a system in which data representing score information is prepared and fed as control processes to a host processor.

Through pitch-detection devices, the processor can follow a live performance and then trigger the controls necessary for a synthetic accompaniment. Intelligent decisions can be made by the processor with regard to tempo and pitch errors by the live performer, and more interestingly, the system also has the ability to actually 'learn' during rehearsals to allow for a performer's particular phrasing or style in interpreting the score. Thus, it learns to alter its own score data to match the live performer's playing technique. Who said computers aren't friendly?

Roger Dannenberg also presented a paper on computer accompaniment, but concentrated on the problems of tracking polyphonic performances (Vercoe's system is essentially monophonic). Again, 'score' information must be fed in advance, and the system employs several matching algorithms after grouping notes into sets of events.

The natural extension of these separate systems would be a composite one incorporating Vercoe's learning capabilities and Dannenberg's polyphonic tracking, but nothing exists along these lines yet. And if you think all this sounds too scientific to have any relevance to music, some possible applications of computer tracking techniques are surprisingly close to home.

Take electro-acoustic concerts, where tapes and orchestra often co-exist in an uneasy 'fixed time'. A new situation could well arise in which the musicians and/or conductor can dictate the pace of a piece of music, and any required tape accompaniment would simply follow humbly along.

Then there's conventional rock music, where it should become possible for backing tapes and sequencers to follow key musicians, rather than the other way round.

As far as research is concerned, a lot of the ideas (or 'heuristics') for computer tracking have developed as a result of the influence Artificial Intelligence has had on the computer music community. Musicians have already benefitted from the way AI has been used in the research and development of commercial products such as the Kurzweil 250.

One area that AI features prominently is that of computer-aided musicology, in which styles and techniques of past composers are analysed in great detail and artificially-intelligent models are developed to enable generation of 'new pieces' in the style of those composers, many of whom are now long dead.

Now, some new music composers have 'borrowed' this idea and used it for their own devious ends. This borrowing usually involves putting a spanner in the works in one way or another, like introducing a random variable to upset a model or programming a carefully-engineered deconstruction. Letting the AI model add to its own knowledge base (ie. software writing its own software) is another interesting possibility. Whatever the nature of the 'spanner', its introduction can result in some sparklingly original and thought-provoking music. There were several examples of this at the conference – though I shan't name names in case the composers concerned object to my description of their compositional process...

All in all, the music at Vancouver ICMC reflected a noticeable change of direction, itself probably related to the developing academic-commercial technology dialogue. This dialogue is still not as widespread as many would like it to be, and I doubt any of the music performed at the conference will make the Top 40. But there was a marked tendency toward a more engaging, more accessible, and in some ways

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TO E&MM

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more physical music that contrasted starkly with the cerebral, esoteric style of so much early computer music.

As an example, composer Morton Subotnick, an electronic music pioneer with works such as 'Silver Apples of the Moon' under his belt, professed to being extremely optimistic and excited by current developments. He has recently been working exclusively with the Yamaha QX1/TX816 system, and his latest work was actually premièred at Digicon as an FM tape piece. Along with other composers such as David Keane and Bill Buxton, Subotnick claims to be heralding a new age for contemporary music, in which computer technology will break down the polarisation between academic and non-academic music. The intention, it seems, is to create something akin to a Digital Folk Art form which listener and composer unite in a shared experience. A little unrealistic, maybe, but wouldn't it be good if even a fraction of this barrier-breaking actually took place?

Of all the tape pieces played at ICMC, Paul Dolden's 'Veils' was particularly memorable. Ironically, this didn't actually use computers to generate any sound, but was based instead on computer music research into textural transformation. The sheer physical power of the piece's mass, textural movement through endless layered timbre manipulations was quite stunning. Most of it was assembled on a Tascam eight-track using carefully recorded real sounds, so it's the kind of thing almost anyone could do, no matter how ugly their bank balance.

Other interesting tape pieces included David Keane's 'Elektronies Mozaik', an engaging rhythmic romp with the DX7; Denis Smalley's impressively spatial 'Tides', which was divided into two performances, one out of doors, the other in; Paul Berg's wonderfully painful string quartet, which used distorted plucked string algorithms; and Barry Truax' 'Solar Eclipse'. Truax was, in fact, the host of the conference, and his piece had a quality of involvement and accessibility that was common to a lot of the conference's music.

The live music was less impressive. Several pieces used interesting 'mad-professor' invented instruments, and there was a lot of MIDI interfacing. But overall, it was a case of too much technique, not enough content.

Richard Boulanger's 'Book of Dreams' was a case in point. It utilised Max Matthews' electronic violin, with each string MIDI-linked to a separate synthesiser. It made some interesting noises, but not much else.

David Rosenboom's 'Zone of Influence' had more going for it: a relentless but enjoyable interaction between Buchla synth and percussionist. This was followed by an extra-curricular happening after the official conference had ended, in which Donald Buchla (who'd been present at some of ICMC but kept a low profile) performed on his own digital 400 synth together with Rosenboom on the Buchla Touché. The duo presented us with a piece that was as good as, if not better than, any of the live music at the conference itself, essentially a controlled improvisation full of interesting rhythmic cascades and unexpected (to the audience, if not to the performers themselves) twists and turns.

Rosenboom, incidentally, was the man responsible for 'Brain Music for John & Yoko', which was performed on them on American TV in 1972.

Your intrepid reporter was fortunate enough to meet up with Alex Douglas of CLEM contact list fame. As well as taking me up to see his extremely impressive 'nerve centre', he also invited me along to the *Alien Soundtracks* radio show he presents – along with others – every Saturday evening. Vancouver is blessed with several electronic music radio shows, a fact which, for a city no bigger than the likes of Manchester or Sheffield, certainly puts British endeavours to shame. *Alien Soundtracks* presents a good cross-section of mainly European (including several British) acts, and I found myself becoming extremely envious. Fancy going all the way to Vancouver to hear stuff that should be on the radio over here...

Next year's computer music conference is closer to home. It's to be held in The Hague, Netherlands, on October 20-24. Conference organisers are the Computer Music Association (CMA), who can be contacted at PO Box 1634, San Francisco, CA 94101. Members receive a regular newsletter called *Array* that's currently undergoing the same transformation as the conference itself, ie. a growing interest in smaller, affordable systems and the inclusion of useful information on MIDI, complete with a MIDI agony column and an information contact list. Members also receive a 10% discount to the International MIDI Association. ■

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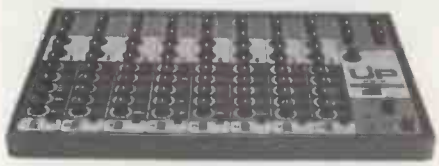

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OUTTAKES

Critical comments on matters musical on record, cassette, and concert stage. Plus a plea for better pictures of the readers who send us demos. *Tim Goodyer & Simon Trask*

VINYLTAKES

A couple of releases well worth a trial spin are Roger Eno's **debut album *Voices* and** Michael Brook's ***Hybrid*. Both are released on EG, that Kings Road bastion of art music credibility, and both share Brian Eno (Roger's elder brother and E&MM cover artiste) and producer Daniel Lanois as common ground. Roger's work is Lanois-produced, piano-oriented ambient music that bears more than a passing resemblance to the work of Erik Satie. Sparse, atmospheric tinklings are enhanced by a little acoustic bass and some subtle synth touches, but the biggest influence is the sound-treating of brother Brian, which toys with the record's arrangements dramatically without the listener ever really knowing it.**

Eno senior and Lanois take a more active part in the realisation of *Hybrid*, with Eno contributing additional piano and Lanois some intriguing percussion. But star of the show is Brook's own guitar work, which emerges as a cross between Santana's infinite sustain and Jon Hassell's rootsy ethnic trumpet.

More, please.

*Talk of failed follow-up singles brings us neatly to **Princess**' successor to the wonderfully-addictive 'Say I'm Your Number One'. 'After The Love Has Gone' (Supreme) is as lamentably run-of-the-mill as its title: maybe they should rename it 'After The Last Single's Gone'. You can just see the producers now, taking most of the elements from the previous hit (pounding drum beat, seductive synth noises, smooth-as-silk production job), and mixing them with a melody that's just about recognisable as something different. But competition on today's dance-floors is fierce, and if you don't stay one step ahead, you're likely to go two steps behind. Overworked, underdone, and generally out of the picture.*

*On a commercial note, **Level 42** make their first return to these hallowed pages with the release of their latest long-player,* **World Machine**. *There's no evidence of any digression from the path the band embarked on many moons ago, but there is a marked progression along it. Most noticeable is the distillation of Mark King's bass playing, as he follows Louis Armstrong's footsteps in learning that speed isn't everything. This isn't a cause for concern – the flash is still there – but bass-playing is better integrated into the overall sound now. The music is still jazz-funk at its most sophisticated and invigorating, and the album boasts two exceptional tracks in the beautifully-delicate 'Lying Still' and the compulsive 'Physical Presence'. Richly, thoughtfully layered with impressive synth patches, powerful drums, tasteful guitar and some stunning bass guitar work, this LP is one of the most confidently-arranged to hit the editorial doormat this year. Some of the production and writing credit goes to Synclavier specialist Wally Badarou, whose understanding of matters musical and aesthetic is evident throughout. If you've never danced before, this is the place to start.*

***The inevitable follow-up to** Paul Hardcastle's **definitive '19' has finally arrived. Called 'Just For Money' (Chrysalis), it has a similarity to its elder sister that's inescapable. There's the predictable dialogue (courtesy of Lord Olivier and Bob Hoskins) interspersed with catchy female vocal distractions, a TR808, a bit of sequenced bass and some tasteful chord embellishments. Subject matter is the Great Train Robbery, something that adds to my suspicion that Hardcastle's main aim in life is to create a collection of musical pieces that documents all the great events of recent history from the point of view of an overworked drum machine. A dancefloor cert, but not the breath of fresh air that was '19'.*

Liberated from the confines of the messy, lack-lustre co-operative that was The Power Station, the emotive voice of **Robert Palmer** can be found, once again, in a sleeve bearing his own name. The single in question is 'Discipline of Love' (Island), and it sees Palmer's vocal well up to its usual forceful, dynamic standard. The song is an obvious single, with a presentation glossy enough for it to shine out from the drabness of TOTP, thanks to a strong funk feel that uses a tightly-sequenced sampled bass line and lots of sparkling digital sounds. The chorus is a model exercise in The Art of the Hook, and should guarantee the single prolonged occupation of the DJs' turntables.

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DEMOTAKES

Claiming to be a Latin quartet but sounding more like a straight jazz outfit are ***Marakatoo****. Three instrumental tracks from this Welsh band constitute a discouragingly safe demo best suited to Radio 2 airplay or BBC test-card accompaniment. Which is a pity, because the musicians can all obviously play, and the songs, though not original, are arranged and recorded with competence. There's a regular drummer in the line-up, but all the drums here are taken from a TR707, with a little hand-played percussion to brighten things up. The playing overall is very tight indeed, the best moments coming with the appearance of some elegant double-tracked flute and sax work. Sadly, this is juxtaposed with a musical illness that's spreading through DemoTakes like AIDS through San Francisco: The Soggy DX7 Preset Disease.*

Arctic Summer are another band with vocal problems (well, it's better than sneezing TR606s). Of the group's three members, Robert (the only male) is responsible for Simmons playing Drumulator and RX11 programming. The remaining members are vocalist Phoene and keyboardist, Zog and between them, they make a noise that's not half bad. Although there's another backing singer, Liz, helping out, she's powerless to help with the problematic lyrics, the unimaginative use of harmony, or the singular lack of vocal presence exhibited everywhere except in the chorus of 'What's In It For You?'. From this, it's obvious that the potential is there to deliver a powerful and emotive line; it's just that most of the time, that potential isn't being realised. The recording is a Portastudio affair and sounds quite presentable, as does the songwriting, but the singing...

And now it's the turn of Guns Will Fire, better known to his friends as Smac. Smac mixes cosmic lyrics with Jake Thackeray impressions, and still ends up sounding strained. The ubiquitous Portastudio strikes again and leaves a reasonable semblance of music behind it – though the sound is a little on the toppy side. The drum machine credit is a bit vague, but whatever its source, that toppiness projects it through the mix to the point of distraction. But enough of the criticism. 'Guns Will Fire' – the track, not the artist – is the best of the six songs, and deserves credit for remaining attractive in spite of some dodgy synth patches from a CS60 and Casio 1000P. Still on the subject of 'dodgy', in these days of digital reverbs it's amusing to discover some people are still persevering with Watkins Copicats. Congratulations, Smac.

Haven't seen too many job vacancies at Fostex advertised lately. Shame, because the company should offer **Alpha Contact**, otherwise known as Martin Ley, a post as demonstrator for their X15. It's on this modest machine that he's produced a rather impressive demo of his own. To be fair, he's used a pretty elaborate array of equipment to help him towards this end; an array extensive enough to include a MemoryMoog, Roland MC4B Micro-Composer and no less than three Moog Sources, as well as an enviable amount of outboard equipment. The music is heavily sequenced and uses sequencers and Drumulator in close collaboration to no small effect: the result is like a cross between the Frankies and Howard Jones. The disappointments are vocal melodies and vocal treatment. It's my guess that the recording has been done without resorting to bouncing, substituting the sequencers for overdubs. And it is because the standards of recording, music and production are so high that the vocals sound so thin in comparison. Still, an object lesson in making the most of your resources.

Lots of busy sequencers are one of the trademarks of ***Access****, on a cassette album* There Will Be Dancing. *Another X15 looks after the recording chores, leaving Mark Pennells to see to the singing, bass and some inspired guitar work, while Zarc Porter keeps the keyboards and rhythm programming under tight rein. The equipment listing is again a healthy one, including as it does a Yamaha RX15 and CX5M, which, along with an SH101 is responsible for some impressive bass sequences which augment Pennell's nifty bass work in the most harmonious of ways. Best of the songs is probably 'Easy Life'; like Nik Kershaw on a good day, it swings in a way most amateur material can't manage. In fact, Access have done their homework in the songwriting department, as the overall standard is high. The vocals are the next area for treatment, but that angry guitar really deserves a second mention.*

A word in your collective shell-like ear. It has come to the attention of the diligent E&MM review team that the standard of photographs accompanying readers' tapes is appallingly low – and that's if we're lucky. Surely you can't *all* be that ugly? Why not exercise a little photographic ingenuity to compliment your musical endeavours? After all, you never know who might be looking for another Culture Club or Lords of the New Church...

LIVETAKES

Man Jumping Africa Centre/ICA, London

Man Jumping recently made their live debut to a modest 70-strong crowd at the Africa Centre, just off London's Covent Garden. A few days later they played to a 200-strong crowd at the ICA, supporting enigmatic New Yorkers Arto Lindsay & the Ambitious Lovers.

'Systems music' is a pretty loose definition at the best of times, so to put MJ in the same category as Philip Glass and Steve Reich would be a mistake. For one thing, the band's music draws on a wide range of sources including African, jazz and Caribbean music. And in contrast to ▷

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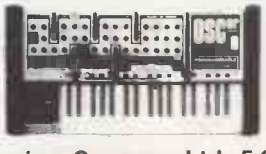

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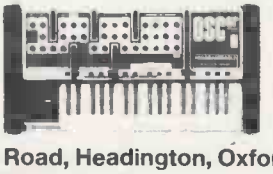

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▷ the unidirectional, relentless driving force of Glass' output or the contemplative character of much of Steve Reich's music, Man Jumping follow their antecedents, Lost Jockey, in exploring a popularist approach to the systems manifesto.

On record, their multi-directional music sparkles and dances, without ever making you *want* to dance. Kicking off their set at the Africa Centre with a rearranged version of 'Down the Locale', the album's closing track, it was immediately apparent that Man Jumping live were going to be an altogether funkier beast than Man Jumping on record. If I had to pull out a label, I suppose it would be 'systems funk' – but that sounds contrived where the music itself successfully steers clear of being that.

The band is heavily keyboard-biased, with five musicians tinkling ivories of one description or another. It's a measure of the distance synths have come that a synth-based line-up doesn't have to mean great washes of cosmic sound á la Tangerine Dream. When Man Jumping play synths, they play them percussively – so it's no surprise that the line-up was dominated by Yamaha DXs, with an Oberheim OBXa, a Yamaha electric grand and a Mirage sampler also on hand.

Emphasis throughout was on tight, ensemble playing, the apparent spontaneity of the band's performance belying the pre-notated, polyrhythmic complexity of the music. Every member of the band is an accomplished performer, but unlike so many, MJ's performers actually enjoy themselves on stage.

Remarkably, the multitude of interweaving keyboard melodies added clarity where you might have expected it to produce a sonic mush.

Keyboard duties were handled by Sean Tozer, Charlie Seaward, Glyn Perrin and Orlando Gough, with John Lunn alternating between Status headless bass and keyboards. With Simon Limbrick on drums and Dawson Miller on percussion, that left the one solo (and soloing) voice, Andy Blake, merrily swapping between every saxophone you could think of. A powerful and fluent player, he commanded the lead spot with consumate ease – though it would have been nice to see some of the other players letting loose from time to time.

The band powered through eight numbers, barely pausing to take a breath. Songs from the album included 'Squeezi', 'World Service' and the wonderfully-named 'Belle Dux on the Beach' (though not, surprisingly, the single 'Aerotropics'). But they've obviously not been resting on their compositional laurels. The 75-minute set was divided 50-50 between album and new material, the latter including a 20-minute workout bearing the yet more wonderful title 'Lenin Offered a Job in Advertising'. And the new stuff is just as strong as that on the album.

Not all the pieces are up-tempo. 'It's Been Fun' and 'Collapso' are both slow, hypnotic pieces with sustained chords and long snaking sax lines, vaguely reminiscent of Herbie Hancock circa 'Headhunters'.

At the ICA they were every bit as hot as they had been at the Africa Centre, and drew an enthusiastic, if slightly bewildered, response from their audience.

Their next live dates are at Battersea Town Hall on November 30 and the Almeida Theatre on December 23 (both London venues), so if you're into music that appeals to the extremes of your body (that's head and feet, dum-dum), keep the diary dates free.

Level 42
Odeon, Birmingham

The second appearance of Level 42 comes in response to a recent live performance at the Birmingham Odeon on November 9, as part of the current UK tour. Opening to great audience delight with a stunning rendition of 'The Chinese Way' – the single that did so well for them in the charts a while back – the boys set a hot pace for the set that was to follow, faltering only over a broken bass guitar strap that saw Mark King adopting some rather unusual guitar hero poses in order to continue his instrumental and vocal performance.

This frivolity over, the pace settled down, and we were left with the tight, blistering melodic funk that's stood the band in such good stead for so long.

The difference between the Level 42 of a couple of years ago and the Level 42 of this autumn is that the songwriting has got better. Live, there's also an increased intimacy between band and devoted audience.

Mark King is as awesomely dexterous at getting thumb onto bass guitar string as ever, and has a bigger musical vocabulary at his disposal than ever, too. But he doesn't work alone. The interplay within the rhythm section was an object lesson in steadiness without monotony, and King was kept excellent company by guitarist Boon Gould and keyboardsman Mike Lindup, plus a guest female vocalist and sax player, all of whom were able to hold their own when the pace warmed up.

The set was well constructed and worked its way strategically through most of the band's popular singles, as well as a selection of material from the new album, World Machine. Notable highlights included the ballad 'Leaving Me Now', with a piano interlude performed live on an Emulator II that proved the piano sample is a viable alternative to the physical inconvenience of an electric grand. Also of note were Lindup's stage excursions sans keyboards, as he incited the audience to greater heights of involvement in the festivities.

High on the Regrettably Missing list was 'Physical Presence', one of the new album's brightest moments. But it was good to see the ol' faithful Fender Rhodes, an instrumental mainstay in an age of solid-state scintillation, and still a force to be reckoned with. For the life of me, I couldn't explain the presence on stage of a LinnDrum, stuffed behind the drum kit alongside the Roger McGuinn-bespectacled Phil Gould. If it had an audible part to play at all, it was a minimal one.

To the dismay of all in attendance, the show closed after two encores, 'Hot Water' and 'Are You Hearing What I Hear?', the latter culminating in a short showcase spot for each of the musicians. These were all short and well-judged with the exception of the drum solo, which involved the evacuation of the stage by the other musicians, and didn't really say anything that hadn't already been said, for all its precision and vigour. Even the absence of the McGuinn optics did nothing to improve the situation.

A physical presence? Definitely. ■

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EXPLORING ▶ NEW

Up until now, guitarists have had little choice as to what they use to control guitar synthesiser modules. But Gibson's new controllers are identical to the guitars that made them famous – except that they have Roland electronics built in. Words and photography *Paul White*

This time last year, if you wanted a Roland guitar synth, you had to have a Roland guitar to play it from. That was fine so long as Roland's range of controllers (past and present) suited your style, technique, and all the rest of it. If it didn't, you had little alternative but to stick your head in a pig, as they say.

But now, several manufacturers including Gibson, Steinberger and Hamer, have collaborated with Roland to produce their own guitars with Roland interface electronics built in.

The electronics are needed because the Roland synth circuitry gets its pitch information by analysing the vibrations of each individual string to extract the fundamental frequency. To this end, the first thing you need is a separate pickup for each string, a function performed by a slimline hexa-pickup. This is located just forward of the bridge, so that any lateral string movement caused by bending won't move the string away from its designated pole-piece.

Once the vibrations have been picked up from the string, they are amplified by the guitar's electronics, and each string has its own sensitivity control so that the synth's response can be tailored to the player's technique and the type of strings fitted. Also incorporated in this electronics package is the circuitry for monitoring the guitar controls and the touch-sensitive vibrato plates fitted to the guitar.

Though these guitars are designed to interface with the Roland GR700 MIDI guitar synth (which synth players will recognise as having similar internals to the JX3P polysynth), they will work equally well with the previous GR300 floor unit. They aren't, however, capable of working with the old GR500, Roland's first and most ambitious foray into the world of guitar synthesis.

Roland's own G707 system guitar, distinctive because of its shape and damping arm, was designed to give clean, even string vibrations with the minimum of overtones, as these cause pitch tracking problems.

The model under review is a modified Gibson Explorer (they do a modified Les Paul, too), a guitar that's been in production for nearly 30 years and which, as a result, has a mechanical design that takes no account of any of these synth-related considerations.

Because the pickup output is buffered by the internal electronics, the control layout has to fall in line with the other Roland guitars; a standard electronics module fits all models. This means that apart from the standard 'one, other or both' pickup selector, there are only volume and tone controls which affect whichever pickups are selected. You still get a direct output from the pickups on a standard jack socket, though, for those occasions when you're not using the synth at all, or for when your setup incorporates a separate guitar amp.

But why use two amps in the first place? Why use separate sound systems for synth and guitar signals when a Balance control on the guitar gives you control over relative levels?

First off, all guitar amps incorporate a certain amount of top boost to give what we currently regard as an acceptable guitar sound. But a synth needs a setup with a fairly neutral response, and sounds better through a full-range speaker system that does nothing to flatter the electric guitar.

Then there's the fact that if the guitar and synth signals are mixed together, there's no way you can treat them separately. Not much use if you depend on effects processing for much of your guitar and/or synth sound...

But back to the guitar, and an as-yet-unexplained control marked Filter Cutoff. When the guitar is used with the GR700, this control is used for patch editing, as is the Filter Resonance control, a small black knob nearest the bridge. Last of all is the Vibrato Depth knob, which operates in conjunction with the vibrato parameters stored in the synth programs.

As the floor unit is identical to the one reviewed in E&MM June '84, I'll make but a brief resumé of its functions. Like the JX3P, it can store up to 64 user programs, and it connects to the guitar by means of a locking multicore umbilical cord, which carries the low-voltage power, string signals and control information.

Although you can edit programs using just the GR700, life becomes *much* easier if you buy the optional PG200 programmer unit. This gives you lots of knobs to twiddle and switches to push, and obviates the need for that tedious increment/decrement business, a process that is to musical creativity what Vlad the Impaler was to embroidery.

So how well does the Gibson, a legend in its own lifetime but with not a hi-tech concession in its spec sheet, cope with being a synth controller?

Well, even the specially-designed Roland guitar needs to be carefully set up and played in a considerate manner to get it to behave. With that in mind, the Explorer does very well indeed. You need the right strings, and the distance between them and the hexa-pickup is crucial; set it up carefully according to the description in the handbook. That done, you have to develop an even, not too heavy-handed playing style if you don't want unscheduled accidentals appearing in your well-thought-out compositions. In particular, the open bottom E string has a tendency to yodel – though maybe a further go at setting-up and a more even playing technique would take care of this, too.

The really good news is that the guitar itself doesn't seem to have suffered any after-effects as a result of its Roland implant. It still sounds like an Explorer, sure enough, even though the strings on the review model were starting to get a little dull, and I was too mean to replace them in case the expenses application was rejected.

By way of comparison, I tried my GR300 system guitar with the floor unit and found it tracked far worse than the modified Gibson. This is probably because the optimum setting of the guitar's sensitivity controls is different for the GR300 and the GR700 systems. And this is a pity, because you can buy a special splitter box that'll let you drive two floor units at the same time, and which *could* have been used for playing a 300 and a 700 at the same time.

The fact that top guitar manufacturers are producing Roland-compatible guitars must be an indication that guitar synthesis is at last being taken seriously. And why not? There's no reason why the synthesiser should be a keyboard-only instrument. OK, so pitch-following problems mean that the guitar *is* a singularly difficult device to use to drive a synth – which is why it's taken so long for guitar synths to reach high enough levels of technical competence.

But a keyboard isn't much good if you've spent the last 20 years practising heavy metal clichés. Guitar synthesis is one of the few avenues guitarists can take if they want to strike out in a new direction *without* abandoning everything they've learnt to date. And the more synth-compatible guitars there are available, the quicker the word will spread. ■

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TERRITORY

THE AIR AND THE FURY

Gary Numan, master of synth entertainment, victim of the mass media, and revivalist pilot extraordinaire, shares an hour or two with E&MM at his studio in Shepperton. *Tim Goodyer*

Nestling in the middle of the Shepperton film studio complex in West London, among the vast hangars where the ghosts of *The Third Man* and countless Bond films still linger, is a recording studio by the name of Rock City. It's been there a while now, but since the Shepperton authorities have decided the studio complex should be film-only, its long-term future is uncertain. Never mind. For the time being, Rock City is the home of Numa Records, the independent label set up by one Gary Numan after he fell out with his record company a couple of years back.

Numan is a man with a considerable history. When E&MM last featured him in December 1983, he'd just released his sixth album (*Warriors*) for Beggars' Banquet. Since then, there have been two studio long-players released on Numa, *Berserker* in 1984, and *The Fury* last month.

In the public eye, it all began back in 1979, with Tubeway Army and the success of a catchy slice of electro-pop called 'Are Friends Electric?'. The single stayed at Number One for four weeks, much to Numan's personal surprise. His rise to fame was an unusually speedy one that did nothing to endear him to the weekly music press, whose criticism continues unrelenting.

Numan still feels strongly about it, six years on.

"Here am I Like a target in the flesh"

'I made it so quickly, I suppose. One day I was just trying, and the next day I was *it*.'

If anything, Numan has ceased to be upset by what the critics scribble about him. What concerns him now is that those who work alongside him are likely to get dragged down with the boat whenever they work on a Numan album. Which isn't surprising, when you consider that the list of Numan's recent collaborators includes the likes of session singer Tessa Niles, bass-playing maestro Pino Palladino, and long-time jazz sax virtuoso Dick Morrissey.

'I resent the press that I get now because it takes these people down with me. I'm used to people having a go at me for one reason or another – though it's normally 'cos they just don't like me and they see the next album review as another opportunity to have a go at me. That's normally fairly obvious when you read the review, so I don't tend to worry too much about it. But these people are clever, and they don't deserve it. If working with me means you're going to get a hard time from the press, then that's really sad, and more than a little bit depressing.

'When a bloke like Dick Morrissey says "Nice tune", or Tessa Niles says she's really enjoyed a session, it means a lot. I can say to Dick: "I want a solo here, you can do what you like with it". So he does what he likes and then I might say: "Could you make it a little bit sadder?", and he plays it sadder. He's brilliant.

'It's inspiring, working with people like that. I can walk into the studio with the barest framework of a song, and Pino will add his bit and it's there – you've got a song. It takes years to get to know an instrument like that.'

Following the success of 'Are Friends Electric?' came the traditional string of hit singles and best-selling LPs which, along with a couple of sell-out tours, built Numan a phenomenal, still loyal, following. The critics remained unmoved.

"I don't need This attention again"

Only when Numan announced his decision to quit touring – then subsequently went back on his word and returned to it – did the press sit up and take notice. Here was a classic rock star ploy if ever this Music Editor heard one. Yet listening to Numan speak now, it's obvious his aim was true.

'At the time it was a genuine move. I was sick of touring; I hated it and I didn't want to do it any more. The whole thing had got on top of me and I wanted out. I wanted to get back to how it was when I first started – I used to write at home on my piano, I could write what I wanted with no-one saying: "You gotta write this, you gotta have another number one, you gotta do a tour, you gotta do that". I was like a little boy who had run back to his mum. I didn't want any more of this business.

'It *was* genuine, and I didn't tour again for three years. Out of a four-year career, I don't call that an overnight decision to start playing again. I always thought I'd give it a couple of years, make a lot of money and get out. I saw people in there that were starting to enjoy it, but at that time, I didn't. I didn't like being on stage or touring, and I was nervous and embarrassed doing television.

'But I got to like it and you fall into a sort of trap. I started to enjoy being on stage and having people screaming at me. Once you're good at it you really start showing off, and then you're in trouble. I'm in trouble now – and I like it!

'But now I'm sensible enough to realise it won't last forever, and the saddest thing is that I'm better at it now than I ever was before.'

Yet in spite of getting more from music than he ever has before, Numan now has a second, equally important, love – aviation. This has provided the daily papers – as well as the music weeklies – with more ammunition than they could possibly have hoped for.

The most infamous flying incident involved Numan's arrest on suspicion of smuggling and spying during an attempt to fly around the world. The journey was a success the second time around, and this venture, along with several other scrapes with death in the cockpit, have had considerable influence on Numan's current outlook on life.

In conversation with Numan, it becomes difficult to separate the two apparently disparate issues, not least because the artist talks as freely as a pilot as the pilot does as an artist. The relationship between the two has provided inspiration for the musician and therapy for the aviator.

Numan explains. 'I find that I need both. If I wasn't able to fly I wouldn't be able to get away from the music business – and I need to get away from it regularly to keep my feet on the ground (sic) and remain objective about it. You can't make an important decision when the whole business is sitting on top of your shoulders like a bloody great millstone.

'But then you can only do display flying for so long before your nerves go. You know every time you go up and do a display that you're a little bit closer to the line than you need to be. If anything happens there's such a small margin for error, and then only for the experienced people who are very quick and skillful. So at the end of the season, although you love flying, you breathe a sigh of relief that you've got through another one, and you think maybe you've pushed your luck far enough this time.

'That's when it's nice to come back to the music business. You feel good, you feel like a man, you feel calm and intelligent and you feel as if you've achieved something, as opposed to anything you can do in the relatively protected world of music. People say that it's brave of someone to put out a particular single, but all he's going to do is dent his bank balance. That ain't brave.

'But both are challenges, both are rewarding, and I find that one feeds ▷

▷ the other.'

Numan claims the most productive source of inspiration for lyrics is experience, and who better to have a wealth of experiences to draw on than the pilot of an ex-World War II North American Harvard?

"I'd been surrounded for hours By the sound of thinking metal And I knew something was wrong"

'I find it difficult to write when the world is ticking happily by. It's much easier to write about the seedier side of life, a struggle or a fight or a hardship.

'In an aeroplane you can often be in a situation where you're very, very frightened – when you know something's gone wrong but you don't know what it is. You can just feel that something isn't right, you've got an hour to go before you land and you know something's going to happen. It's a horrible fear: to be *really* scared, you need time to think about it.

'Anything that is a problem is easy to write about, so I tend to write a lot about the aeroplane accident.'

When Gary Numan writes a song, lyrical considerations are usually preceded by musical ones, with the latter often derived from more modest origins than you might assume after hearing some of his most inventive, most successful pieces such as 'Cars' or 'We Are Glass'.

'Quite often, the title will come first and that will give me an idea of the mood of the song. How that all comes about I really don't know. I sit down at the piano and just play, and sooner or later a song comes out of it. Sometimes I'll get an idea from an advert on television. I even got an idea off a lorry once. It was parked beside me, and the engine had a strange tickover which had a real good rhythm to it. I got home and sung the rhythm into my tape recorder until I got my LinnDrum out and programmed it into that. That's a bit unusual, but an idea can come from anywhere. It can be image, lights, music, lyrics. All you've got to do is have your mind and your ears open enough.'

Inevitably, things aren't always that straightforward. Numan confesses – as if it were some kind of sin – to occasionally succumbing to the temptation of composing around a synthesised sound, allowing it to play a sizeable part in the creation of a song. But does that really make him guilty of anything a classical pianist isn't? Maybe it just makes him more aware...

'A sound itself can be quite inspiring. Just finding a sound can give you two or three songs, because a certain sound can lead you to write something you hadn't thought of before.

'That happened a lot on *The Fury*. Sometimes I'd be in the studio with the basis of a song, and a sound would come out that would dictate entirely rewriting that particular song. Now, I don't know if that's pure songwriting or not, but no matter where it comes from, if you get a song that people like and enjoy, then that's all that should matter – though I believe there are purists who would say that sounds shouldn't dictate the song.'

Not that Numan worries overmuch about his songs anyway. It's refreshing, at a time when songwriters are becoming increasingly obsessed with their own egos, to find a musician who doesn't consider his own opinion important enough to be foisted on the record-buying public.

'I see the songs as a diary more than the spouting out of a message. I think that to have something you want to say, you have to be interested in peoples' opinions, and I'm not. I don't want to change them. I don't mean that in a cold way, I just don't see music as anything more than entertainment. I never have.'

"Look at me I got the screams

'It's show business, it's glamourous, it's meant to be glossy, and that's the front I've put on. I go on stage with all the lights, do my bit, and it's fun. I don't take it that seriously, but I do enjoy it very much. I don't think the "being famous" bit makes *you* important. I don't think it makes your opinions important and I don't think it means that, because people ask you a lot of questions, it necessarily means you know what you're talking about.

'The business thrives on characters. It needs them to maintain its image of being outrageous, to make it interesting for the young and less acceptable to the old.

'We need people like Boy George and Toyah. I love the way Duran Duran shoot their videos on yachts to

show that glamour. That's why I got into it, for the glamour, for the money, for that sort of life. That was what I wanted, and anyone that doesn't is an idiot!'

Hmmm. Some things never change. Right from the start, Numan was more interested in being an entertainer than in being an artist.

Sadly, the press mistook his distinctive presentation and gloomy, hi-tech arrangements for an attempt at some sort of social comment on the coldness of our times. In reality, Numan only elevated synths above guitars because it seemed a good idea at the time, and still feels most of the ingredients in his chart-conquering recipe got into the cooking-pot more through luck than judgement.

'I put anyone's success down to luck – though not entirely so. You can write the greatest song in the world, but if nobody'll play it nobody's going to hear it, and where does that leave you? It leaves you sitting at home writing another great song, that's where it leaves you.

'But somebody can write a pretty average song, and if a DJ decides that he likes it and plays it to death, then you're in. People will like anything if they hear it enough – Christ, there are some things I hated, but if you hear them enough, sooner or later you go out and buy 'em!

'That's why radio is still the most important thing, and that's why, because they won't play my stuff now, I'm drowning. I'm dying. I'm standing on my own two feet, but I'm dying...

'I only found out about synthesisers by accident. It was when I found a MiniMoog left from the session before me in a studio. So I tried it to see what it sounded like, and it sounded great – that big, heavy MiniMoog sound that's so popular. It could have been that when I tried it, it would have made a silly noise and I'd have thought: "I don't like these very much". Then I'd never have touched them again! So it was luck that it was there, and it was luck that the sound that was set on it was one that I liked. Though slightly to my credit, I did see that there was an opportunity to capitalise on the situation.'

And capitalise he did. But one of punk's strengths was 'live' performance in the traditional guitar, bass and drums sense of the term, so a return to a keyboard sound brought with it visual problems that could have denied Numan the pop audience he sought.

"How I survived God only knows I don't like the memory"

'I realised that the synthesiser wasn't a very visual instrument, and that if I was going to become successful using it, I had to present it in certain ways. So that was why I became very image-conscious. All those things, some thought-about and some lucky, came together for me. It was a very lucky combination.'

Lucky or not, once the synthesiser link had been made, Gary Numan's name became synonymous with it. In the light of this, it came as something of a surprise when, two years ago, he told E&MM of his reluctance to become involved with complex, higher-tech machinery.

'I used to be very anti-computer synths, which was very ignorant and very stupid. I used to think searching for a sound on an analogue synth made it one of the most human instruments of all. You had to search for the specific sound you wanted, not accept the sound it offered like a guitar or a piano. But when computer synths first came out, I thought: "Christ, it really *is* getting to be just like pressing buttons now". It was taking the human factor out of synthesisers.

'Then I stumbled across the Wave Team (Mike Smith and Ian Herron, a programming partnership) with their PPG, and I was impressed. I still don't think I was *entirely* wrong, because a lot of what you do is hit or miss and people don't particularly search for things, but computers do give you the opportunity to search deeper for a sound, should you chose to do so. But either way, interesting sounds come at the end of it, and the music should be better because of it.'

The Fury uses the combined talents of the Wave Team and their PPG Waveterm to realise its tight, highly-textured feel. But Numan delivers another surprise when he announces that the keyboard line-up for his recent tour (the umpteenth in the last three years) consisted simply of five Roland JX8Ps (four and a spare) plus two old ARP Odysseys for the sounds the Rolands couldn't manage. What accounts for this further modesty?

'The current advances in technology are incredible. The speed at which things change and improvements are made is beyond belief. It costs so much to update equipment like the PPG that you have to be able to guarantee a certain amount of use for it before it becomes a financial practicality. I didn't want to get involved in that particular rat race, so I found it easier to hire one in for studio work. Now I've got an arrangement with Roland that I can borrow stuff for the tours in return for a bit of promotion.

'I was thinking of hiring a couple of PPGs to take out but I decided on the JX8s, partly because they gave the sounds I wanted, and partly because I'm still a little bit anti-computer synths in that I'm not sure they'll stand up to the rigours of touring. The trouble is that you put all your eggs in one basket. With my system, the instruments *are* less sophisticated, but they're sophisticated enough for me to get the sounds that I need.'

And on the age-old controversy between backing tapes and sequencing, Numan is typically objective.

'I use a bit of sequencing off-tape because, to me, there's no difference between that and a sequencer. Again the purists may kick up a fuss, but if you press a button and machines play a sequence, there's no difference whatsoever between them. You ain't playing it, and that's all there is to it. What does it matter what the retrieval system is?

'We don't hide our tapes when we play. They ensure the show goes on without making it any more or less human. I think it's entirely down to the performer and his audience: as long as they're both happy with the situation, then it's entertainment.'

Numan seems intent on continuing his career for as long as possible. For a man who's suffered at the hands of the press, risked his life in pursuit of his interests, and still come up with some sparkling, invigorating synth music, it'll be a shame when retirement finally beckons. But as he says:

"This could be
My last song
Everything must end some day"

(Lyrics published by Numan Music)

CXtensions

With a recent dramatic drop in price and the arrival of some ancillary hardware, Yamaha's CX5M is back in the music computer limelight. We look at three new software packages that aim to keep it there.

Software 8-track Real-time Sequencer
Designed by Digital Music Systems
Reviewed by David Ellis

Many moons ago, when *Star Wars* was confined to the sanity and safety of the big screen, and attaching the tag 'music computer' to an MSX micro was thought to be a good marketing ploy, it was being touted around the programming fraternity that if you made all the right noises about Yamaha and their CX5M, you might just get a look-in on the software development.

And even given the high price attached to the computer's UK materialisation, life generally boded pretty well for the CX5M. With its self-contained FM synthesis capability and built-in MIDI, programmers have been attracted to it like bees round the proverbial honey pot. But there have been problems.

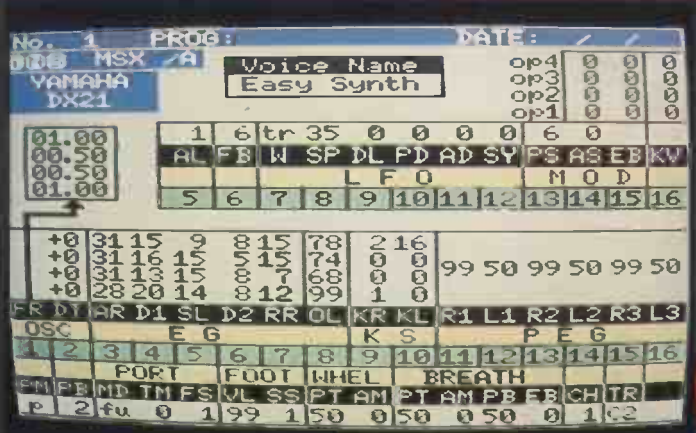
For a start, there was the unfortunate fact that the proposed MSX disk drive would be vying for the same memory space as software routines concerned with shifting data between the MIDI, the Z80 processor, and the SFG01 FM synthesis chip – the so-called "music BIOS'. That meant none of the initial release of software would work with a disk drive.

Then people started questioning what was preventing the CX5M from being used as a MIDI expander module. And why the FM Composer and Voicing cartridges wouldn't work with a DX7 connected to the CX5M's MIDI In.

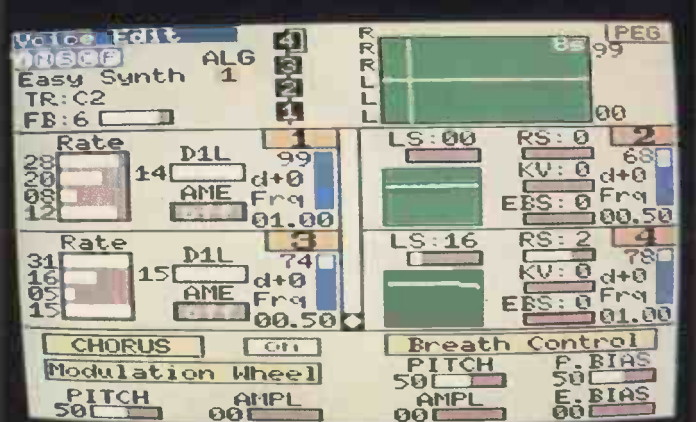
Finally, when Yamaha's own real-time MIDI sequencer software seemed to be subjected to some massive conceptual DDL, it wasn't long before CX5M owners started feeling a little disenchanted with their investment.

The root cause of a lot of this has been the way the inner workings of the CX5M have always been jealously guarded by Yamaha. What goes on in that mysterious music BIOS has been forbidden territory for all but the very few to pass Yamaha's positive vetting procedure. The nearest you or I could get to appreciating what made the CX5M tick was a set of four thick folders containing all the entry points needed to use the music

Documentation
'With a meagre 11 pages measuring just three inches square, the manual has to be my Guinness Book of Records nomination for the meanest ever.'



Screen examples *of Yamaha's DX21 Editor*



Sequencing *with the DMS real-time software*

BIOS routines – but not, of course, listings of the routines themselves. Yet even this was available only on special demand from Yamaha UK, and then only in the form of a sort of hi-tech chain letter which required you to remove your name from the top of an accompanying list of names and addresses, copy all the bumpf, and then send the folders on to the next name on the list...

Still, details of what the music BIOS gets up to are now emerging at last, albeit in the form of various discreet asides made by Yamaha employees in the States. For instance, according to Jim Smerdel of Yamaha International Corporation, the problem relating to using the CX5M as an expander module is that 'the software routine (in the music BIOS) used to communicate with the synthesiser chip takes so long to do its work that bytes of incoming MIDI data can be lost'. And the result of this sloth? Well, various companies in the States have offered to rewrite the CX5M's music BIOS to get around this further example of MIDI delaying tactics. Sad to say, Yamaha are sticking to their guns of non-disclosure.

Considering all the mystery and intrigue that's collected around the programming side of the CX5M, and a worldwide MSX takeover that's taken place with all the action and verve of a Japanese tea ceremony on a wet Monday afternoon, it's hardly surprising that software packages independent of Yamaha's haven't exactly been thick on the ground.

In fact, the Real-Time Sequencer from UK firm Digital Music Systems is the first to have made its way into commercial reality from any of the more musically-aware members of the European Economic Community.

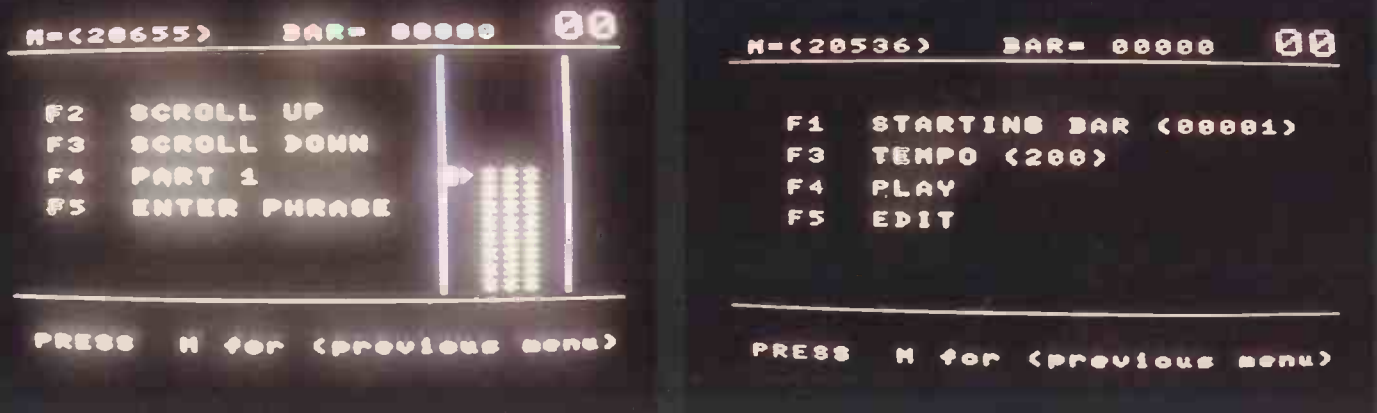
Overdubs *'No attempt is made to use the CX5M's decent graphics to show how phrases and parts knit together – so you're very much left blind.'*

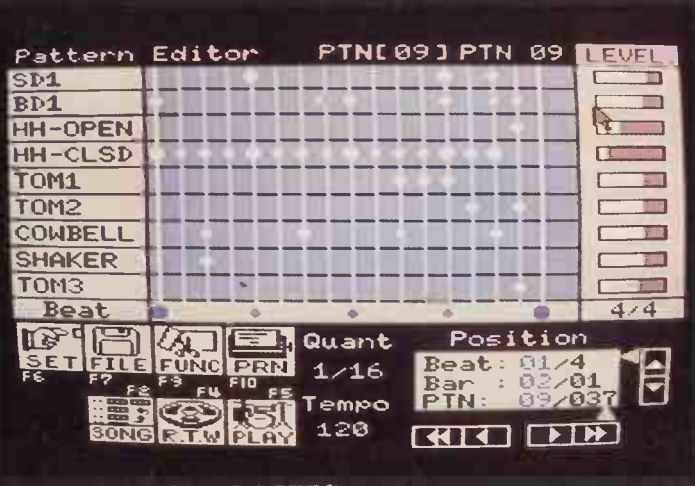
The CX5M is currently battling on with a much-reduced price tag of just £299 for the small keyboard version with one software cartridge (hints of a DX9-like stock clearance methinks; is it to make way for the forthcoming CX7M?), and there have also been some generous discounts to schools, so it might just be that the combination of a new pricing policy and the DMS software is just what's needed to give a flagging horse a much-needed boot up the backside.

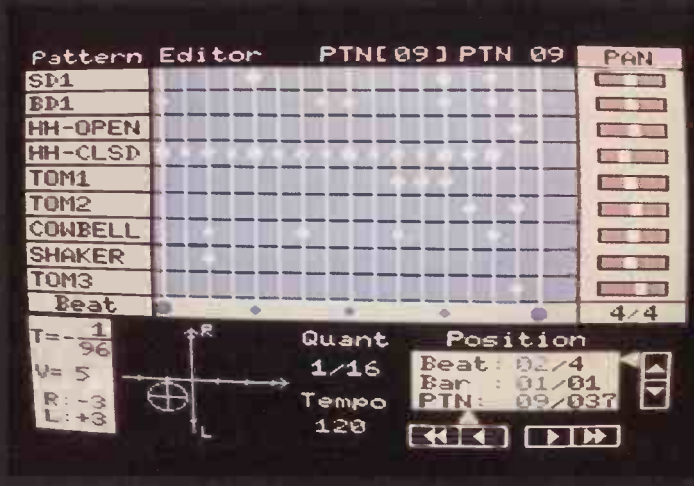
Anyway, the DMS software package stems from the joint work of CX5M owner and programmer Abdul Ibrahim, and Sounds Great, one of Yamaha's hi-tech retail outlets in Cheshire.

It seems Ibrahim was originally selected by Yamaha in the UK to develop some real-time sequencing software independent of Yamaha in Japan. But according to Phil Lyon of Sounds Great, Yamaha then lost interest in the real-time side of the CX5M because of the music BIOS problems, so Ibrahim was left to fend for himself. That was when Sounds Great became involved in the project, and the £84.95 cartridge currently on sale direct from DMS (and, ironically, also from Yamaha's other hi-tech dealers) is the eventual result of that collaboration, and a lot of hard work on Ibrahim's part in disassembling the problematical music BIOS.

As with Yamaha's own CX5M software, DMS' offering is contained in 16K-worth of ROM, in the form of a cartridge that plugs into the CX5M's cartridge socket. You're advised (wisely) to switch off the micro before you insert the cartridge or swap cartridges. Of course, the major advantage of ROM-based software is that the software is up and running more or ▷







Graphic details *of Yamaha's RX Editor*

▷ less immediately, but there are disadvantages, too, as we'll see later

Accompanying the cartridge is what passes for a manual. But with a meagre 11 pages that measure just three inches square, this has to be my Guinness Book of Records nomination for the meanest manual ever. It's bad news for a piece of software costing £85, even worse news if you're new to the CX5M and sequencing, and downright ridiculous if you've been under the impression that the MIDI was some kind of dress length that had come back into fashion along with the umpteenth repeat of *Star Trek*.

Fortunately for those with their heads in lo-tech sands, getting into the sequencer's range of activities is pretty straightforward, thanks to a menu-driven scheme that gets you where you want to get to with the minimum of fuss, with the help of some clear (though not inspiring) screen displays and the CX5M's five function keys. So for instance, the title menu offers five options: time signature (F1), Playback/Edit (F2), Record (F3), Load/Save (cassette or disk, F4), and Sync (internal or MIDI In clock, F5).

Heading for Record first, we find a display with a top line showing the amount of memory left (20,536 bytes at the start), followed by the bar number and a beat counter. Under that, there are more function key assignments for setting the CX5M's music keyboard to one of the eight possible sequencer parts, the phrase number to be recorded (up to 254), the number of bars in that phrase (set by the user), and finally, the tempo and metronome volume.

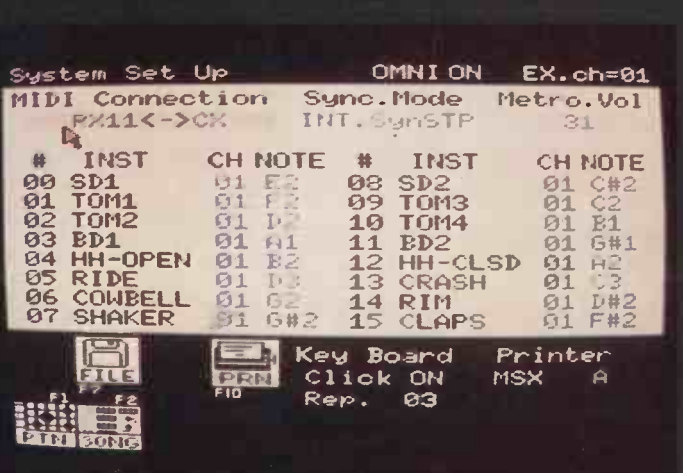
It's at this point that you turn to the manual to find out what 20,536 bytes equates to in terms of note events. It doesn't tell you. Justifiably niggled, you're then bemused why there doesn't seem to be anything reminiscent of a metronome emanating from the CX5M's internal speaker after you've pressed R for Record. The manual is no source of enlightenment there, either.

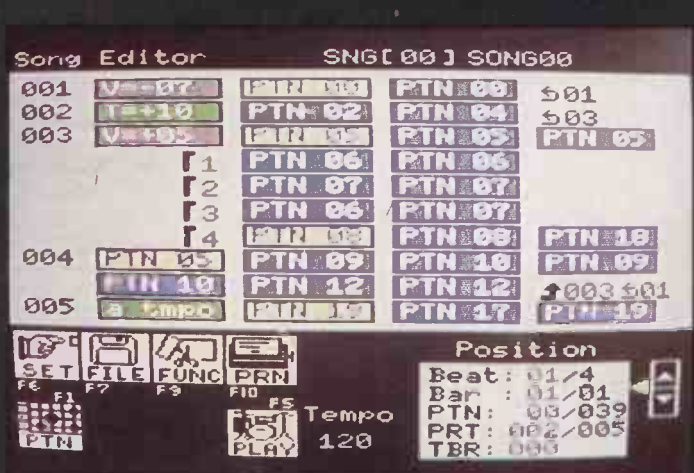
'Aha!' you cry, 'didn't DMS' advert mention Help screens?' Indeed it did, but for the life of me, I couldn't find anything along those lines in this software. In the end, experimentation seems to be the order of the day, and sure enough, connecting a phono lead to the CX5M's own 'sound' output reveals the metronome in all its square wave glory.

Another point that isn't mentioned in the manual is that the keyboard only comes alive once the eight-beat count-in is over. Personally, I prefer to play along with the count-in to get in time with the metronome, but perhaps that's a minority interest.

However, a more important point worth making at this juncture is that DMS' software is limited to the real-time antics of the YK01 or YK10 keyboards, not those connected via MIDI In. I'll repeat that: *not via MIDI In*. It's worth spelling that out, because it's certain that many potential purchasers will have jumped to the conclusion that DMS' package does what Yamaha's own real-time software prospectively does: take in event data via MIDI In. A direct consequence of this is that the only event data the DMS sequencer records is that pertaining to pitch and duration. Which means all the joys of velocity, aftertouch, program changes, and modulation wheels are absolutely verboten, as neither the YK01 nor the YK10 keyboard provides the means for sending that sort of extra-curricular expressive activity.

Still, 20,536 bytes filled with such simplistic event data does at least translate into a fair whack of notes, so maybe DMS aren't totally guilty of throwing out the baby with the bathwater. But as there's no scope for punch-in/punch-out correction of mistakes, or even appending to the end of a previously-recorded phrase, it's very much in your own interest to get it right first time.





What editing facilities exist in the DMS package (accessed in the Edit Phrase Data option) are a little on the primitive side, but the step-time pitch correction works well enough, and the auto-correction does what most people would expect of it within the limits of duration values between 1/4 and 1/48.

Having entered the raw phrases and patched up pitches and timing where necessary, the next stage is to proceed to the Edit Part Data option from the Playback/Edit menu. This allows you to assemble parts out of previously recorded phrases. Since democracy rules amongst parts and phrases, any particular phrase can be played by any particular part. Less enamouring is the fact that individual phrases can't be transposed within a part, though the overall part can be transposed relative to other parts. Also less than brilliant is the fact that the software provides no means for totting up the number of bars used in each part. To add to the list of deficits, no attempt is made to use the CX5M's decent graphics to show how all the phrases and parts knit together on all eight tracks. In fact, you're very much left blind when it comes to organising the contents of one part relative to another, so you'll need to be pretty well orientated in time and space (ie. not pissed) during your dealings with this software.

Finally, to get all the parts playing back with some sense of purpose, it's off to the Set Part Voices option to channel the parts to the CX5M's MIDI Out or the internal FM voices. Note that unlike Yamaha's FM Composer, DMS doesn't let you send a single part via both MIDI and to an internal voice at the same time. Shame really – I've always found

Voices ***'There are a total of 148 presets available for assignment to the eight parts, which I reckon to be generous by any standard.'***

that a good way of thickening some of the CX5M's less than thick voices.

In addition to the standard set of 46 CX5M voices, DMS provide their own set of 46, and there's still space for loading yet another 46 from Yamaha's FM Voicing software. That adds up to a total of 148 presets available for assignment to the eight parts, which I reckon to be generous by any standard. Still, I'd happily ditch 100 of those for the facility to construct and alter voices from within the context of the sequencer software, rather than having to go through the palaver of using the FM Voicing cartridge just to twiddle one envelope.

Jotting down my niggles with the way the software runs, I find quite a number – which is a bit worrying for a ROM-based package.

First, if you press one of the function keys (say, F2) instead of a numeric key (say, 2) in response to the request for a phrase number or some other parameter, the display comes up with the word 'auto' after the prompt. Similarly, F1 gives 'color', F3 gives 'goto', F4 'list', and so on. Now, pressing a function key isn't the most intelligent thing to do if you've been asked to enter a number, but it's the sort of thing anyone might do in the heat of the moment, and to be greeted by these strange words whenever you do is mildly off-putting. In fact, as anybody who's struggled with programming an MSX micro will know, the function keys also provide certain key commands ('goto', 'color', and so on) when you're programming in BASIC. The fact that these words appear in the context of DMS' software merely shows that the key-handling routines aren't as foolproof as they might be.

A similar sort of thing happens when you put together phrases to make parts. Here, the F2 and F3 keys get used to move the column of phrase numbers in front of what the manual calls a 'pink pointer'(!). Quite why DMS didn't use the CX5M's cursor keys for this purpose is beyond me, but my niggle is that the auto-repeat on these keys is so fast that just a slight touch sends the column to the top or the bottom before you know what's hit you, making it difficult to zero in on a particular phrase you want to change.

Then there's the annoying fact that if you keep your mits on the keys when leaving the Set Part Voices option for, say, the Record menu, the notes being played drone on through the count-in until the point where you're meant to start playing. And you can't blame that on a MIDI keyboard failing to obey an 'all notes off' message!

Finally, there's the curious paragraph in the manual (under the blindingly user-friendly heading of 'garbage collection') which suggests that all is not quite as it should be at t' mill.

This says: 'make sure that phrase one is the first that you record. However, do not ever allocate phrase one to any part, the reason being that phrase one is used by the system as a garbage collector for the system's own internal house-keeping.' There's also a line that suggests the user should make sure 'that the last phrase in any sequence is an empty phrase, ie. a phrase that is yet to be recorded'. That's messy and not a little confusing. In my book, garbage collection is something that goes on when all good little boys and girls are asleep, not in the broad daylight of a supposedly professional piece of software. Very strange.

Of course, quirks like the above aren't confined to home-grown software. Yamaha's FM Composer is a case in point, and many reluctant entymologists have served their apprenticeship discovering its idiosyncracies (like the tendency to drag its feet when overloaded with notes or sync pulses, for instance). That said, there's still very little at the low-cost end of the market that comes anywhere near the Composer's ability to accommodate variations on an expressive theme. True, if you go the whole hog and add variable accents, dynamics, articulations, velocity, vibrato, and program changes on every beat, you'll end up with a screen full of numbers and very few notes – not to mention a severely overtaxed Z80 chip and some very sore fingertips. But at least it's all there (well, most of it anyway) if you want it.

Sadly, Digital Music Systems' software veers too much in the opposite direction. It eschews expression in favour of simplicity. It also chickens out of using intelligent graphics to make its use more enjoyable by those musicians less than enamoured of the action of endless function keys.

To be fair, there's no doubt the DMS software adds another, much-needed string to the CX5M's bow, and one that's been sadly missing from Yamaha's currently available repertoire of ROM cartridges. The trouble is that viewed against the competition of other real-time MIDI sequencers, whether stand-alone (Korg SQD1, Casio SZ1 and so on), or micro-based (UMI 2B, JMS' 12-track Recording Studio, LEMI's Future Shock, or Syntech's Studio, to name but a few), the DMS package has a fair way to go before it attains the status of any of them.

If you've got a CX5M that's been lying low of late since you came to the conclusion that Yamaha's own highly-prospective real-time MIDI sequencer was just another example of Japan slipping off its continental shelf, then DMS' package should be just what you've been waiting for. The 400 names DMS already have on their order books show there are more than enough real-time-hungry CX5M owners out there prepared to part with what is only a moderately inflated price-tag of £84.95. For how long they'll put up with a package that provides no facility for coping with MIDI In data, let alone adding all-important expression, remains to be seen.

That's an unfortunate conclusion to have to reach, really, because the fact that Abdul Ibrahim has managed to sort out the ridiculous tangle Yamaha got themselves into with disk drives on the CX5M is a major point in the package's favour. Even so, at £399 for the Yamaha ▷

▷ disk drive and its interface, it's hardly likely that many CX5M owners will feel like availing themselves of Ibrahim's ingenuity. Indeed, they'd be foolish to do so when £399 can now buy you not only a 3.5-inch, double-sided, double-density disk drive like Yamaha's, but also a 128K CP/M-compatible computer, a monochrome monitor, and a printer that's capable of near-letter quality. The product is Amstrad's remarkable new word-processing package, and it's in your shops now.

Finally, DMS' software raises the thorny problem of what you do if you discover a bug in cartridge-based software. Sure, you can complain to the manufacturers, but as Yamaha's FM Composer software has demonstrated, it seems that once you've bought a ROM cartridge, you're stuck with it for life, warts and all. The DMS software clearly does have a few, admittedly minor, bugs in it.

I'd suggest DMS include a software update facility in the package's purchase price. After all, surely it's better to have satisfied customers than to add to the CX5Ms (and attendant software cartridges) that are up for sale in E&MM's classified ads? ■

Software DX21 Editor Designed by Yamaha Reviewed by Simon Trask

Let's consider, for a moment, the sort of job a typical Editor program should do. Put simply, an Editor is an alternative way of presenting patch parameters, which takes advantage of the fact that a monitor screen is capable of displaying more things more clearly than yer average LCD or LED display window.

The idea is that, by being able to see all the parameters and associated values of a synth patch, you're more likely to appreciate what the components of the sound are and how they interact. Which, in turn, should help you change things around to get the sound you want more quickly.

This approach has become even more useful in recent years, with the advent of digital access synths (which is most of them nowadays) that only let you edit one parameter at a time, and with the appearance of FM synthesis, which is *still* something of an unsolved mystery to many people, despite the fact that so many musicians now own a Yamaha DX synth of one description or another. If all synthesisers are novels, the Yamaha DXs could have been written by Agatha Christie. So it helps to be able to put all the characters up on-screen and find out where they all were on the night of the 14th, or whichever patch number you happen to be working on.

But let's not get too carried away. Just as a MIDI sequencer won't turn your monotimbral synth into a multitimbral wonder, so an editing program won't let you manipulate

Display *'The Editor scores well in the display category – the screens are clear and uncluttered, the choice of colours pleasing.'*

more than one parameter at once when the synth itself allows manipulation of only one.

Yamaha's DX21 Editor scores well in the display category. The screens are clear and uncluttered, the choice of colours pleasing (not a consideration to scorn if you're working at all extensively with software).

On power-up (the program is on cartridge), the Directory page appears on-screen, and the current contents of the DX21's RAM are automatically downloaded to the CX5M. The Directory page displays the names of the RAM voices, and besides numbering them, divides them visually into the DX21's eight-voice banks. There are six of these, which the alert among you will realise makes 48 voices. Seeing as the 21's RAM consists of 32 voices arranged in four banks, this arrangement seems slightly odd at first. However, the extra voice positions are useful, as the Editor allows you to move single voices around to any position and swap banks around with gay abandon. Only the first 32 positions converse with the DX21 over MIDI, so the extra positions are quite useful as 'safe' areas.

Changes made in voice positions within the Directory are not instantly transferred over MIDI. You have to go to the File page (all pages are accessed by pressing the CX5's Function keys) and select MIDI in order to instigate loading and saving of voice data over MIDI. Sensible enough.

There are two pages for displaying voice parameter data, though one of these is for viewing and printing out only; this presents the information in the standard data sheet format found in the DX21's manual.

The other screen is where parameter editing is carried out, and this presents a selection of the parameters in a neat, logical, and easily accessible layout. As you'll see from the accompanying photos, midscreen is taken up with envelope, frequency and output level parameters for each of the four operators. Information which is not operator-specific appears in the upper and lower portions of the screen, and it's here that you can flip between different displays (eg. between LFO and Pitch Envelope Generator parameters in the upper portion of the screen). Usefully, you can flip between parameter groups from the QWERTY keyboard, so there's no need to use your DX21's front panel at all.

Parameter changing can be accomplished either from the DX21 or from the CX5M's QWERTY keyboard, with changes registering instantly on both the synth display and the monitor screen. Movement around the latter is achieved with the cursor keys (the currently selected parameter is highlighted by a flashing cursor bar), while parameter value altering is achieved with the Home and Delete keys (these also function as Yes/No selectors). All of which makes on-screen access a quick and painless affair.

Most of the multi-value parameters are presented in either of two forms: as horizontal bar-graphs or (in the case of volume/timbre and pitch envelopes and rate scaling) as x-y axis graphs. These can co-exist on the screen quite happily, so one operator's envelope could have a bar-graph display and the other an x-y display simultaneously, and you can flip between one and the other at any point.

In most other respects, the DX21 Editor is restricted – as all editing packages are – by the information the host instrument can transmit/receive over MIDI. Thus, for instance, the program can upload all RAM data automatically from the DX21 on power-up, because the 21's MIDI implementation lets it receive a 32-

Features *'The 21 doesn't transmit performance memory data, so you're not going to find a performance memory save/load feature on the Editor.'*

voice dump request, upon which it transmits all the relevant data. But equally, the 21's MIDI implementation doesn't allow for the transmission of performance memory data, so you're not going to find a performance memory save/load feature on the Editor.

Regardless of MIDI, though, editing software can offer an increased number of storage possibilities, taking advantage of the peripherals normally associated with a general-purpose computer. So whereas the DX21 on its own is limited to cassette storage, it's possible via the CX5M to store voice data to disk, cassette or data cartridge.

Yamaha's own disk drive is now

available at last, and uses the now standard 3.5" disks, available from all good computer stores (as the saying goes). But the drive itself is expensive enough to cause a minor epileptic fit in those susceptible to them, and the Editor package allows you to save only 32-voice dumps to disk. Still, with a 720K formatted capacity, you should be able to get a fair few dumps on each floppy.

If you want to use cartridge storage, you'll need Yamaha's cartridge adaptor (£19), which lets you make use of the CX5's second cartridge slot while the first is occupied with the Editor. Unfortunately, the cartridges themselves cost – wait for it – £65. Considering each cartridge only takes a single 32-voice dump, this option sounds even less feasible than going for disks.

Cassette storage also allows you to dump a whole set of 32 voices – though given the slowness of tape storage, it would have been quite nice to have been able to do bank dumps as well. MIDI storage is, obviously, to/from the DX21, and again deals in complete 32-voice dumps.

Storage problems aside, the DX21 Editor is an attractive alternative to fumbling around with the synth's own meagre display. There's just no comparison between the comprehensive, informative CX5M displays and the DX21's front panel, nor between the ease with which you can move around the edit screen and alter values on the CX5M, and the tedious button-pressing you have to do on the synth.

FM is *still* like Agatha Christie. But at least there's a film version now, not just a book. ■

Software RX Editor Designed by Yamaha Reviewed by Trish McGrath

Just as keyboard players the world over have been heard to mutter 'what ever did we do without touch sensitivity?', so owners of RX11 drum machines and CX5M computers will soon feel the same about Yamaha's new RX Editor. Because the Editor will literally reach parts of the RX you never knew existed.

The program allows you to create patterns in step time from the CX5 or a MIDI keyboard, or in real time from an RX11, RX15 or MIDI keyboard (preferably a velocity-sensitive one). And it offers extensive editing facilities in both pattern and song modes.

If you connect an RX11, the Editor automatically downloads the data contained in the drum machine for editing or further programming (note that the RX15's MIDI implementation doesn't allow for the downloading of data in this way, contrary to what the handbook says). And the program *is* compatible with the budget RX21 (set the 21 to Channel Info Avail), with the same facilities as offered to the 15, other than the ability to edit instrument pan positions.

In fact, I see no reason why the program shouldn't be compatible, at its most basic level of triggering voices with some degree of dynamics, with any MIDI drum machine whose voices are accessible in this fashion, like the TR707/727, Drumtraks, and so on.

First off, the System Set Up menu requires you to select which one of four configurations the computer is dealing with, ie. either RX11 or 15, both either with or without input from a MIDI keyboard. From here, you can select Omni On/Off, the System Exclusive MIDI channel number, the channel number for each instrument, and the MIDI key note relating to each instrument. Synchronisation defaults to the CX's internal clock, but you can set the Sync Mode to accept or send the MIDI Clock if need be. For printing out screen displays, you can select between MSX and Epson printers, and set the speed (Northern Line crawl to Ferrari race) at which the cursor moves round the screen.

Each of the four main menus, Pattern Editor, Song Editor, System Set Up and Filer, are selected by pressing either a function key or moving the cursor to the appropriate icon and pressing Return, while most of the settings and values are selected by moving the cursor to the desired area until that area starts flashing; you select a new setting using the Home (−) and Delete (+) keys. Before long, moving around the Editor becomes almost second nature – and no doubt the optional mouse makes this quicker still.

Let's assume a certain familiarity with the spec of the RX drum machines, and go straight to the Pattern Editor. This is where you name, define, create and edit patterns using the now tried-and-tested grid. This makes room for eight instrument names and 18 steps before it scrolls down and across as need be. So if you tend to write multi-bar patterns, you'll have to do a lot of scurrying across the screen inputting and editing notes – though you can escape from the grid (by holding the Shift key down) without having to scroll to its extreme.

During playback, you depend very much on the beat counters to let you know where it's all at, as the grid is a bit of a non-scroller. Fortunately, the counters indicate the current beat and bar during playback, with an arrow moving, and a couple of dots blinking on and off, in time with the beat. And aside from a tempo indicator, a useful seconds counter runs with the pattern or song chain.

Creating patterns using the QWERTY keyboard is a matter of defining the time signature, number of bars, and quantisation necessary, compiling a list of instruments from a pull-down menu, and pressing the space bar at the steps where you want instruments to sound.

If you're inputting from a synth, you use the cursor keys to home in on a step, and then strike the appropriate note. Which is a bit slower, but has the advantage of allowing dynamics to be programmed at the input stage, provided your synth is velocity-sensitive.

In Real Time Write (RTW) mode, the space bar sets the metronome running, and input can be from either the RX or a synth. Once you ESCape from RTW input, your pattern is displayed on the grid for you to play back what you've written or edit further. Deleting a misplaced note is carried out by moving the cursor to that step and pressing the space bar a second time, or in RTW by pressing Shift and the instrument button in time with the offending notes – easier said than done.

The Instrument Function menu lets you delete an instrument from a pattern, delete just the notes that instrument was deemed to play, copy the notes of one instrument into another, and move the order of instruments around within the grid.

Meanwhile, the Pattern Functions operate on the pattern as a whole, and allow you to clear all the notes (leaving just the instrument names), clear the complete pattern (from whence you can redefine it and start from scratch), recall the state of the pattern prior to using the Editor, and copy or append another pattern to the present one. And in case your fingers slip, each and every selection can be 'undone' afterwards – so don't panic.

Right of the grid is the Pan/Level/Instrument display, which cycles to indicate the pan setting of each instrument, the overall level for each instrument,

Features ***'RX11 owners can set the velocity of each note played by each voice – a real feel-injector of an option if ever there was one.'***

and, in the case of the RX11, the instrument tone selected. You can edit all those parameters at will, too.

What else can the Editor do that your drum machine alone can't? For one thing, the velocity of *each note* can be set over a range of 1-8 relative to the level set for that instrument. This is a real feel-injector of an option if ever there ▷

▷ was one, and is especially good at instilling life into hi-hat patterns. And cleverly, the graphics indicate the volume of each note by increasing or decreasing the size of the dot that represents it.

If you home in on a note and press Return, an expanded diagram (reminiscent of a miniature Golden Shot) appears bearing details of the velocity, timing, and pan settings for that note.

Pronunciation Timing is the term given to the movement of a note forwards or backwards in time in intervals of 96th-notes (maximum is 2/96 before and 3/96 after the beat), which, if you use it wisely, can simulate yer average 'human' drummer after 10 pints of Kronenbourg.

For RX11 owners, the Editor allows you to stipulate the pan position of each note for each instrument – great for autopanning tom rolls and other marvels of stereo migration – and during playback, the pan indicators jump about like jack-in-the-boxes. Very entertaining. However, it's worth pointing out that the range of +/–7 is relative to the position of the *previous* note, which means the expanded diagram can be somewhat confusing. For instance, if the display indicates 00 placement, it doesn't necessarily mean the sound is centre-panned – it's just that there's been no movement from the previous note's position. It also transpires that the maximum movement you can achieve between two consecutive notes is 7 units, which works out at half the stereo image. But then, who in their right mind would want to pan hard left and right in consecutive steps? Well, I might for a start. OK, so it can be disorientating, but Yamaha might at least have given us the choice.

Bear in mind, also, that the individual outputs from the RX11 are mono only, so you can only enjoy the innermost delights of this feature when the stereo outs are in use.

But pattern editing isn't the only area where the Editor offers extra facilities. The Song Editor does more than the usual linking of patterns.

For instance, after naming a song, you're free to link patterns together to form a song chain, which you can divide down into parts, and then play back either the complete song or just individual parts. Pattern input is made from another pull-down menu that displays the list of defined patterns and the various editing options available. While you're arranging your patterns into parts, you can place repeat signs on a part (from 01 to 99 repeats); instruct the chain to return to some previous part (the first time round) and repeat it a number of times (again, from 01 to 99); and insert parentheses in the chain, in which case the part is repeated until all the different endings have been played.

You can also instruct the song to adhere to the level balances set for each voice in a pattern, as well as the RX11 instrument tones set (so you can change from one snare or bass drum tone to another). This is best done before the first part in a song chain, as otherwise the Editor defaults to whatever levels and instrument tones were used in the last pattern played. Pan settings and velocity adjustments inherent in a pattern are always followed, though, as is individual note panning in the case of the RX11.

Moving to the song as a whole, both tempo (+/–50 units) and overall volume can be altered (in the range +/–15 relative to the present level) in the middle of a song. However, I'd award a medium-sized Golden Turkey to the latter feature. The volume of the RX can be altered in a range of 0-63 – but the default value in the software is the maximum of 63, using a scale different from that used by the drum machine. This means that if you want to increase the volume in the middle of a song, you've got to set it to –15 to begin with, and increase it relatively from there. So instead of getting a dynamic range of 30 units, as you might think, you actually get one of 15. Which is a bit silly, really.

The Song Function menu allows for the clearing of a song, recalling the state prior to use of the Editor, copying a song to another location, and appending one song to another.

You can also send MIDI macro data, created by Yamaha's FM Music Macro software and loaded in advance from the Filer, between patterns.

In case you hadn't already guessed, the Filer is where all saving and loading is carried out between the CX5M and RX11, cassette, disk drive, data cartridge, the Watford Public Library, or any other storage medium you succeed in connecting. It's also where you're given the option to clear the entire contents of the Editor from the Function mode.

As mentioned earlier, you can't dump data directly to or from the RX15 (you can use Real-Time Write mode for the transfer of individual patterns from the RX15, but it's a bit laborious), so you'll need one of the other devices for storing and retrieving data. Which is no bad thing, really, since most of the extra features the Editor offers are eliminated once data is compressed for sending back to the RX11. So be prepared to build up cassette or disk libraries if you want to enjoy the additional features the Editor offers.

Storage *'You can't dump data directly to or from the RX15, so you'll need one of the CX5's storage media for storing and retrieving data.'*

Our resident RX15 worked to rule during the test period, and refused to follow the pan positions set by the Editor (the software, not the man with the red pen behind his ear). Even giving Yamaha the benefit of the doubt, it still seems crazy to expect people to use the CX5M and associated hardware for creating and storing patterns, and then have to lug the whole circus with you to rehearsals and gigs. No more jumping on the tube with your RX15 under your arm...

All of which leaves me thinking the package is best suited to RX11 owners and brave RX15 users.

It's worth remembering that from the Set Up page you can set each instrument to a different MIDI channel number and key note value, which does allow for the simple sequencing of external MIDI devices, like your DX7's timpani patch, a gaggle of SDS9 toms, and so on.

It's debatable whether RX users will invest in a CX5M for the added benefits the Editor offers, but for CX5M owners looking for a decent drum machine, an RX11 would be hard to resist, and an RX15 still a good bet.

Because when all is said and done, the RX Editor makes pattern writing and song creation a rapid, straightforward exercise, allows specific and comprehensive editing, and presents a set of graphics that's nothing short of superb. One day, all drum machines will be programmed this way. ■

DATAFILE

CX5M Software

DMS 8-track Real-time Sequencer

Hardware requirements *Yamaha CX5M, TV, cassette or disk drive*
Specification *1 song, 8 parts, 254 (max) phrases*
Main features *Real-time monophonic or polyphonic input from YK01 or YK10 keyboards, metronome, autocorrect, pitch editing, part transposition, part muting, part volume, CX5M or MIDI channel assignment, sync from external MIDI clock*
Price *£84.95 including VAT and postage*
More from *Digital Music Systems, 82 Wilmslow Road, Heald Green, Cheshire SK8 3BG ☎ 061-437 4788*

DX21 Editor

Price *£39 including VAT*
More from *Yamaha-Kemble, Mount Avenue, Bletchley, Milton Keynes, Bucks, MK1 1JE ☎ (0908) 71771*

Yamaha RX Editor

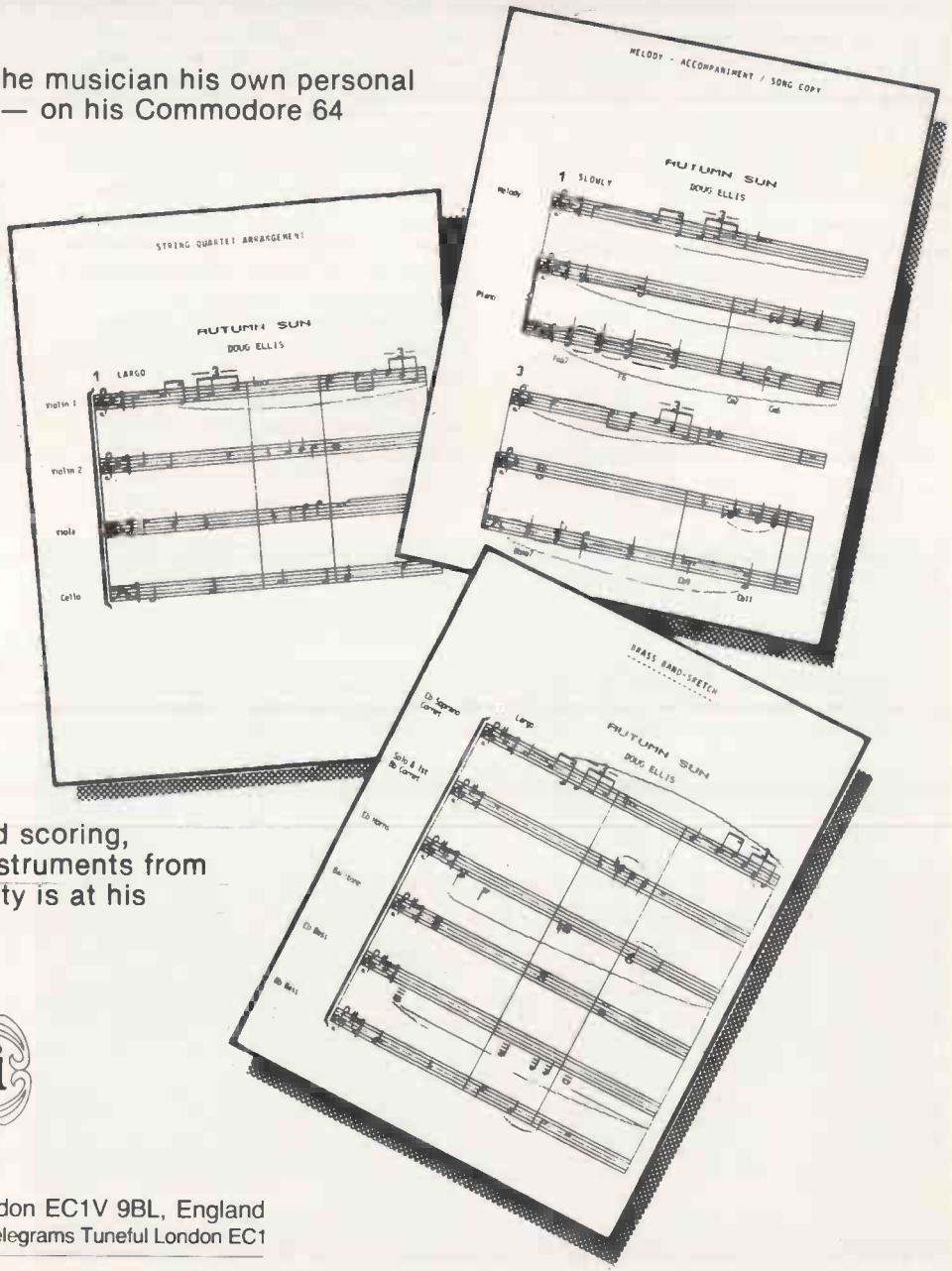
Price *£39 including VAT*
More from *Yamaha-Kemble, address above*

THE FORMULA 1+1=3

One SCOREWRITER plus one tune equals three scores or more!

The JMS Scorewriter brings to the musician his own personal staff of arrangers and copyists — on his Commodore 64 Computer!

Music is recorded "live" from a MIDI keyboard into the JMS 12 Track recording studio program (included free with the Scorewriter E-Prom). The appropriate tracks are then edited and printed in the format to suit virtually any musical purpose. Additionally each part may be extracted and printed separately — suitably transposed for any instrument. Up to six staves may be printed at a time — each containing multiple parts if required. A wide range of tolerances and parameters may be set.



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RAP attack

'Rhythm Activation Program' is the name given to the latest onslaught of British software genius. The company is MIDIsoft, the software is a must for MIDI drum machine users. *Simon Trask*

Way back in the history of MIDI, someone, somewhere had the bright idea of associating drum voices with MIDI pitch numbers. The idea was a pretty neat one, because it gave musicians the ability to play a synthesiser from a drum machine, and vice versa.

It's great fun, tapping melodies into a drum machine or using touch-sensitive keyboards to play percussion voices with dynamics. But this interaction also raises the possibility of recording rhythm patterns into a non-dedicated MIDI sequencer, either from a drum machine or from a synth.

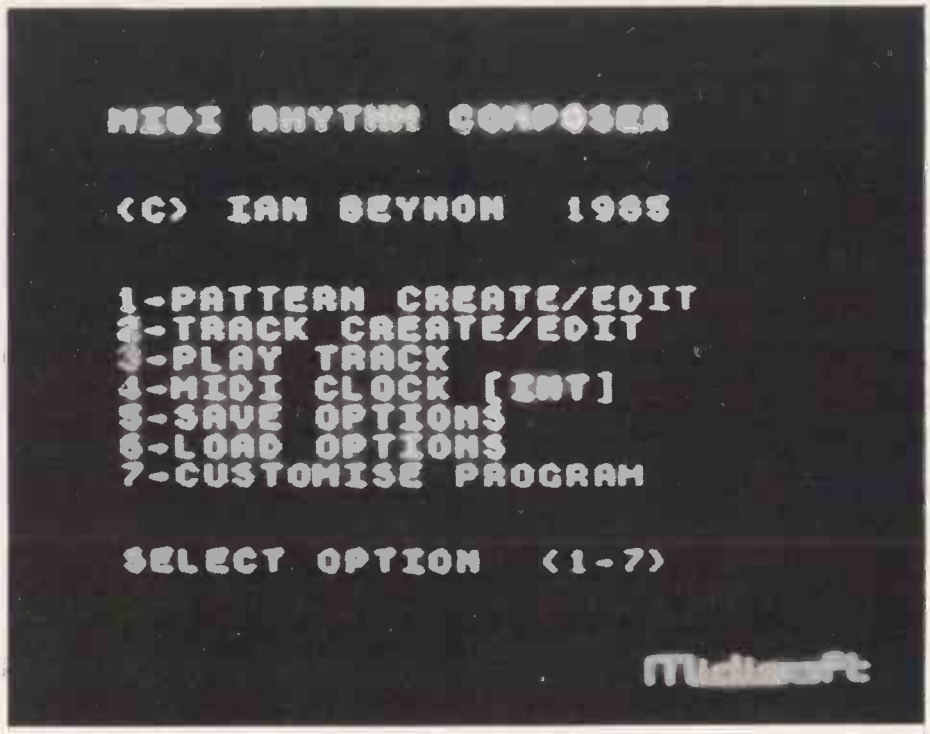
Now, some drum machines have fixed pitch-to-voice correlations, whilst others allow you to define your own. Either way, there's certainly no standard configuration, so a sequencer which allowed you to build up a library of such configurations which could then be imposed on any rhythmic sequence would obviously be very valuable – your drum patterns would be available for use with *any* MIDI drum machine.

Hey presto. British ingenuity comes to the fore once again in the shape of a software package called RAP (for Rhythm Activation Program). It's available for 48K Spectrum and Commodore 64, and can best be described as a centralised rhythm programmer that employs the same sort of matrix display as Roland's recent drum machines and Yamaha's RX editing software.

RAP allows 200 patterns to be created in step time from the computer's QWERTY keyboard – though sadly, you can't input anything over MIDI. The patterns are organised in two banks, and can be chained together in 16 independent tracks. Each pattern can be up to 16 steps/beats long, and use up to 16 voices playing concurrently. Each voice has its own MIDI channel number, MIDI pitch number and a maximum ten-character name.

The ability to assign a different MIDI channel to each line/voice of the matrix opens up the possibility of playing patterns on a hybrid system using more than one drum machine. It's equally feasible to incorporate synths and samplers into a rhythm pattern by virtue of the fact that it's MIDI pitch numbers that are being sent from RAP over MIDI – though as soon as you start thinking about pitches, you're faced with the headache of having to convert familiar pitch letters into MIDI pitch *numbers*.

Facilities *'Being able to assign different MIDI channels to voices lets you use a hybrid system of more than one drum machine.'*



Not being one to shirk from the reviewer's lot, I dug out TR707, RX15, RX21, DX7 and JX8P for a trial run under RAP's control, using both the Commodore and Spectrum versions.

And almost without exception, the program worked really well. The one problem to emerge was with the RX21, which made no more than rather sporadic attempts at responding to RAP's output. In all fairness, this might not be a problem with the RAP software itself. Whatever, MIDIsoft are now aware of the problem and are investigating further, so if you're an RX21 owner interested in RAP, get in touch with them before parting with the readies.

One point to bear in mind, though, is that a MIDI note-on period is limited to the duration ▷

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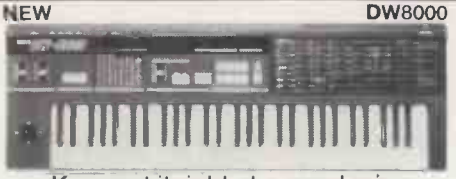

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▷ of a single step. Thus, where synth sounds are concerned, the duration of a note depends on the sound's release phase. Another noteworthy point is that it's not possible to enter triplets via RAP's step-time method.

But the most significant omission, given RAP's ability to include synths in its rhythmic excursions, is a facility for storing patch changes between patterns in a track. Were such an option available, you could switch from a marimba to a koto, say, between different patterns or two renditions of the same pattern.

The Spectrum version of RAP allows you to choose between six different interfaces: XRI Micon, SIEL, EMR, JMS, E&MM's own, and an obscure device marketed by a now-extinct magazine based in London's docklands. The Commodore version caters for a more modest selection comprising just SIEL and JMS.

The program divides broadly into three areas: pattern creation and editing, track creation and editing, and a third set of functions carried out by a customising editor.

Moving around the system is very easy, thanks largely to the appearance of helpful on-screen prompts at almost every stage. There are also Help pages for the pattern and track sections, which give an on-screen list of all the commands available for the specific section.

Writing patterns, which entails step-time input from the computer keyboard, is a fairly straightforward affair. You're presented with the above-mentioned 16-by-16 matrix, round which you move a cursor with the help of the, er, cursor keys. A joystick would have been swifter, and a mouse quicker still. All the same, the 'global' approach adopted by RAP, whereby you have the whole pattern in view at a time and equal access to any part of it, is a welcome feature that makes programming patterns quite straightforward.

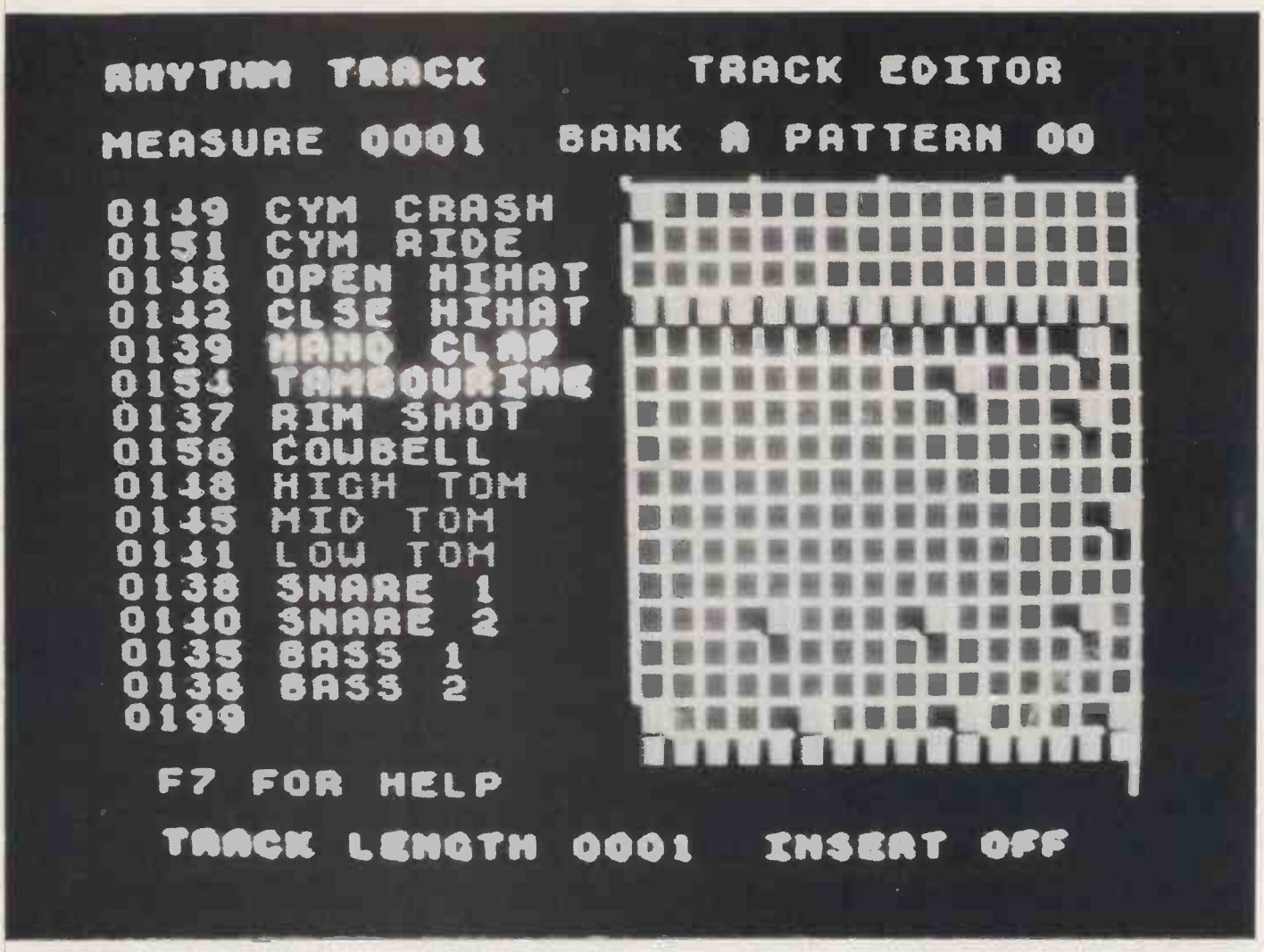
As you might have guessed from RAP's step-time nature, you can't input or edit a pattern while it's playing. However, you *can* start and stop playback at any point without affecting the stage your input's currently at, which minimises the transition time between input and playback.

Other facilities allow you to call up the adjacent lower and higher patterns, decrease and increase the tempo between 1 and 240 beats per minute (though not whilst a pattern is playing), set the last step in any pattern (from 1-16 steps, irrespective of how many steps you've actually entered), clear the currently-positioned line, clear the current pattern, copy the current pattern to any other position, and rotate the current pattern. This last facility rotates the whole pattern one position at a time to the right (the last beat becomes the first, the first beat becomes the second, and so on).

Dynamics handling is limited to an accent value (between 0 and 7) which can be specified for each step – but not each voice – in a pattern. Compared with the velocity resolution MIDI makes possible, this is obviously a bit limited.

In the case of an instrument such as Sequential's TOM, which assigns specific pitches to dynamic and tuning levels as well as to voices, RAP isn't going to be able to do the machine's capabilities anything like justice.

The track section allows you to chain patterns together to create up to 16 independent tracks, each of which may have up to 1000 links. Even allowing for the fact that there are no extra song construction facilities to reduce the number of links that need to be input, that upper limit is going to seem rather excessive unless you're writing a symphony. Maybe the program would benefit from having fewer links per track, and allowing several configurations to be resident in memory instead. What with the slow loading times that are part and parcel of using the Commodore disk drive, and the even slower ones inherent in cassette loading, this would be an especially useful feature.



Once you've selected the track you want to input or edit, you're presented with a screen not unlike that for pattern input, only here the pattern you choose for the current link is presented only for information purposes. Other information presented on-screen includes the current link number, the number of links in the track, and the status of Insert mode.

Facilities available (all accessed by single or, at most, double keypresses) allow you to auto-repeat through all 200 pattern numbers when selecting a pattern for each link, auto-repeat forwards and backwards through the links, go to the start or end of a track (but *not* straight to any link), erase an individual link or a complete track and toggle the Insert function on and off. With Insert off, entering a pattern automatically overwrites the currently-assigned pattern. With it on, the ▷

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▷ currently-assigned pattern is moved along one link to make way for the new pattern. Usefully, you can also fast-forward or rewind through a track while it's playing.

Problems? Well, because MIDIsoft have opted for an on-screen pattern display complete with customised information, there's no room left for a listing of the patterns used in a track. Unfortunate, but it doesn't detract from what is in all other respects an excellent display, and very accessible piece of software.

Unlike the pattern section, this one forces you to return to the menu and select a 'play track' option. But once you've made that selection, the option allows you to set both playback speed and the number of repeats. You can have between one and eight of the latter, which seems a bit stingy. An infinite repeat option would have been useful, too.

When it comes to loading and saving data, RAP offers a fairly flexible set of options. You can save pattern banks individually or together (but not individual patterns, unfortunately), tracks 1-16 as a group or individually, customised configurations, and all performance data. And the good news for Spectrum microdrive owners is that the Spectrum version can be converted to run with microdrives rather than cassettes.

RAP fulfils what is essentially an ancilliary function, and is most likely to be used in conjunction with a general-purpose sequencer. Fortunately, MIDIsoft have had the good sense to include an internal/external MIDI syncing capability. The system obviously benefits from the ability to function within a larger sequencing environment, or even a SMPTE-controlled one.

One annoying limitation – and this is where the eight-bit computers' limitations show up – is that if you select external clock, you lose the pattern display. The reason, in the case of both versions, is that the computer must constantly monitor for incoming MIDI timing bytes, with the result that there's no processing time for updating the pattern display.

But RAP epitomises the strengths of software devised for non-dedicated micros. It allows a central program to control any number of MIDI drum machines, gives users of all MIDI drum machines the sort of visual feedback previously only available to a few, and offers a very easy method of step-time recording.

Obviously, there's also tremendous value in having a central pool of rhythm patterns and sequences, which you can play on any MIDI drum machines with the appropriate customised pitch-to-voice configurations. Apart from the more obvious benefits, the advent of RAP means you could hire a drum machine for a day without having to worry about learning its programming intricacies – all you'd have to know would be the pitch-to-voice correlations, which could then be included in your customised library.

In Use *'The advent of RAP means you could hire a drum machine for a day without worrying about programming intricacies.'*

Even if you have only one drum machine, RAP still offers the attraction of a useful visual step-time entry system, and extensive pattern and song storage capacity – with the important added attraction that all your patterns and songs are instantly available should you buy another, more facility-laden drum machine at a later stage.

And RAP also provides a useful – though limited – method of incorporating synth voices into rhythmic patterns.

If all this sounds appealing and you take the plunge, you might find yourself having to buy a second computer on which to run RAP if you've already got a micro-based sequencer. This is where the ridiculously cheap Spectrum really scores – though it does mean you have to contend with the sluggish operation of tape or microdrive.

That sort of operational sloth will probably keep RAP – and a lot of other software written for cheap home micros – out of many professional environments like recording studios. Which is a shame, because a good deal of this software is actually more inventively written than that devised for more intelligent computers like the Apple Mac and IBM PC, or dedicated systems such as the Fairlight.

Expanding on the concepts RAP embraces in a package written for one of the above shouldn't prove too difficult, and the results could be staggering.

Until that happens, RAP performs several extremely useful functions, and performs them within a program that's for the most part clearly laid-out and easy to use. Its designers deserve credit for (a) having such a good idea in the first place, and (b) putting it into practice on limited, but affordable, home computers. ■

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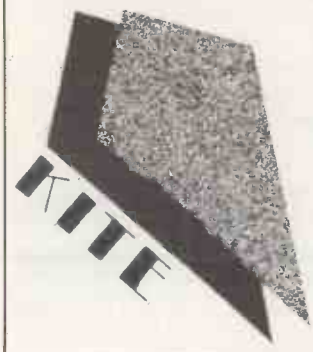

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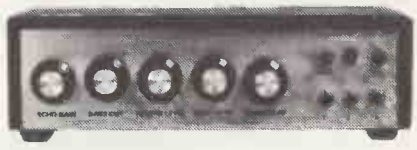

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1981

MARCH *Sold Out*

Music *BBC Radiophonic Workshop* **Appraisal** *Yamaha SK20* **Technology** *Using Microprocessors, Advanced Music Synthesis (VCOs, FM), DIY Spectrum Synth, DIY Hifi Sub-bass Woofer*

APRIL

Music *Warren Cann (Ultravox)* **Technology** *Using Micros Pt2, Programming Micros, Advanced Music Synthesis (PWM), DIY Spectrum Synth Pt2, Syntom 1* **Studio** *DIY DI Box*

MAY

Music *Tim Souster* **Appraisal** *Apple Music System* **Technology** *Using Micros Pt3, DIY Spectrum Synth Pt3* **Studio** *DIY Noise Reduction Unit*

JUNE

Music *David Vorhaus* **Appraisal** *Fairlight CM1, Yamaha PS20* **Technology** *Using Micros Pt4* **Studio** *DIY MOSFET Amp*

JULY *Sold Out*

Music *Duncan Mackay* **Appraisal** *PPG Wave 2* **Technology** *Using Micros Pt5*

AUGUST

Music *Irmin Schmidt* **Appraisal** *Resynator Synth, Casio VL1* **Technology** *Harmonics, DIY PA Signal Processor Pt1*

SEPTEMBER *Sold Out*

Music *Kraftwerk* **Appraisal** *Linn LM1* **Technology** *Using Micros Pt6, DIY PA Signal Processor Pt2* **Studio** *DIY Noise Gate*

OCTOBER

Technology *Using Micros Pt7, DIY Harmony Generator, DIY Effects Link FX1* **Studio** *dbx Explained*

NOVEMBER

Music *Landscape* **Appraisal** *Casio MT30, Roland GR300 and CPE800* **Technology** *Using Micros Pt8, Speech Synthesis, Phasing, DIY Auto Swell Pedal*

DECEMBER *Sold Out*

Music *Rick Wakeman, Orchestral Manoeuvres in the Dark* **Appraisal** *Yamaha CS70M, Vox Custom Bass & Custom 25, Roland CR5000 & CR8000, Elka-Orla X50, Vox AC30, alphaSyntauri* **Technology** *DIY Synclock* **Studio** *Fostex 250, ElectroVoice Mics*

1982

JANUARY

Music *Tangerine Dream* **Appraisal** *Casio 701, Teisco SX400, Aria TS400, MCS Percussion Computer, Passport Soundchaser* **Technology** *Flanging, DIY Spectrum Synth Update Pt1, DIY Volume Pedal* **Studio** *Beyer Mics*

FEBRUARY

Music *Ike Isaacs* **Appraisal** *Korg Trident, Roland TR606, Tokai ST50 and PB80* **Technology** *Polysequencing on ZX81, Yamaha GS1&2 (FM) Explained, Digital Delay Line Pt1, Spectrum Synth Update Pt2* **Studio** *Fostex A8, AKG Mics*

MARCH *Sold Out*

Music *Klaus Schulze, Robert Schröder, Kraftwerk 'Computer World' Music* **Appraisal** *Firstman SQD1, SCI Pro One* **Technology** *DIY Digital Delay Line Pt2* **Studio** *Tuscam 124AV, DIY Power 200 Speakers*

APRIL

Music *Martin Rushent (Human League)* **Appraisal** *Korg MonoPoly, Roland TB303* **Technology** *DIY MF1 Sync Unit* **Studio** *Fostex 350, DIY MultiReverb*

MAY

Music *Holger Czukay, Depeche Mode* **Appraisal** *Moog Source & Rogue* **Technology** *DIY Soft Distortion Pedal* **Studio** *DIY Quadramix*

JUNE

Music *Jean-Michel Jarre, Classix Nouveaux* **Appraisal** *Emulator, Carlsbro Minifex* **Technology** *DIY Panolo, DIY Multisplit*

JULY

Music *Ronny with Warren Cann & Hans Zimmer, J-M Jarre 'Magnetic Fields' music* **Appraisal** *Roland Juno 6, Peavey Heritage, Steinberger Bass* **Technology** *DIY Universal Trigger Interface*

AUGUST

Music *Kitaro, Jon Lord* **Appraisal** *Synergy, Korg Polysix, Shergold Modulator 12-string, Yamaha Pro-FX* **Technology** *DIY Guitar Buddy practice amp* **Studio** *Tascam 244 Portastudio, DIY 8201 Line Mixer*

SEPTEMBER *Sold Out*

Music *Richard Pinhas* **Appraisal** *Yamaha CS01, Jen SX1000, Casio 1000P, Fender Squier, Carlsbro Stingray, Pearl Effectors* **Studio** *DIY Comp-Lim & Twinpak*

OCTOBER *Sold Out*

Music *Kate Bush, Ken Freeman* **Appraisal** *Fender Vintage Series, Rhodes Chroma, Kay Memory Rhythm* **Technology** *Performance Controls*

NOVEMBER

Music *Patrick Moraz, Bill Nelson* **Appraisal** *Yamaha PC100, Technics SXK250, Casio MT70, Hohner P100, JVC KB500, Gibson Firebird 2, Alligator AT150* **Technology** *DIY Sweep EQ, Robert Moog* **Studio** *AHB 1221 Mixer*

DECEMBER

Music *Cliff Richard* **Appraisal** *Elka Synthex, Crumar Stratus, Tokai Basses, The Kit* **Technology** *DIY Canjak* **Studio** *Shure PE Mics*

1983

JANUARY

Music *Richard Barbieri (Japan)* **Appraisal** *Westone Bass, BGW 750C Amp, Korg EPS1, Clef BandBox, Zildjian Cymbals* **Technology** *DIY Synblo*

FEBRUARY

Music *Isao Tomita, Human League* **Appraisal** *Synclavier II, MemoryMoog, Novatron, LinnDrum, Simmons SDS6, Klone Kit, Movement Drum Computer 2, Korg KPR77, Powertran Polysynth, Vigier Guitars* **Technology** *DIY Synbal, DIY Caltune* **Studio** *Pearl Mics*

MARCH

Music *Klaus Schulze, Michael Karoli, Francis Monkman, Bernard Xolotl, Chris Franke* **Appraisal** *RSF Kobol Expander, Korg Poly 61, BGW 7000 Amp, Ibanez Pedals, Tokai Flying V* **Technology** *DIY Shaper* **Studio** *Aria Mics*

APRIL

Music *Naked Eyes, Gabor Presser* **Appraisal** *Casio 7000, SCI Prophet 600, ChromaApple Interface, Eko Bass pedals, Vox guitars* **Technology** *DIY Syntom II*

MAY

Music *Keith Emerson* **Appraisal** *Roland MC202, Carlsbro Cobra 90 Kbd Combo, M&A K1/B Kit* **Technology** *Introducing MIDI, DIY MicroMIDI (interface for Spectrum)* **Studio** *Fostex X15, Echo Unit Supplement (13 reviews incl Roland SDE2000, Fostex 3050, Korg SDD3000), DIY Active Speaker*

JUNE

Music *Steve Hillage, Arthur Brown* **Appraisal** *Synclavier II, Synton Syrinx, E-mu Drumulator, Vestafire Dual Flanger, Aria AD05 Delay* **Technology** *DIY OMDAC* **Studio** *Suzuki Mics, Clarion and Cutec four-tracks*

JULY

Music *Marillion, Hans Zimmer* **Appraisal** *Kawai SX210, Aria U60 Deluxe BBS, Deanvard VA30K Amp, MXR Omni FX* **Technology** *Yamaha DX synthesisers, Digital Signal Processing Pt1, DIY Tap Tempo* **Studio** *Milab Mics, Trident VFM Mixer*

AUGUST

Music *Bill Nelson, Hubert Bognermayr, Barclay James Harvest* **Appraisal** *Roland JX3P/PG200, OSCar, 360 Systems Digital Kbd, MPC Music Percussion Computer, Yamaha SG200, Fender 100W Stage Lead, Frontline FX* **Technology** *Digital Signal Processing Pt2*

SEPTEMBER *Sold Out*

Music *Peter Vettese* **Appraisal** *Prophet T8, Oberheim DX drums, SCI Pro-FX 500, Rickenbacker 360, 12-string & TR75 GT Combo* **Technology** *Music Composition Languages Pt1, Sounding Out the Micro Pt1, DIY Synclap*

OCTOBER *Sold Out*

Music *John Miles, Andrew Powell* **Appraisal** *Yamaha DX1, OctavePlateau Voyetra 8, SIEL Opera 6, MXR 185 Drum Computer, Ross Pedals, Fender Elite Precision Bass 1, Steinberger six-string* **Technology** *Sounding Out the Micro Pt2, Speech Synthesis, Digital Signal Processing Pt3, DIY Mains Distribution Board*

NOVEMBER

Music *Tony Banks, John Foxx* **Appraisal** *Seiko Digital Keyboards, Eko EM10, UC1 Sequencer for SCI Pro One, Doctor Click, Klone Kit 2, Ibanez HD1000, Korg KMX8 Mixer, Ibanez RS315SC Guitar* **Technology** *Music Composition Languages Pt2, Software Envelope Generator (ZX Spectrum), MUZIK 81 (ZX81), Digital Signal Processing Pt4*

DECEMBER *Sold Out*

Music *Gary Numan, Psychic TV, Philip Glass* **Appraisal** *Prophet T8, Yamaha PC1000, Carlsbro AD1 Echo* **Technology** *Decillionix DX1 (Apple sound-sampler), DIY Valve Driver*

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At last, E&MM's distinctive new logo is available on top-quality sweatshirts and T-shirts, direct from us at the editorial address. Don't mistake this for inferior promotional clothing; these shirts are beautifully made and superbly printed. There's a choice of colours and you can even decide whether you want the E&MM lettering printed large in the middle of your shirt, or smaller in the top right-hand corner.

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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 do 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.

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Keyboards

ARP ODYSSEY + Sequencer. Home use only, still with original box/manuals, immaculate, many patches, £399 ono. ☎ (0226) 286786 evenings.

ARP ODYSSEY duophonic keyboard, twin oscillators, ring modulator, versatile modulation facilities, many external connections, good cond, £295 ono. ☎ (0705) 475945.

ARP QUARTET polysynth, strings, piano, brass, organ, can mix, £175. Hohner strings piano, self-standing, complete, £225. Dave ☎ (0803) 34878.

ARP QUARTET strings, brass, organ, piano, polysynth. Mint, £250. ☎ Hitchin (0462) 52084.

ARP SOLUS SYNTH £110 ono, no handbook. ☎ 061-860 5464.

CASIO CT202 8-voice, 49 presets, Yamaha MR10 drum m/c, Jen SX1000 c/w leads. All pristine, £300. Nigel ☎ (0226) 715203.

CASIO CT501 keyboard, £200 ono. Moog Rogue mono synth, perfect condition, £150. Mattel drum m/c £40. ☎ Kidderminster (0562) 850407.

CASIO CT1000P c/w hard case and stand, as new £165 for quick sale. Yamaha CS5, £100. ☎ Wolverhampton (0902) 894804.

CASIO CZ101 polyphonic MIDI keyboard, brand new and boxed, £275. ☎ Bath (0225) 319662.

CASIO MT65 keyboard, 20 presets, 2 modulation switches, rhythms, auto-accompaniment, power supply. Excellent condition, £80 ono. ☎ (0905) 60247.

CASIO MT65 keyboard, rhythms galore and quite a bit more! Perfect Xmas gift, immaculate, boxed, only £75. ☎ 01-346 8138.

CASIO MT70 as new, still in box, includes power supply and manuals. RRP £225, sell only £150. ☎ Cardiff (0222) 752652.

CASIO PT30 £28. VL-Tone £12. Eurotec Phaser £12. Sean ☎ Bentham (0468) 62258.

CASIO PT80 keyboard with manuals, ROM cartridge, excellent condition, still under guarantee, only £45. Daniel ☎ 01-699 5354.

CHASE BIT 99 three weeks old, absolutely pristine, read review, £649 or swap for Jupiter 6 and my cash. Tim ☎ (0304) 823685.

CLEF MICRO SYNTH mono, 2VCOs, VCF, EG, VCA, PWM, noise, good bass synth, £100 ono or swaps. John ☎ Liverpool 051-480 2245.

CRUMAR TI ORGANISER portable, drawbars, bass synth, foot pedal, stand. £100, no offers. Steve ☎ 021-449 3015.

DIGISOUND 80 Modular synthesiser, 5-octave keyboard, sequencer, minor repairs needed, £350 ono. Transcendent DPX £250 ono. ☎ Welwyn Garden (0707) 333979.

E&MM SPECTRUM well cased, scares dogs. £120 ono. Casio MT65, auto pilot etc, £80 ono or p/ex for Poly 800. Alex ☎ Cheltenham (0242) 514533.

E&MM SPECTRUM synth, built complete but needs tuning, £90. Nick ☎ Taunton (0823) 81729.

ETI VOCODER £150 ono. Roland SH101 £100, or will swap for anything useful. Paul ☎ (077478) 4335 (keep trying, I work shifts).

EXCHANGE Korg Poly 61 and Yamaha CX5M and cash for either DX7 or Greengate DS3. ☎ (0736) 62040.

FENDER RHODES Stage 88, exc cond, £450. ☎ Bristol (0272) 602883 evenings.

HAMMOND M102 split Leslie cab, Korg Mono/Poly, £850 ono. Will sell synth separately. All vgc. Graham ☎ Bexhill (0424) 224515.

JEN SX1000 monosynth, vgc, £95 ono, or will swap for Korg MS10 or MS20. Graeme ☎ Stirling (0786) 74068.

JEN SX1000 synth plus Yamaha PS2 organ, swap for Roland MC202 and power supply. Tony ☎ (0205) 61173 after 5pm.

KORG MONO/POLY immaculate, £195. Korg DDM110 digital drums, separate outputs, £130. MC202 £120. Yamaha CS01 synth £40. ☎ Salisbury (0722) 337879.

KORG MONO/POLY good condition, home use only, still boxed, £300. Rick ☎ (0722) 53059 after 7.30pm.

KORG MS10 monosynth, immaculate, Clavinet D6, vgc, £165 the pair. Will separate. ☎ Manchester 061-202 2091.

KORG MS10 still boxed, £75. Roland CR5000 CompuRhythm, still boxed, £130. Keith ☎ Crawley (0293) 26674.

KORG PE2000 polyphonic ensemble, with flight case; Mono/Poly 4-VCO synth, very good cond, £280 ono each. ☎ 01-464 4633.

KORG POLYSIX synth, in good cond, has arpeggiator, chorus/phase/ensemble effects. Bargain £385 ovno. Contact Roy ☎ 01-882 0517.

KORG POLYSIX 32 memory, chorus, phase, etc, easy editing, home use only, vgc, £320. ☎ Southampton (0703) 738980.

KORG POLY 800 X-type stand, 50W amp, all 3 months old. Still boxed, hardly used, £450 secures. ☎ 031-336 6287 evenings.

KORG POLY 800 boxed, as new, excellent condition, inc stand, new sounds and power supply, £320. ☎ (031) 445 5440 evenings.

KORG POLY 800 Quick sale! As new, £350. Roland Vocoder Strings, vgc £510. Mark ☎ Meriden (0676) 22989 evenings.

KORG POLY 800 perfect, home use only, £370. ☎ (0602) 604484.

KORG POLY 800 MIDI synth £330. Korg CX3, Hammond Leslie Soundalike, £350. ☎ Brighton (0273) 31643.

MAPLIN 3800 synth in custom cabinet £200. Roland TB303 Bassline £80. Patrick ☎ 01-679 3180.

MOOG ROGUE £120. MC202 £120. Roland TR606 £100. All as new, boxed, home use only. ☎ 01-805 1306.

OBERHEIM OB1 synth, 8 memories, fantastic lead/bass (Mr Hammer), £375. Casio CT201, original poly, 29 realistic presets, beginner's bargain, £125. ☎ (0602) 411185.

OSCAR inc MIDI, home use only, £390. ☎ (0602) 604484.

OSCAR (MIDI), £450. Wasp £60. Clef drum m/c £30. DPX string/piano £120. Patrick ☎ Bristol (0272) 573261.

POLYMOOG synth, just serviced, fully working, good Moog sound, swap for Juno 106, WHY. Terry ☎ 01-388 2206 after 7pm.

PROPHET 5 just serviced by qualified SCI technician, new EPROMs, new deck memories, much more, £900 ono. Brian ☎ Kilbirnie, Scotland (0505) 684220.

ROLAND JUNO 60 polyphonic synth, £500. Boxed, leads, cassettes, comes from a good home. Philip ☎ Plymouth (0752) 668939.

ROLAND JUNO 60 mint cond, one careful owner, genuine reason for sale, can deliver, £465. ☎ (0272) 279184 afternoons/evenings only.

ROLAND JUPITER 6 swap for Drumtraks, Drumulator, Oberheim DX, MXR Drumcomputer or offers, cash. Glyn ☎ Reading (0734) 343819.

ROLAND JX3P vgc, boxed, £450. Boss DR110 boxed £50. Home use only. Rina ☎ Kingston, Surrey 01-546 5933.

ROLAND RS09 strings, organ, mixer, etc, £200; SCI Pro One £180; both good cond. Two small cabs, 1×12, 125W celest & piezos £60. Brian ☎ 061-652 9586.

ROLAND SH09 monophonic synth, good cond £100. Mike ☎ Frodsham, Cheshire (0928) 32979.

ROLAND SH09 monosynth, immaculate, home use only, £95. ☎ Bath (0225) 319662.

ROLAND SH09 immaculate, ideal first synth, £85. Colin ☎ Peterboro (0733) 78726.

ROLAND SH101 still under guarantee, also PSU, £140. ☎ East Grinstead (0342) 313360 after 7pm.

ROLAND SH101 with hand grip and power supply, six months old, still boxed, £140. ☎ (0676) 42114.

ROLAND SYSTEM 100M and MC4, 15 modules, 3 racks and over 100 patch leads, £999. ☎ Bath (0225) 319662.

ROLAND SYSTEM 100M modular synthesiser, five modules, rack and large keyboard, £500. ☎ 01-889 1417.

ROLAND SYSTEM 100 modular/patchable synthesiser, keyboard unit and expander, good condition, £225. ☎ 01-533 0827.

ROLAND VK1 organ, £185. Roland SH09 + CSQ100 £200. Elka 610 strings/piano/clavichord, £200. All excellent. Steve ☎ Sheffield (0742) 399058.

SCI PRO ONE with smart Rod Argent f/c, £210 ono. Vesta Fire RV1 reverb £125. ☎ 01-894 0922.

SIEL DK80 and expander, both less than 10 hours use, £410 and £210 or £600 together. ☎ Newbury (0635) 297345.

SIEL DK80 ROM pack number one, half price or less, £15 ono. ☎ 01-556 5134 evenings/weekends (East London).

SWAP YAMAHA SK20 polysynth for reel-to-reel tape deck. vgc, with case. ☎ Steve (0782) 262286 evenings.

TECHNICS SKX150 built-in chord computer and PCM drums plus volume pedal and cover. Brian ☎ Shawbury (0939) 251054.

TRANSCENDENT 2000 synths, built, tested, perfect, £75 each. The Kit, custom programmer, Syntoms, Synclap, £100. Dynamix 6:2, immaculate £125 ono. ☎ (0353) 87498.

TRANSCENDENT DPX strings/brass and piano, added reverb and swell pedal, £125 ono. ☎ St Albans (0727) 55005.

WASP SYNTH with case & Commodore 64 interface, Audition 30W amp, £100. Will split. ☎ Basildon (0268) 284591 evenings or weekends.

YAMAHA CP20 electric piano, weighted action, self-contained case, good cond, £350 ono. ☎ Ian (031) 663 7015.

YAMAHA CS70M £425. ☎ Kidlington, Oxford (08675) 4032.

YAMAHA DX7 with custom flightcase, ROMs etc, £1100 ono. ☎ (0772) 719076.

YAMAHA DX7 mint, home use only, inc flight case, volume + sustain + portamento pedals, manual. £950. Jon ☎ Walderslade, Kent (0634) 62892.

YAMAHA MK100 programmable home keyboard, boxed as new £200 ono. Simon ☎ 01-847 4708 after 5pm.

YAMAHA MK100 vgc, programmable rhythm, bass, chord variation, multi-menu. Bargain £180. James ☎ Chandler's Ford (04215) 65100 after 4pm.

YAMAHA MK100 rhythms, mini drum m/c, synth section. Superb condition, boxed, £199. ☎ York (0904) 425674 after 6pm.

YAMAHA PS20 portable keyboard. £200. Casio VL-Tone £15. ☎ Doncaster (0302) 61672 after 6pm.

YAMAHA PS55 stand, mains adaptor, volume and sustain pedals, boxed and mint cond. Total £575 new, sell £450 ono. Andrew ☎ 01-356 6826.

YAMAHA YC45D portable keyboard, twin manuals, bass pedals, touch sensitive, vgc, £350 ono, including stand and case. ☎ Maidstone (0622) 685866 evenings.

YAMAHA YK01 small keyboard for CX5M, £50 ono. ☎ 061-834 6633 X218.

Drums

BÖHM Digital Drums, fully programmable, the ultimate, cost over £1000, as new £500. ☎ Chester (0244) 674258.

BOSS DR110 drum m/c, vgc, £100 ono. Dana ☎ 01-969 6998.

BOSS DR110 £80. Washburn analogue echo pedal, £50 ono. Both excellent condition. Jason ☎ (0222) 830656 after 5.30pm.

BOSS DR110 drum m/c £100 ono. Dana ☎ 01-969 6998.

BOSS DR55 drum m/c, excellent condition, £30. Soundmaster Stix, single sound

outputs £35. £60 for both. Peter ☎ 01-579 6609 evenings.

CLEF BAND BOX programmable bass, home use only, £250 ono. J Williamson, 49 Netherhall Road, Leicester LE5 1DP.

DRUMULATOR with Syco Systems Simmons interface and crash/ride cymbal ZIF socket fitted, £545 ono. Steve ☎ (0984) 31549.

KORG DDM110 and DDM220, boxed, guaranteed, p/x Roland TR909. ☎ Ware (0920) 3149 anytime.

KORG DDM110 digital drums, as new, still boxed, £155. Neal ☎ (07292) 2504.

KORG DDM110 plus adaptor, real bargain, £135. Casio 1000P synth, £130. Trucker 50W guitar combo, £85. Pete ☎ (08832) 2282.

KORG DDM220 never used, brand new, £175 ono. Roland MC202 £100. Both £260, exchange delay unit, guitar, WHY. ☎ Kettering (0536) 791072.

ROLAND TR606 drum m/c, including mains adaptor, manuals etc. Perfect cond, £115. ☎ Reading (0734) 866762.

ROLAND TR606 drum m/c with individual outputs, exc cond, boxed, £100. ☎ 01-300 0827.

ROLAND TR606 separate outputs, carrying case, £100 ono, bargain. ☎ 01-631 0472 daytime (leave message if necessary).

ROLAND TR707 plus M64C memory cartridge, both items as new, £430. ☎ Reading (0734) 599056.

SCI DRUMTRAKS £520; Yamaha DX9 £510; MC202 £95; MXR Drum Computer (tunable) £475; JSQ60 £95; Roland TR808 £220. ☎ (06284) 74752.

SIMMONS SDS200 twin toms, red, as new £260 ono. ☎ Reading (0734) 47715 daytime.

SIMMONS SDS9 black, one month old, immaculate, £1100 ono. ☎ (051) 632 3505.

THE KIT boxed, as new, only £50. Consider swaps, Accessit gate, Boss effects, etc, can deliver London area. ☎ 01-654 7577.

YAMAHA RX11 drum m/c, as new, boxed, £570 ono. DOD mains-operated echo unit, mint, £90 ono. ☎ Carterton, nr Oxford (0993) 841586.

YAMAHA RX21 £220. Casio CZ101, £275. Both brand new, hardly used, home use only. ☎ London 01-650 8731.

Sequencers

ROLAND BASSLINE as new, boxed, £75. ☎ 01-868 0331.

ROLAND BASSLINE £100. Roland TR606 separate outputs, £100. Tascam MM20 6:2 mixer, meterbridge, PE20 EQ, £150. ☎ (0285) 800632.

YAMAHA QX7 polyphonic MIDI sequencer plus Roland MM4 MIDI Thru Box. Both hardly used, £375. Geoff ☎ (0773) 760654.

Sampling

AKAI S612 MIDI keyboard sampler, 6-note polyphonic, 8-second sampling, boxed, 4 weeks old, £700 ono. Nick ☎ (0272) 731947.

Computing

ACORN MUSIC 500 £140, ATPL Keyboard £95, both as new including software. BBC B with Opus disk drive £345. ☎ (0502) 741238.

ACORN MUSIC 500 with ATPL keyboard and software, mint, £240. ☎ (0502) 741238.

ALPHA SYNTAURI system, Decillionix Sound Sampling card, updated software includes 8-track sequencer, 8 keyboard splits, vgc. Barry Woods ☎ (08494) 53692.

APPLE MOUNTAIN Music System £100. ☎ London 01-675 8720, Sunday only.

BBC B MICRO plus modem, software on ROM, £250. Ted ☎ Kidlington nr Oxford (03675) 77281

JELLINGHAUS 12-TRACK Recording Studio, Sequence Chain and interface for CBM64, £99. ☎ 061-998 3494.

JELLINGHAUS MIDI INTERFACE with 8-track sequencing software (Sinclair Spectrum). First offer around £55 secures. Delivery included. Mark ☎ (0327) 61128.

ORIC SPEECH SYNTH (kit already assembled) in good working order plus instructions for £12. Joel ☎ 01-699 5354.

ROLAND MPU401 with IBM interface and software, £80. ☎ (0268) 691180.

SIEL MIDI INTERFACE plus Live Sequencer & Multitrack Composer programs (unused), £100. Jane ☎ 021-440 1168.

SWAP YAMAHA CX5M with keyboard and ROMs for Casio CZ1000 or SIEL DK80 or p/x for Casio CZ101. Yatin ☎ (0203) 22740.

THE MIDI MICRO! CBM64, disk drive, cassette, software, books, £380. Casio CT405 £160. 75W MOSFET amp £50. ☎ (04302) 3204.

YAMAHA CX5M large keyboard, composer and voice cartridges, £550. Korg DDM110 drum m/c £150. Both under guarantee. ☎ Peterborough (0733) 73184.

Recording

ACES 19" RACK spring reverb £50. Roland TB303 £80, plus postage. Bob Ellis ☎ (0437) 4571 X445 after 6pm.

AKAI 4000DB (sound on sound), £90; Roland TR909 £325; Jen SX1000 £70; Ibanez Equaliser £25; SCI MAX £325. ☎ (06284) 74752.

AKG C451E condenser mic, CK1 cardioid capsule, two available £80, each very clean sound, perfect, bargain. Mick ☎ 01-441 9298.

ALICE 828 MIXER very quiet and fully comprehensive, for recording or live, pro quality, in perfect condition, £350. ☎ 01-582 9254.

BOSS DE200 DDL, perfect, £200. ☎ 01-985 2739.

BOSS KM400 4-channel mixer unit, boxed, as new, £40. ☎ Chester (0244) 674258.

CALREC high-quality CM654 capacitor microphones, set of six with case, complete PSUs, leads, only £275. Midlands ☎ (0789) 778343.

FOSTEX MN15 mixer, boxed, like new, bargain £25. Colin ☎ Peterboro (0733) 78726.

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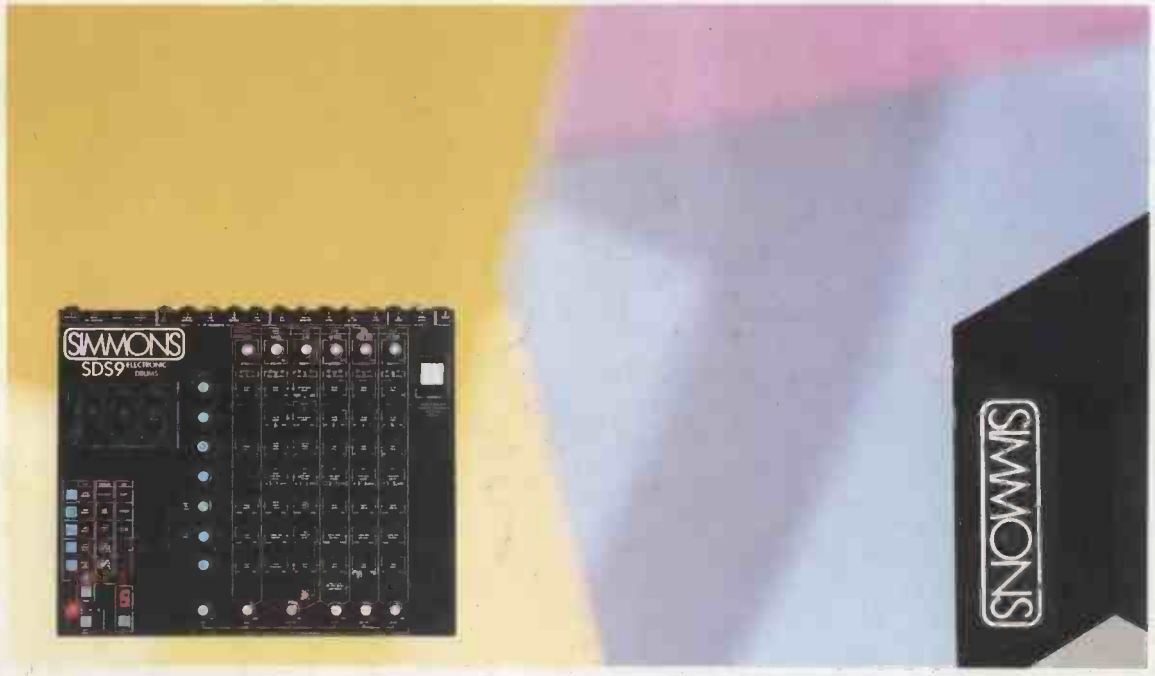

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